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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



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

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

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

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THE BUILDER

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AT THE PORTAL.

What can we bring, who at the portal stand
 Of this new century, and far behind
 See the long highway of the Ages lined
 With structures reared by Man's symbolic hand—
 Egypt's dim Temples shadow the hot sand,
 Mystic as Fate; the Greek's æsthetic mind
 Expressed in clear columnar grace we find,
 And Faith's tall spires point to a heavenly land:
 What can we bring, who, fallen on empty days,
 Unsettled aims, and hard mechanic hours,
 Have chased a dying art through devious ways?
 Love, Work, and Hope—these three may still be ours;
 Through these the fallen fane we yet may raise,
 Where the great city of the future towers.

Retrospect and Prospect.

ALTHOUGH our larger divisions of time are arbitrary, or at all events only governed by considerations of arithmetical convenience in reckoning, there must nevertheless be a feeling of a certain solemnity and importance in the entrance upon a new cycle of a hundred years. For one thing, it is, unless in some few very exceptional cases of longevity, a unique event in the life of every one. When we wish each other "a happy new year," we make a mental forecast of the whole year and its possible events. But we can wish no one, in the same sense, "a happy new century." No one old enough to read these words will ever see another dawn of a century; whatever reflections we have to make on the situation must be made once and for all.

Since the lapse of one hundred years is a time long enough for great changes to take place in the intellectual, moral, and social conditions of life—changes sufficiently important to be appreciated in our retrospective view of history, we have been accustomed, by way of grouping our historic ideas, to think of each century as having special characteristics of its own, as representing certain tendencies in thought, in art, in social polity, not exactly contemporaneous with the century, but so far contained within its limits as to be appropriately associated with it. Thus, when we speak of eighteenth-century literature, we mean something more than a mere date; we think of certain marked characteristics which belong to the literature of that period. And in architecture these century characteristics are perhaps even more marked. We all have a perfectly clear definition before our minds when we speak of the architecture of the thirteenth, fourteenth, or fifteenth century. But how shall we characterise the architecture of the nineteenth century? And what are we to expect will be its development in the twentieth?

The future historian of English architecture will probably, we think, characterise the nineteenth century more especially as the century of the Gothic revival. Although it has run its course some time ago, and gone the way of all revivals, no other movement in architecture, during the epoch in question, has lasted so long, has been the object of such general and widespread enthusiasm, and has left such a large visible impress on the architecture of this country. It belongs to the century, in fact, more fully than would appear from the mere dates of the earliest churches erected under its influence; for it was in the air, so to speak, before it took visible shape in any important buildings. Rickman's celebrated publication, the first methodical attempt to classify the styles of mediæval architecture, dates from 1819, and was the result of an already existing feeling that our national mediæval architecture had been unduly neglected. Nor have we cause to be ashamed of the Gothic revival as the principal development of the outgoing century. We can see now that it was a mistake—an illu-

sion; but it was a noble error after all, the product of a genuine enthusiasm, and it had an important and lasting effect in awakening a new interest in architecture, and removing it from the category of a respectable profession to that of an art to be passionately loved and pursued for its own sake and not for mere lucre. And let it not be forgotten that it has left us as a legacy the finest, most picturesque, and most original public building of modern times.

The nineteenth century may also be remembered in a less satisfactory way, architecturally, as the century of restoration. This was a movement linked with the Gothic revival, and it must be admitted a much more questionable one. The practice of restoration has obliterated, since the beginning of the century, the genuine value, as examples of ancient architecture, of many of our churches and some of our cathedrals; and, unhappily, the mischief is absolutely irretrievable. We must not judge the architects of the last generation, however, too hardly in this matter. They did not, at all events, disfigure the ancient cathedrals, as some of their predecessors in the pre-revival generation did; they brought learning and care to their work; and in the rearranging and decorating of the often dilapidated and untidy interiors of cathedrals and churches they, and those who commissioned them, carried out a work which was really desirable and even necessary; and if some of those who now rail against every kind of restoration could be suddenly transported back into one of our cathedral interiors as it was in its unkempt and dingy condition before the restoration era, they would perhaps unexpectedly realise that there are two sides to the question, and that the buildings are now in a far more decent and seemly condition for public worship than they were at the commencement of the century. The misfortune is that, with the best intentions, the restorers, acting at the time with the approval of every one, carried out an immense amount of refacing of ancient architecture, under the idea of restoring its pristine beauty, before it was realised that this was an impossible effort, that the imitation was of no value as a substitute for the original. By the time this was realised, the mischief was done, and could not be undone; and this experience ought at all events to be a lesson as to too much meddling with old buildings in the future. It is fair to ourselves, too, to remember that the English are not the only or the worst sinners in this respect. The French have carried out restoration in a systematic and drastic manner beyond what the most enthusiastic of our restorers have ventured upon; they consider the promotion of such work part of the business of the Government, and they are still carrying it on, and still unrepentant and unconverted.

If we turn from the æsthetic to the practical side of civil architecture, there can be no doubt that in that connexion the century just closed will be remembered especially as the century of sanitation. At the commencement of the century we knew and apparently cared nothing about sanitation beyond a general notion that houses should be drained somehow or other. At the close of the century we seem to know all about it—about drainage and sanitary construction at all events; little remains except, in the words of the old hymn, to "always

practise what we know." In the more vague science of ventilation, if it can as yet be called a science, we seem to be still in a partially experimental stage; though as long as mechanical power is made use of we have now the means of securing perfect ventilation of a large building; it has been done with marked success in some instances, and might be done in all cases in which there is a *dignus vindicæ nodus* for keeping up a mechanical driving power. The fact is there is really no science of ventilation apart from mechanical power or special application of heat; without those aids we can only provide facilities for ventilation, without ensuring certainty. The contrary idea has only been fostered by the makers and exploiters of various ventilating nostrums—"extractors" which do not extract, and which, with the new century, let us hope, will go the way of other vain inventions.

The architectural problems which are in process of consideration, and are handed over to the new century for solution, appear to be three—viz., architectural education; the combination of the decorative arts with architecture; and the housing of the working classes. The latter subject, which has been much discussed during the last few years, may be thought to be as much a social and financial as a building problem; but the question of the best planning, the best situation, and the best construction for such a class of buildings, so as to combine economy with sanitary conditions and with as much attractiveness as possible, is an important part of the problem, and one about which we are still far from any final decision, though the present tendency seems to be towards the idea of suburban dwellings and cheap communication. Probably some experiments will have to be made, even at a loss, and some experience gained, before we arrive at a final settlement of the question.

Architectural education has never been so much discussed and considered in this country as at present, though we are still in a transition stage in regard to it. What is evident, however, is that there is an increasing desire to substitute a separate and systematised education for the mere office routine which formerly constituted the mainspring of architectural training in this country. With some, the predominant idea is a training in the craftsmanship of building, leaving the element of architectural design to evolve itself from this basis. With others the ideal is an intellectual training in the art of architectural design, analogous to that given by the *Ecole des Beaux-Arts* in France. The latter seems likely to prove the true solution of the problem. Architecture in modern times is an intellectual conception, to which mere building craft is subordinate. It is to the development of this power of intellectual conception that the future of architectural education must tend.

The general prospect for Art in 1900 is far more promising than it was in 1800. There is enthusiasm where there was then indifference; knowledge where there was then ignorance. We have every reason to hope that the Twentieth Century may prove a greater artistic era than the Nineteenth. We have been living through what has been admittedly an epoch of architectural imitations. Let us endeavour to render the coming century an epoch of new and original creation in architecture.



SIR CHARLES BARRY, R.A.

(From a Crayon Portrait in the possession of Sir J. Wolfe Barry.)

THE ARCHITECTURAL GENIUS OF SIR CHARLES BARRY.

BY THE EDITOR.

SO much is architectural taste at present under the influence of the fashion of liking for this or that character of detail, that we seem in danger of forgetting that architectural genius is really shown not so much in the details of a building as in its general conception as a whole idea, of which the plan is the basis, and the general grouping the development and expression. Refinement in detail is an indication of culture and scholarly feeling, and there are many great productions of architecture in which the detail will bear examination as much as the total effect; but it is, after all, the general conception which stamps a man as a great or a mediocre architect. We can recognise this in regard to Wren; for while we all admit the general grandeur and beauty of St. Paul's, and the extraordinary variety of invention displayed in Wren's smaller churches—while we count Wren as unquestionably one of our greatest architects, a man with in-born genius for the art of building—few people would in the present day deny that the details of his buildings are

too often poor and commonplace, as decorative work, abounding in mere repetitions of *rococo* ornament, the introduction of which can hardly come properly under the definition of design; and indeed it seems doubtful whether the detail of a great deal of Wren's work really owes anything to his hand at all, and is not merely the almost mechanical application, by artisans, of the style of carving and ornament which they were in the habit of carrying out indiscriminately on every building of the day.

Yet we recognise Wren as a great architect; his fame is established; he is taken for what he was; his works have now become ancient buildings, and are regarded without any reference to the artistic fashions of to-day. How is it that Sir Charles Barry, whose sense of refinement in detail was far superior to Wren's, and who in grasp of plan and architectural conception was at least his equal, is hardly thought or spoken of among the younger generation of architects of the present day? The reason (though a poor one) we take to be that, as an architect of the modern period, he is regarded as representing a phase of architectural taste which has been superseded. He belonged to a period

before the idea of the union of the arts and crafts had come into being; he designed buildings as "a professional architect" on the old lines; he was an "eclectic" in regard to style, which is now an unpardonable sin, but was in his days regarded almost as a virtue; he had a leaning towards symmetrical effect and careful detail which appears, no doubt, formal and antiquated in the eyes of a generation who are given up to the search of the picturesque, or even the eccentric, in architectural design. But it is a very narrow school of architectural criticism which considers a building only in reference to its agreement with the special likings and fancies of our own day and our own artistic circle.

The fact is, that in all the essential qualities which go to make that very *rara avis*, the in-born architect, Inigo Jones, Wren, and Barry are the three most remarkable figures in English architecture since the Renaissance; and if Inigo Jones, in virtue of a certain fiery quality of genius, may be considered to have stood above the other two, there can be no doubt that Barry was fully the equal of Wren, and the only English architect since his day who can be classed with him, and who has exhibited

something of the same kind of innate architectural insight, as it may be called, into the problems of architectural design. For what is it that especially marks the in-born architect? Not the power of making artistic drawings, nor yet of inventing picturesque and novel detail. It is the power of grasping the whole possibilities of a site and of a plan; of seeing intuitively what can be done with a building, and of understanding how to combine practical requirements with effective architectural treatment. And in these qualities, and in their exercise on a great scale, Barry is really the only person who can be rightly regarded as being a successor to Wren. Neither of them were sentimental architects; but then architecture is not all sentiment; it is a practical art, based on practical requirements; an important truth which neither Wren nor Barry ever lost sight of for a moment.

There was this difference between the two, however, that while Wren was, fortunately for us, drawn into the practice of architecture without being originally intended for it, and brought into it almost by the force of circumstances, Barry intended his career from the first, and went into regular training for it at the early age of fifteen, though in an office where it appears probable that he saw little except of surveying work and the business side of the profession generally. This business side, however, he studied accurately and industriously; "lists of prices, calculations of dimensions; methods of measuring and valuation, crowd his notebook, side by side with studies from 'Chambers's Architecture,' and sketches of such details and ornaments as struck his own fancy."*

It was probably owing to this familiarity with the dry business side of the profession in his pupilage days, that Barry acquired the practical view of architecture which he retained all his life. He was not one of the "art architects" who think specification and measuring beneath them; on the contrary, his biographer testifies that he rather had a contempt for architects who thought themselves above those practical subjects. Perhaps it was the best thing for him that he got his training in an office of that class; for his artistic tastes were innate and needed no external stimulus, and in the office routine he acquired what he might have neglected otherwise. Unlike Wren, he was a beautiful draughtsman; and, again unlike Wren, but like many successful modern architects, he precluded his career of architectural practice by an assiduous course of sketching. He was fortunate in getting some substantial assistance, just when he needed it, in carrying out his sketching tour further than he might otherwise have been able to do; for in 1818, just as he was feeling that considerations of economy must bring his tour to a close, a wealthy gentleman, Mr. David Baillie, whom he had met at Athens, offered to pay Barry at the rate of 200*l.* a year to accompany him and sketch for him on a tour in the East, the artist to be allowed to keep copies of the sketches. This tour was the occasion of the production of a large number of beautiful sketches, several portfolios of which have been secured again by his family from the inheritors of Mr. Baillie. Among these is the admirable,

* "Life and Works of Sir Charles Barry"; by the Rev. Canon Barry (now Bishop Barry).

and carefully executed drawing of Karnae, now in the possession of Sir J. Wolfe Barry, who has kindly lent it to us for reproduction in this issue (see lithograph). This is a masterly piece of architectural sketching, notable especially for its clearness and firmness of execution and for the care and evident truth with which the shadows are put in. Considering the number and the exceedingly careful and neat execution of the foreign sketches of this period (quite typically an *architect's* sketches), it is evident that Barry, even at this period and on this partially holiday expedition of sketching, must have been a most indefatigable worker.

Considering the class of buildings with which Barry's name is now chiefly connected—mansions, clubs, and the Houses of Parliament—it seems rather curious that his professional career commenced mainly with church-building. He gained the commission for St. Peter's, Brighton, in a competition in 1823, and regarded this as being, up to then, "the proudest day of his existence," and the entrance, as he promised his wife, "to a brilliant career." The brilliant career undoubtedly followed, but not in church-building; though this success in a competition which was rather strongly contested may, no doubt, have aided in bringing him into notice. It is not generally known, probably, that the melancholy regions of Islington and Holloway boast of three churches built from Barry's designs in 1826-7, viz., St. John's, Holloway (at the west side of Holloway-road), St. Paul's, Balls Pond (at the junction of Ball's Pond and Essex-roads), and Holy Trinity, Cloudeley-square, Islington. The first-named I have not seen; the other two are plain brick Gothic-revival churches in the rather late Gothic style then in vogue, with stone dressings and window tracery; unless one knew their authorship they would certainly not attract notice now; but there is a certain dignity and sense of proportion in the Cloudeley-square church (the larger of the two) which, when we know the work to be Barry's, we can recognise as characteristic of him. The three churches were built as a commission from the Rev. D. Wilson, then Rector of Islington, and whose name was afterwards widely known as Bishop of Calcutta.

Barry's general reputation as an architect was first attained in connexion with the Travellers' Club, his design for which was selected in 1823, in a limited competition. It is worth notice that in choosing a severe Italian style for this building, he depended for success entirely on the refined treatment of a very simple and unassuming design; and though he was conscious of the disadvantage which this simplicity of design might place him under in a competition—he himself doubted of his success because he thought the building would be considered "too plain"—yet this did not influence him in any way in departing from his architectural principles by endeavouring to produce something which might be more popularly attractive. This is typical of his whole career. Barry never for a moment allowed himself to be in any way sensational or eccentric in design; he was always for what was best, not for what might be popular; he always confined himself within the lines of dignity and simplicity in design and grouping, aided by a carefully-studied refinement

in detail. We see these qualities again exemplified in the Gothic design for the Birmingham Grammar School, made in 1833. This, as a modern Gothic building, shows a great advance on the rather thin and timid treatment of the Islington churches before referred to; there is a much greater breadth and massiveness about it; and though it shows an exceedingly simple adaptation of the elements of late Gothic architecture, it is still, in spite of the changes of taste in regard to revived Gothic, a building which will always give pleasure and satisfaction from its quality of dignity, repose, and harmonious proportions. The Travellers' Club shows just the same qualities in a totally different style of architecture. Compared with the more showy and restless character of much recent architecture, it is a building that might be passed over with little remark by many an observer who did not know its history; but it is one of which every detail will bear examination, and which fulfils the true ideal of an English gentleman's club, totally free from anything approaching to showiness or vulgarity. This quality is apparent again in the interior, in the unostentatious treatment of the main staircase, with its simple wooden balustrade; a marked contrast to some of the sumptuous staircases of more recent clubs, where the lavish use of costly marbles and gilding displays rather the taste of the *nouveau riches*. In the Pall Mall front of the club Barry regretted the necessity, owing to limitations of space, of planning the building so as to have the entrance at the end instead of in the centre of the façade; his desire for symmetry, and dignity would have led him to prefer a central entrance, but it would have divided up the plan too much. The garden façade to the south, which is less obvious and less noticed, is the more effective of the two; and it is noticeable how suitably a rather more playful treatment is given to this façade, by the grouping of the windows, while the street façade preserves the true Italian severity of equally spaced windows. In the interior of the house, which gives a much greater idea of spaciousness than the modest exterior would lead one to expect, there are various fine points in the treatment of the principal rooms; the dining-room, for instance, has the strongly marked cornice returned across the room at about ten feet from the fireplace end, while the latter portion is slightly separated from the rest of the room by a rather lower ceiling and this stoppage of the cornice, so as to give the impression of a separate alcove or ingle-nook without limiting the floor-space. In the library a charming effect is produced by the architectural pedestals and columns projected into the room near each end, leaving it as a large centre room with smaller ante-rooms at each end, which, besides adding to the architectural effect of the room, give the sense of seclusion suitable for quiet reading. We have to thank the committee of the club for their courtesy in allowing us to have a photograph taken of the interior of the library. The view does not show the full effect of the room as seen from one end, with the two sets of columns; but it was impossible to include the nearer ones in the foreground without too much distortion of the perspective.

Barry seems to have settled in his mind that this severe Italian style, with its large



Copy of Sir C. Barry's First Elevation Study for the Houses of Parliament Competition. (The same size as the original.)



Facsimile of an Original Pencil Sketch by Sir C. Barry.

of all to the grasp of Barry's architectural genius, and it was of them that I was mainly thinking in the opening remarks in this paper in regard to the superior importance of conception over mere detail in our estimate of an architect. People may say they do not like Barry's style of detail, or think his taste in this respect *passé*; but can any one question the architectural genius of a man who could conceive, and illustrate so thoroughly, such a grand scheme as this? That is where the hand of a great architect comes in; in the power to grasp a great idea for the architectural treatment of a whole group of buildings. The drawings explain themselves sufficiently; we may point out that the idea for the Government offices was to combine them all in one great building, with its south front facing the whole length of Great George-street, and the east front occupying the whole of Parliament-street and Whitehall up to the Horse Guards (the present Treasury buildings' front being incorporated in the new building); the building being divided up into court-yards each of which, with its surrounding buildings, was to be devoted to one of the Government departments, all of which would thus be in connexion with each other, and in contiguity to the Houses of Parliament. In looking at the sheet of sections and elevations showing the whole intended disposition of the buildings one is irresistibly reminded of Wren; it is such a scheme as one could imagine him laying out, though he would never have illustrated it so

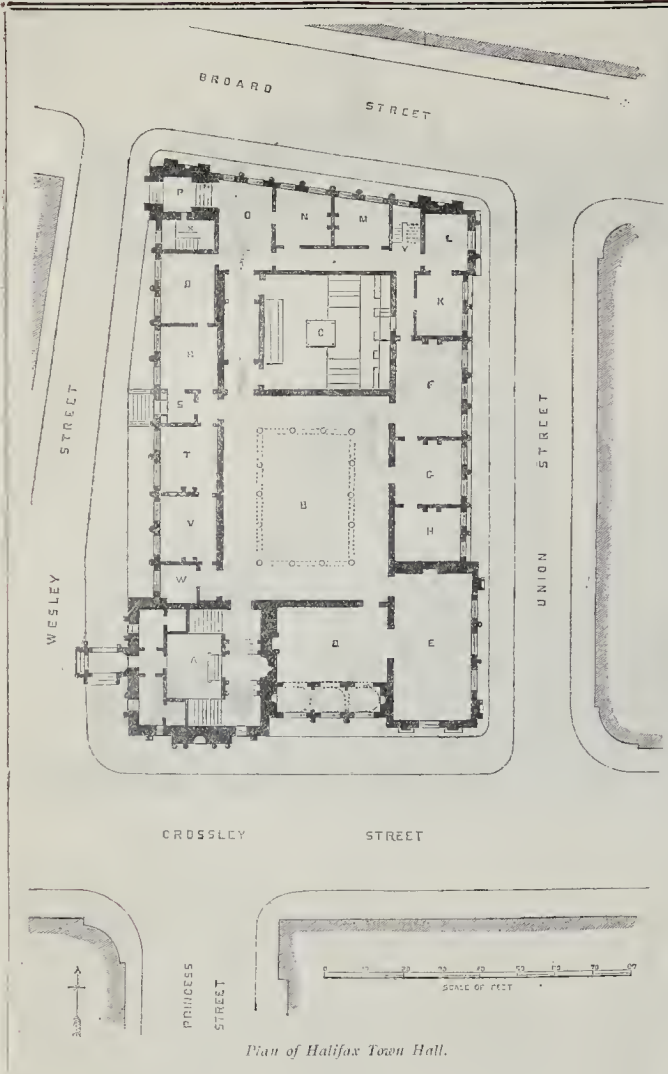
finely. It is melancholy to look at this design now, and to think that for want of adopting it when a great architect proposed it, we are now building Government buildings piecemeal on isolated and inadequate sites, and have lost irretrievably the whole architectural and administrative value of concentration. It may be mentioned, as characteristic of the man, that in the large elevation Barry, besides making the drawing, wrote out the whole of the long description in printed characters, between the two plans, with his own hand*; a kind of thing that most men leave to a clerk to do from their rough draft. But Barry's enthusiasm for work, in the interests of his beloved architecture, was untiring.

To Sir Charles Barry's country mansion-houses a separate article might well be devoted, and I have left myself no space here for more than a general reference to his masterly hand in remodelling an old house and adding to its dignity by new approaches, glorious flights of steps, fountain courts, and so on. It does not appear that Barry had any opportunity of carrying out a country mansion of the largest class as an entirely new work; but his alterations and remodelling of some great mansions, Trentham Hall especially, were so important as practically to make new buildings of them. And that typical faculty of a true architect, an eye for seeing how to take advantage of circumstances, was never better shown than in these extensions and

alterations. A series of his remodelled plans and elevations of large houses, together with the plan and elevation as previously existing, would form a most useful study, but it would probably be rather difficult to get the materials for it.

The last building carried out from Sir Charles Barry's design, the Town Hall of Halifax, I had long admired on paper, but only rather recently found opportunity, when in the neighbourhood of Halifax, to see the building itself. The effect of tower and spire, so Gothic in feeling though Classic in actual detail, was far more impressive than I had even expected. The plan (given on page 3) shows how characteristically careful Barry was, in placing the building on the site, to arrange that the centre line of the tower should be axial with the centre line of the street leading up to it. It is the aspect of this tower seen by itself as you come up Princess-street to it, which makes the real effect of the building; it is not, however, a very easy position to make a drawing from. Mr. Monk's view, taken from an angle position, gives the design accurately, but its finest effect is as seen from the centre of the street leading up to it. The building was actually carried out by Mr. E. M. Barry, after his father's death, and he altered it in one respect by raising the roof of the main building, so as to render it a portion of the design, Barry himself having intended to conceal the roof. But in other respects the exterior conforms mainly to Barry's original sketches, which are preserved in the Sur-

* I had this from the late Mr. Charles Barry.



veyor's department of the Halifax Corporation. As usual, Barry kept his main staircase in a separate position, so as to leave the centre court complete and unbroken; the staircase occupies the ground stage of the tower, and though on a small scale, is treated in a very dignified manner. A view of it is given, as this building has not been much illustrated.

The life of Sir Charles Barry is a highly instructive one in the example it affords of untiring pains in studying and perfecting his designs in every detail. Any reader can see, from the illustration given above, how inferior was the first conception of the Houses of Parliament compared with what it ultimately became when completed; and, as we have seen, this fine development of the original idea was not attained without persevering labour and the rejection of a number of successive designs as unsatisfactory. It was the same with the detail, the mouldings especially. It was told me many years ago, by one who remembered him, that it was Barry's habit, after profiling the mouldings for a building full size, to make very

careful reductions of their lines to scale, on an inch or half-inch scale elevation, to judge how they assorted with the general proportions of the elevation. In fact no labour was too much for him in perfecting his ideal of a building; and, as has been indicated, he did with his own hands what many would leave to an assistant draughtsman. In this as in his more important qualities—in his grasp of an architectural problem as a whole, and his intuitive perception of the relation between plan and design, he was a true and as one may say a born architect, of whom England may well be proud.

H. HEATHCOTE STATHAM.

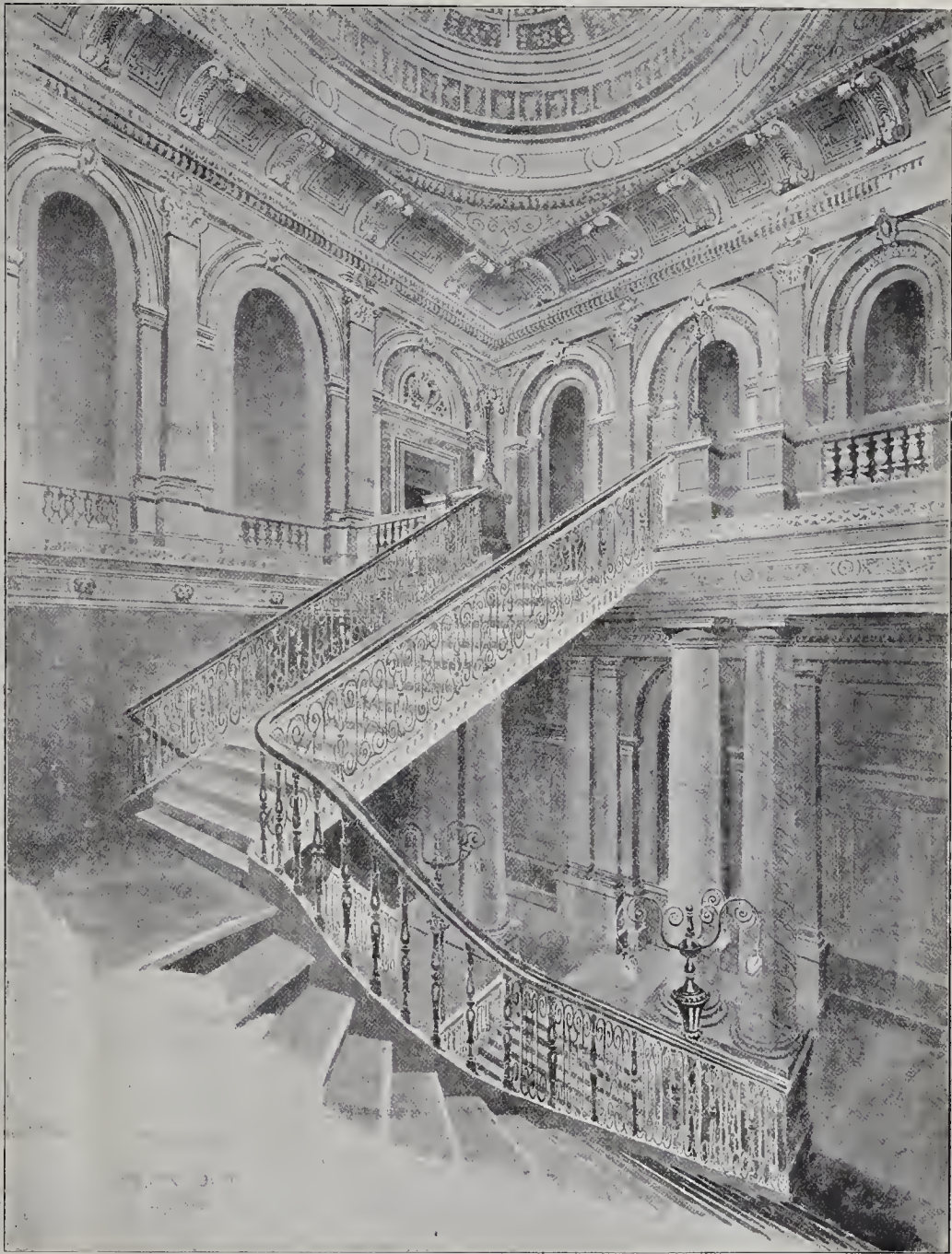
NOTES.

As usual, we look in vain in the New Year's list of official honours for any recognition of architecture or any other art, unless we are to regard the conferring of a "C.B." on Colonel Plunkett, the Director of the Science and Art Department at Dublin, as an honour conferred on art. It appears that an admini-

strating official can be recognised in connexion with an Art Department, but not an artist. A well-known large contractor, Mr. John Aird, receives a baronetcy; but architects, apparently, are not worth any such recognition. It is a pity that those who arrange these lists cannot turn their eyes for a moment to France, and take example thence. They will find, if they take the trouble to inquire, that no distribution of official honours takes place in France, on any public occasion, without a considerable portion of these titular honours going to artists, and to architects, on the whole, more than to any other group of artists. But to the mind of the English Court official an architect is, as a "paramour" was to Bottom's colleagues, "a thing of nought."

A PRELIMINARY Report was issued in November by the Commission appointed by the President of the United States to determine "the most feasible and practicable route across the American Isthmus for a maritime canal between the Atlantic and Pacific Oceans, together with the cost of construction of the same and placing it under the control, management, and ownership of the United States." The Commission was divided amongst five committees, severally authorised to investigate the following subjects:—(1) The Nicaragua route, (2) the Panama route, (3) other possible routes, (4) the industrial, commercial, and military value of an interoceanic canal, (5) rights, privileges, and franchises. That the decision should be in favour of the Nicaragua route will probably perplex those who approach the matter from a purely engineering standpoint. The technical press of the United States has always recognised the undesirable character of the Nicaragua scheme, and early last year an influential engineering journal described it as "egregious folly." Even the report of the Commission does not anywhere recommend the Nicaragua route as superior to the Panama line. On the contrary, it makes clear the following disadvantages:—(1) That the Nicaragua scheme will cost 9,000,000*l.* more than the rival undertaking. (2) That the length of the Nicaragua Canal will be 186 miles, as compared with 43 miles in the case of the Panama Canal. (3) That the time occupied in traversing the former route will be thirty-three hours, as against twelve hours for the latter. As a sort of set-off, it is suggested that the cost of acquiring the rights of the Panama Canal might bring the total expenditure up to the amount involved in the Nicaragua scheme, but as no indication as to the purchase-money has been given by the French Company, it appears that this assumption of the Commission is purely theoretical. Until the full text of the final report is available, it would be premature to discuss the accuracy of the conclusions which have been formed, but it seems certain at the present stage that they have been influenced by political rather than by commercial and engineering considerations.

Two schemes have lately been discussed by the American Society of Civil Engineers—the first relating to a barge canal, and the second to a ship canal, from Buffalo to New York. It is not likely that a barge canal



The Staircase: Halifax Town Hall.

would provide the facilities now required. Since 1880 traffic on the Erie Canal has fallen 50 per cent, whilst railroad traffic has risen nearly 150 per cent, and the Canadian canals have entirely failed to divert commerce from the lake and railway lines. The only possible way in which a barge canal could successfully compete with other means of transport would be by the organisation of

companies for working fleets of lake steamers and canal barges in conjunction, so that through bills of lading might be issued from lake ports to the seaboard. Even then, the railway and shipping companies would not improbably combine to deprive the general public of any advantage in the way of reduced rates. On the other hand, a ship canal would form an unobstructed waterway connecting

harbours serving the most productive parts of the United States; the development of shipbuilding would be encouraged at lake ports; and individual shipowners would be able to compete on equal terms with large combinations. As recommended by the United States Commission, the ship canal would be 21 ft. deep by 215 to 250 ft. wide at the bottom, passing through the Niagara

River from Buffalo to Lasalle, thence by eight locks to Lewiston, through Lake Ontario to Oswego, thence to Lake Oneida and through the Mohawk Valley to the Hudson. The time now occupied by lake steamers between Chicago and Buffalo averages seventy-two hours, and for the same class of vessel between Buffalo and New York, by the proposed waterway, it is estimated at sixty-four hours.

The Ventilation
of Sewers.

To prepare a report on this important and difficult subject was one of the first duties which the new Borough Surveyor of Grimsby, Mr. H. Gilbert Whyatt, was called upon to undertake. Certainly some of the Grimsby sewers appear to be far from satisfactory, the pressure of sewer-air being at times so great as to lift the closed man-hole covers from their frames; in one instance, the cover and frame were blown a distance of 10 ft., the paving itself being torn up. Mr. Whyatt falls foul of the intercepting trap between the house-drain and sewer, and calls it a "fad," but, somewhat curiously, he does not recommend that it should be abandoned. He also says:—"In my opinion, the ventilation of sewers is not desirable, except on those occasions where workmen have to descend for certain purposes. . . . A current of air along a sewer is not a necessity." What he advocates is "a free vent for sewer-air," and this he proposes to obtain by means of shafts carried up the walls of buildings, and discharging at the highest possible levels. He also proposes to compel the owner of every new building to construct a vent-shaft from the sewer side of the drain-intercepting trap, and to carry it up the wall of the building, nominally for the purpose of ventilating the dead end of the drain, but really for the purpose of ventilating the sewer. In other words, he recommends the Corporation to compel private individuals to do the work, which, by law, the Corporation itself is bound to perform. We do not mean to say that a vent-shaft from such a point in the drain would not sometimes be useful, but we do say that the necessity for it would as a rule be of the slightest if the sewers themselves were properly constructed and adequately ventilated, as they ought to be, by the Sanitary Authority. Mr. Whyatt's report is an interesting contribution to the literature of the subject, but the wholesale multiplication of sewer-ventilating shafts on the walls of buildings, as recommended by him, cannot be regarded, either by architects or householders, as a really satisfactory solution of the problem.

Large Trusses. COMPLICATED constructional problems are frequently met with in steel-framed buildings, and their solution is rendered more difficult because details have to be considered with reference to the positions of internal walls and doorways, as well as to the purpose for which a building may be intended. A particularly marked illustration of this point is to be found in the arrangement of the trusses over the great ballroom of the Waldorf-Astoria Hotel, New York, as described in the "Proceedings of the American Society of Civil Engineers." The ballroom is 100 ft. long, 83 ft. wide, and three stories—probably 38 ft.—high. As there are no columns in this apartment,

two great trusses are concealed in the walls of the four stories immediately above, and their construction is so worked out that no indication whatever of their presence can be detected in the adjoining rooms. These trusses are each 85 ft. long by 56 ft. high, and stretching from side to side above the width of the ballroom they are practically equivalent to braced girders, carrying twelve stories of bedrooms weighing, with a reasonable addition for live load, about 20,000,000 lbs., nearly 8,930 tons. Some members of these trusses are of exceptional weight. The lower chords, for instance, are made of several 12-inch I-joists, carried on pins 12 in. in diameter. Although the form of support to which we refer may be regarded as a very simple affair by the bridge builder, or by any other structural engineer, it might not be attempted, and possibly would never be thought of on so extensive a scale by the average British architect. Yet it affords a perfectly safe alternative to the use of columns, which in some cases may be superfluous, and perhaps also objectionable, from an artistic point of view.

Changes in Leicester-square. THE site of No. 28, on the eastern side, is being cleared for the erection of a block of shops, offices, and chambers, after the plans and designs of Mr. J. P. Crosby. No. 28, extending some distance in the rear, was formerly occupied by John Hunter, who in 1783 bought the twenty-four years' lease of the house and of what was then No. 13, Castle-street, together with some ground abutting against Leicester-court, entered from Castle-street, between the two houses. Upon that plot of land Hunter built, at a cost of 3,000*l.*, a museum for his anatomical collections and lecture and dissection rooms. Amongst the papers and drawings deposited in the Royal College of Surgeons by Sir Richard Owen's executors, we have seen, by the Librarian's courtesy, a plan of the two houses, the museum, and the classrooms, drawn by Hunter's chief assistant and curator, William Cliff. The museum, which had since formed (until four years ago) the principal workshop of a firm of musical instrument makers, rose through two stories having a wide gallery midway and was lighted by three cupolas in the roof. In that house, formerly known as No. 12, Leicester-fields,* John Hunter held his Sunday-evening receptions, set up a printing-press and book-warehouse, and in 1785 established with Dr. Fordyce the Lyceum Medicum Londiniense. On the opposite side of the square No. 48 is about to be rebuilt, after the designs of Messrs. Treadwell & Martin, and the site has been cleared of Nos. 45-6, together with that of No. 62, Whitcomb-street in the rear. The new buildings for the Dental Hospital of London, at the square's south-eastern corner, have been erected by Messrs. George Trollope & Sons, contractors, from Messrs. Young & Hall's plans and designs, the Charity Commissioners having made, last March, an order for the sale for 18,000*l.* of the present hospital buildings, covering about 3,000 ft. superficial on the southern side of the square.

* In the auctioneer's catalogue (Stone Collection) of the sale of some of Hunter's household effects, including a set of painted hangings by Zucarello, on September 24, 1806, the house is described as "his residence, No. 28, on the east side of Leicester-square." Hunter died in 1793.

Carshalton Park. THE finely timbered grounds of Carshalton Park having lately been sold by the freeholder, Captain J. W. Blake Taylor, J.P., are being plotted and cut up for the erection of houses and villas. The property, with a mansion known as Mascall's, was purchased in 1696 of Sir Edmund Hoskins by Sir William Scawen, whose nephew and heir, Thomas Scawen, employed Leoni to design a new house upon a very extensive scale, which, however, was not erected. Leoni published his drawings for the house in his work upon the architecture of Leo Baptist Alberti. To Leoni are ascribed the stone piers, standing about 110 ft. apart, between which are the fine wrought-iron gates we lately mentioned, and which were unfortunately damaged by the fall of a tree in the avenue in the winter seven years ago. The piers carry, respectively, leaden statues of Actaeon and Diana. The park, surrounded by a wall now partly pulled down, about 2 miles in length, had been latterly the home of the Aitken family.

We have received from the London and Lancashire Fire Insurance Company a set of rules which they issue for the guidance of their clients when fitting up electrical installations for light, heat, and power. They have been carefully drawn up, and will prove useful to both consumers and electricians. Although principally, they are not exclusively concerned with fire risks—for example, the only rule which is printed in capital letters is the 93rd, which runs as follows: "Where conductors carrying alternating currents are enclosed in metal conduits, the positive and negative conductors must be run in the same tube." When this is not done the inductive action set up is so strong that the lamps burn dimly, but there is, of course, absolutely no danger of fire. The only rule to which we take objection is the one on testing (180). In the first place it is ambiguous, as it may mean that either of the two insulation resistances mentioned must be above a certain minimum, or that both must be above this minimum. Again, the rule is quite inadequate from the fire-risk point of view, as no mention is made of testing the insulation resistance between the mains when the switches are turned on and the lamps are taken out of their sockets. It is, however, a step in advance when a Fire Office recognises that there are two insulation resistances to be measured. When will practical men awake to the fact that there are three?

EXHIBITION OF MODERN ILLUSTRATION.—It has been found necessary to postpone the opening of the Exhibition of Modern Illustration in the Indian Section of the Victoria and Albert Museum from Monday, January 7, until Monday, January 14. The private view will consequently take place on Saturday, January 12, instead of January 5, as previously announced.

COLLAPSE OF A BUILDING NEAR FLEET-STREET.—The ground floor of premises known as Nos. 3, 4, and 5, Gunpowder-alley, Shoe-lane, suddenly gave way on the 31st ult., with the result that one man was killed and two injured. Messrs. Eyre & Spottiswoode have recently taken possession of the building. At the time of the accident a large quantity of paper and other material was stored on the ground floor. At the moment the floor fell a man was in the basement and was buried beneath a large heap of debris. The police hastily removed the material, but when the body was discovered life was pronounced to be extinct. Two men—one named Charles Bradley, aged twenty-two, and the other, Henry Miller, aged twenty-one, a brother of the man who was killed—were injured in the fall.

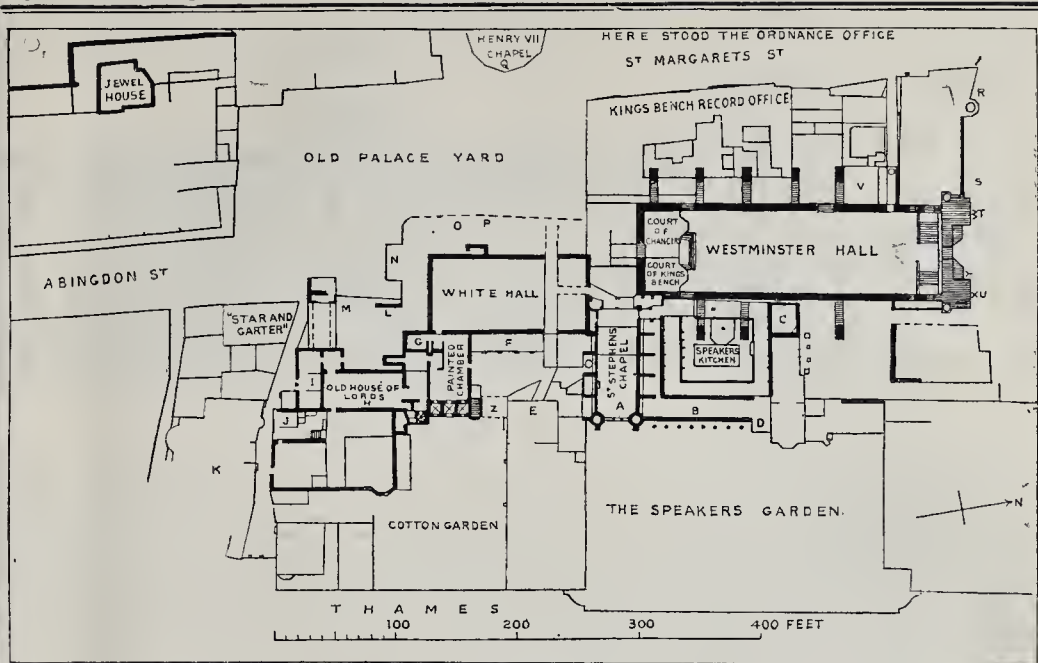


Fig. 1.—Old Houses of Parliament, Westminster Hall, &c. (From Smith's Plan.)

WESTMINSTER, OLD AND NEW:
1801-1900.

WESTMINSTER was accounted as a city during the ten years' tenure of the bishopric of Westminster by Thirlby, Bishop of Westminster, 1540-50, whose see comprised all of Middlesex, Fulham excepted. Letters patent passed under the Great Seal revive the old style by declaring that from November 1, 1900, being the date of the election of Borough Councillors, the Metropolitan Borough of Westminster, so constituted by an Order in Council of May 15 last, should be a city by name of the City of Westminster. We therefore may take the opportunity of recalling to mind some of the more important of the changes that during the last hundred years have quite altered the aspect of a quarter of the town which comprises the remaining portion of the ancient parish of St. Margaret, once co-terminous with the manor around the Benedictine monastery of St. Peter, and including the Royal palaces, with the seats of the Legislature and of the administration of justice.

The Abbey and Chapter-House.—Soon after James Wyatt (appointed surveyor to the Abbey on January 23, 1776) had begun, in 1803, the reparation of the exterior of Henry VII.'s Chapel a fire on July 9 in the roof and lantern of the Abbey church caused considerable damage, so that the necessary immediate expense of nearly 4,000*l.* prevented the Dean and Chapter from proceeding with the Chapel. In July, 1809, the work was resumed by Wyatt (*ob.* 1813), and completed by his son Benjamin in 1822, Thomas Gayferre the younger (*ob.* October 20, 1828) being the master mason. Gayferre bestowed infinite pains upon preparing the casts and drawings; the latter he and his foreman, Richard Lane, made at his house in Abingdon-street. The "Committee of Taste" chose Bath stone from Coombe Down, with Hopton Wood stone for the window-sills, and the Commons voted an aggregate grant exceeding 42,000*l.* In 1814, Gayferre, under Benjamin Dean Wyatt's directions, renewed the south transept marigold window, filled with stained glass by Thomas Ward and J. H. Nixon in 1847. Edward Blore (*ob.* 1879), architect to the Abbey, restored the north side of the nave in 1839, and designed choir stalls to replace the debased Gothic stalls erected by Dean Thomas. Sir George Gilbert Scott, appointed architect to the Dean and Chapter in 1849, Samuel Cundy being master mason, restored, 1865-73, the Chapter

House [February 10, 1872]* built in 1250-6 and wantonly converted, after the removal in 1547 of the Commons to St. Stephen's Chapel, into a depository of public records. He designed the marble and alabaster reredos, by Messrs. Poole, the Abbey masons, with the altar table, by Messrs. Farmer and Brindley [November 9, 1867], and the two transept wrought-iron screens and gates, by Potter [October 11, 1856]. Scott restored the south transept gable, and began the restoration of Solomon's Porch, north transept, completed (with the wall arcading and tracery in the gable) by his successor, J. L. Pearson, who also, in 1878-01, restored the east end of the choir and the south exterior of the nave and aisle, stone from the Chilmark and Wardour quarries being largely used. Bernasconi had restored the altar screen in artificial stone after Wyatt's drawings—the present frieze and sculptured groups are by Mr. H. H. Armistead, the mosaic of the "Last Supper" by Dr. Salviati, of Venice, after Messrs. Clayton and Bell's designs; the carrying through of the work being mainly due to the efforts of Sub-Dean Lord John Thynne (*ob.* 1881). Scott also planned and designed some residences for the Canons. This journal should not fail to cite the burial in the Abbey of Sir William Chambers (1796), James Wyatt (1813), Sir Charles Barry (1860), Sir G. G. Scott (1878), G. E. Street (1881), and J. L. Pearson (1897); also of Thomas Banks (1805), Telford (1834), and Robert Stephenson (1859); Samuel Arnold (1802), William Shield (1829), Muzio Clementi (1832); Sir William Sterndale Bennett (1875); Sir Charles Lyell; and William Spottiswoode.

Thus far the Royal Commissioners' scheme (1801) for a monumental Chapel as an annex to the Abbey has come to nought; meanwhile, the demolition in December, 1895, of Nos. 1-4, Old Palace-yard, land 1-3A, Poet's-corner, with the laying out of a garden on their site, afford a fine prospect of the Chapter House and the Abbey from the south-east. On February 16, 1884, and December 27, 1890, we illustrated James Fergusson's and J. L. Pearson's proposed additions to the Abbey.

St. Margaret's Church.—S. P. Cockerell, in 1798-9, restored the interior, and built a new roof, with galleries, &c. Scott carried out further improvements and refittings. The east porch (J. L. Pearson, 1894) was the gift of Lady Sherbrooke in memory of her husband, Robert (Lowe), first Lord Sher-

brooke, and contains his bust by Mr. Ezekiel, of Rome. In 1807, J. T. Groves, as surveyor to the Commissioners for improvements around the Church, raised the level of the graveyard; in 1881-2, about 4,000*l.* was expended, under J. L. Pearson's superintendence, in laying out the churchyard and the Abbey burial-ground, placing the railing that divided them close to the Abbey's north side, and sinking the grave-stones beneath the surface.

The Houses of Parliament.—Under Acts passed in 41-6 Geo. III. were acquired various buildings on the east side of Old Palace-yard, on the south side of New Palace-yard by the north front of the Westminster Hall, between Henry VII.'s Chapel and St. Margaret's Church, and along the west side of St. Margaret-street. The houses on the east side of Old Palace-yard gave place to James Wyatt's front to the House of Lords—the Court of Requests whither the Peers had migrated after the passing on July 2, 1800, of the Act of Union with Ireland. Comparing W. Capon's large-scale plan, 1793-1823, with Soane's, 1795, C. J. Richardson's (before the fire), 1835, and J. T. Smith's, 1807 (see fig. 1), we see that amongst the demolished buildings in Old Palace-yard stood, as reckoned from north to south, the Court of Wards and Liveries at the Hall's south end, Bellamy and Kew's, the Commons entrance, the "Ship" tavern, Casteel's (a very old house), and "Queen Elizabeth's Pear-tree" tavern, "Waghorn's" coffee-house, and the (old) Lords entrance facing south in the then north-east angle of the yard, the (old) Ordnance Office, and the (old) King's entrance and "Star and Garter" tavern at the two corners of Parliament-place that led to Parliament-stairs. The two last-named stood directly opposite No. 5, Old Palace-yard, now Mr. Labouchere's house, and Bellamy's opposite Poet's-corner. James Wyatt reconstructed for the Lords in 1800-1 the Court of Requests or White Hall in 1800-1 the Court of Requests or White Hall which is supposed to have been the great hall of the Confessor's palace; against its west wall stood the Groom Porter's. For the later King's entrance and Royal Gallery, Soane, appointed in 1791 clerk of the works at St. James's Palace and the Houses of Parliament, pulled down, in or about 1823, the Prince's Chamber, and the former House of Lords situated between Prince's Chamber (south) and the Painted Chamber (north), the west wall of the latter abutting against the east wall, at its south end, of the Court of Requests. (For illustrations of the old Houses of Parliament and the Painted Chamber, see lithograph in this week's issue.)

* Dates in square brackets relate to illustrations in the *Builder*. Mr. Henry Poole, master mason, 1856-92, died on February 25, 1892.

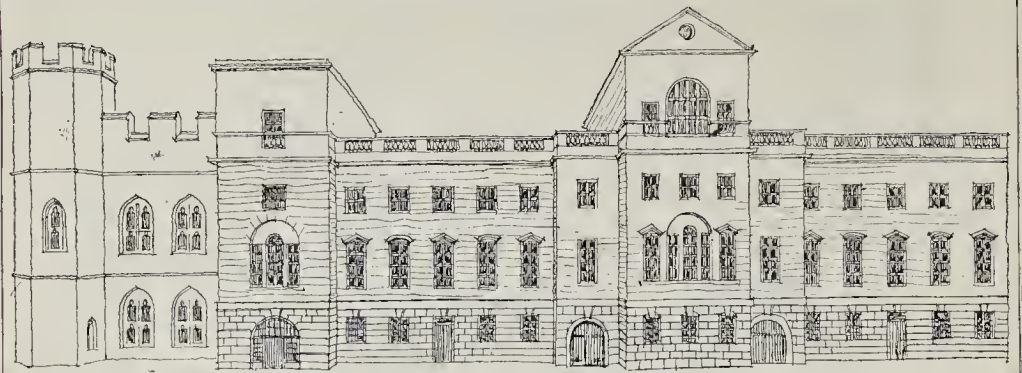


Fig. 2.—West Front of the Law Courts, Westminster. (Pulled down in 1883.)

Prince's Chamber was built *temp.* Henry III. over foundations of the Confessor's day; the Painted, or St. Edward's Chamber formed, reputedly, his bed-chamber and the scene of his death; the original House of Lords, or Parliament Chamber, rebuilt by Henry II., had beneath it the vaults, being the old palace kitchen, wherein Guy Fawkes laid his train. After the fire on October 16, 1834, Sir Robert Smirke re-roofed and refitted the Painted Chamber (pulled down in 1852) as a temporary House of Lords, the Commons being similarly provided for in the Court of Requests. The Lords first sat in their new House on April 15, 1847, the Commons in theirs on November 4, 1852.

On July 17, 1835, a Royal Commission was issued for choosing a site and obtaining designs. The acting Commissioners, Hanbury Tracy (Lord Sudeley), Sir Edward Cust, Thomas Liddell, and George Vivian—Lord Duncannon being First Commissioner of Woods and Forests—were instructed to select not less than three, and not more than five, designs. Of the ninety-seven sets they chose on February 29, 1836, that marked with a portcullis, and for the most part drawn by Barry's own hand. They awarded premiums of 500*l.* apiece also to—in the order named—Buckler, Hamilton, and William Railton (*ob.* 1877). The other competitors included Professor Cockerell (*ob.* 1863), Thomas Hopper (*ob.* 1850), Rickman and Hutcheson, James Savage (*ob.* 1852), Sir Robert Smirke (*ob.* 1867), Robert Wallace, J. Burgess Watson (*ob.* 1881), John White the younger, William Wilkins the younger (*ob.* 1839), and Lewis William Wyatt (*ob.* 1853). The coffee dam for the river front was begun in the autumn of 1837. In the autumn of the following year, Barry, with others, made a tour in Great Britain to choose a suitable stone. The terrace-wall, 920 ft. long, of Aberdeen granite was begun in the next spring. On April 27, 1840, Lady Barry laid the first stone of the superstructure at the angle of the plinth of the Speaker's house nearest to the bridge, and on December, 22, 1843 (her birthday), she and her husband laid the first stone of Victoria Tower. The exterior material is fine magnesian limestone from Anston, Yorkshire; the interior is mostly of Caen stone; the fabric rests upon a concrete bed 12 ft. thick; the inner brick walls carry floors upon cast-iron bearers, with brick arches turned from girder to girder; the wrought-iron roofs are covered with galvanised iron plates, and timber has been very sparingly employed; on the whole first floor there is no step. Barry gave the superintendence of the stone-carving to John Thomas, and that of the wood-carving to A. W. Pugin; he himself designed the canopy of the throne in the House of Peers. The Queen made her first State entry into the Victoria Tower on February 2, 1852, at the opening of the new House of Commons; on the 11th of that month she knighted Barry at Windsor. Charles Barry assisted his father during the progress of the works, and E. M. Barry (*ob.* 1880) after Sir Charles's death in 1860, completed the structure. His work includes the restoration of St. Stephen's crypt [July 9, 1864], the arcades and enclosure, New Palace-yard [January 11, 1868], and in 1860-6 the Queen's robing-room and staircase, and the decoration of the central octagonal hall. In the crypt the seven windows are by Hardman, the decorations by Crace and

Messrs. Clayton & Bell, the wrought-iron railing around New Palace-yard is by Hardman, Mr. H. H. Arnstead carved the statues of kings.

The Clock.—In 1851 the Government asked Lord Grimthorpe, together with Airy, Astronomer-Royal, to draw specifications for a clock for the Victoria Tower. Vulliamy and other leading clock-makers, invited to tender for the work, demurred to the stipulation that the clock was to be guaranteed to perform within a margin of one minute per week, that limit of error being, they averred, too small. So the work was entrusted to Mr. E. J. Dent (*obit.* 1853), who agreed to make a clock after Lord Grimthorpe's designs. For that clock Lord Grimthorpe invented the double three-legged gravity escapement, as well as a new maintaining power and a novel contrivance for letting off the hours in order to satisfy another one of the conditions, which required that the first blow of the hour should be made within one second of true time. He also devised for the clock a zinc and steel compensation pendulum, of which the principle was since adopted for the standard sidereal clock at Greenwich Observatory.

Sir Charles Barry's plan, extending over nearly eight acres, covers more ground on the south, north, and east sides than did the former Houses. J. T. Smith's plan (fig. 1) shows that at the time of the fire the House of Lords (Court of Requests) stood with its north and east walls closely against the angle of Old Palace-yard, the west wall being in alignment with the longer axis of Westminster Hall; between the Hall and the Court of Requests lay the House of Commons, now represented by St. Stephen's Hall above the chapel crypt or St. Mary-in-the-Vaults; on the Hall's east side are Star Chamber-court and the court of the later Cloisters with the Chapel or Oratory built *circa* 1530 by Dr. Chambers, last Dean of the College, and restored by Barry (October 25, 1851). Star Chamber-court marks the sites of the old stables and Exchequer. The Painted Chamber's site is that of the Peers' Lobby Corridor (west), to the north of which is the Judges' Court, where stood the (old) House of Lords, and next south of that lay the Prince's Chamber. The present Central Hall with its corridor and Peers' Lobby (south) and corridor and Commons' Lobby (north) are built over the Cotton and the Speaker's Gardens. On December 13, 1884, January 24, March 21, and July 11, 1885, we illustrated Charles Barry's modifications of his father's designs for the completion of Westminster Palace and treatment of Westminster Hall, by enclosing the Hall within a building to extend from Old Palace-yard to Bridge-street, and so forming a quadrangle around New Palace-yard, at an estimated cost of 500,000*l.*

Westminster Hall.—In 1810-22, under the superintendence of J. W. Hiorl, of the (old) Abbey of Works, Thomas Gafeyre, mason to the Abbey, restored the north and south ends of the Hall, together with the embattled towers at the sides of the north porch, attributed to William Wykeham; slate was substituted for the lead upon the roof, into which dormers were introduced; the interior roof, constructed of the *quercus densiflora*, was repaired with forty loads of oak timber brought from old

ships broken up in Portsmouth Dockyard. In 1844-6 Sir Robert Smirke recased the outside of the west wall and refaced the inside walls with Huddleston ashlar 6 in. thick, and laid the present pavement at the level of the old Purbeck stone pavement of *temp.* Richard II., which he found at a depth of 1 ft. 3½ in. below the Yorkshire flagstone floor laid at the latter end of the eighteenth century. At a depth of 2 ft. 9½ in. below the Purbeck pavement he found a hard surface of gravel and clay rammed level, beneath which lay 8½ in. of pure red sand, and beneath that a layer 7½ in. of masons' rubbish, Caen, Reigate, and rag stone, &c. Smirke erected the cast-iron louvre or lantern modelled after its late fourteenth century predecessor. The upper row of openings in the roof were made in 1843 for an exhibition of drawings. Sir Charles Barry added a bay to the Hall, removing the south window for his archway to St. Stephen's Porch, on the site of the Court of Woods and Liveries, and rebuilding it in the porch [February 18, 1843, September 3, 1853, and April 4, 1855]. The stained glass, of heraldical achievements of our sovereigns and the founders of their houses is by Hardman (1847-52), whose firm of John Hardman & Co. restored the nearly one hundred panels of leaded glass and the outer diamond glazing after the dynamite explosion on Saturday, January 24, 1885. Into the Hall's hitherto unbroken area have been obtunded (1886) two flights of steps that lead into the Journal, Private Bill, and other offices erected by J. L. Pearson on its west side. The Select Committee, of which Mr. G. Shaw-Lefevre was chairman, reported (April 27, 1885) in favour of Pearson's scheme, at an estimated cost of 5,000*l.*, for completing the corner of St. Stephen's Porch in harmony with Barry's work, 8,000*l.* for rebuilding and repairing the flying buttresses and repairing the west wall, and 13,500*l.* for the two-storied gallery and the building at right angles to the Hall. Having expressed *passim* our opinion upon that piece of sham "restoration," we will say here only that the building, based upon little more than conjecture, stands over the ground which Soane so skillfully used. In our lithograph will be found a sketch of the buttress uncovered when the Law Courts were removed, and since refaced in Pearson's "restoration."

The Law Courts.—The Court of Queen's Bench held its final sitting at Westminster Hall on December 21, 1882. On December 4, Lord Chancellor Selborne and the Judges had proceeded down the Hall in solemn state on their way to receive the Queen at the opening of the new Courts of Justice. Descending the steps from St. Stephen's Porch they passed between the places where, until eighty years ago, the Courts of Chancery and King's Bench had sat since their permanent establishment there in 1224. To Soane was given a confined space between the Hall and Kent's King's Bench Record Office. At the north end, facing New Palace-yard, stood the Court of Exchequer, formerly Queen Elizabeth's ballroom and breakfast-room, south of which were the Court of Common Pleas (Queen Elizabeth's

* See a letter from his son in the *Times* of January 2, 1895, and S. Smirke's communication to the Society of Antiquaries on February 4, 1846 (*"Archæologia,"* vol. 26).



Fig. 3.—Ashburnham House and Entrance to Dark Cloister; showing the late Dr. Turlie's House (over Cloister Entrance), pulled down in 1883.

bedroom), and Old Fish-yard. Soane constructed (1820-5) a corridor under, and inserted Judge's chambers between, the six or seven buttresses, and plotted the remaining area from north to south, for the King's Bench and Bail Courts, the Courts of Exchequer and Common Pleas, the Vice-Chancellor's (afterwards the Rolls Court), and the High Court of Chancery; for the Admiralty Court he provided in an upper-floor at the south. Soane's courts (see fig. 2) were justly extolled for the dignity, variety, and acoustical properties of their interiors, as well as for their lighting, ventilation, and means of access. The King's Bench Record Office was originally designed, after the Palladian mode, by Kent with, some say, Ripley's help, in or about 1738-9, for the records of Parliament, the estimate amounting to the large sum of 107,067*l.* The central block and south wing appear in plate IV. of Malton's "London and Westminster," 1792; James Wyatt probably added the north wing in 1813.

Barry pulled down most of the south wing and return front to Old Palace-yard in 1850, and in January, 1883, was begun the demolition of the west façade, the stones being taken to the Albert Palace, Battersea Park. Soane's courts speedily followed. Their removal exposed the buttresses and lower walling of *temp.* Richard II., which occasioned the controversy already referred to. The handsome marble chimney-piece in the judge's room behind Queen's Bench Court was removed to the Lord Chief Justice's private room at the Royal Courts. In the then Margaret-street, opposite Kent's Record Office, stood the Ordnance Office, 1784, by William Tyler (*obit.* 1801), which was pulled down in the Act passed on June 10, 1805. George Canning's statue marks its site.

Westminster Bridge, Canon-row, and New Scotland Yard.—An Act, 9 Geo. II., c. 29, passed in 1736, constituted a commission to choose the design and materials of a bridge, without houses upon it, and to raise 625,000*l.* by a lottery. Batty Langley made some designs, but in May, 1738, the Commissioners appointed Charles Labelle, a Swiss, whom it is said they invited to England, as "engineer" at a salary of 100*l.* a year with 10*s.* a day as subsistence money. The original proposal was to build the superstructure of wood, and Labelle's commission related to the construction of the stone piers only. The first pile was driven on Wednesday, September 13, 1738, after a method contrived by James Vauloué, a watchmaker, to whom the Royal Society voted their medal.

In the "Crowle" Pennant is an engraving by W. H. Toms, 1738, after H. Gravelot's drawing, of Vauloué's three-horse engine and one of W. Elbergher's machine for sawing off, under water, the piles used to support the centerings. Labelle built his piers upon caissons which he floated into position and then sank with loads of stone. In March, 1740, the preceding winter's frost and ice having destroyed the piers, a stone bridge was agreed upon; the last stone was laid on October 25th, 1740, yet the bridge was not opened throughout until November 18, 1750, as one pier and two arches were re-built. The bridge (see view in lithograph), 1,223 ft. long and 44 ft. wide at the arch-soffits, had fifteen

semi-circular arches with channelled voussoirs, and spans diminishing from 76 ft. (middle arch), to 25 ft. (two end arches); the bridge ends had at first a gradient rate of 1 in 15, since changed to 1 in 22-3. Thomas Gayfer the elder was chief mason, the builders being Andrews Jelfe and Samuel Tufnell. In the British Museum is a bound volume, *Addit. MSS. No. 27,587*, of Jelfe's cash accounts, and a mass of letters he wrote, October, 1740—June, 1744, mainly concerning the progress of the works and the supply of Portland, Kentish rag, Purbeck, and Cornish Moor stone. The cost is generally stated to have amounted to 218,200*l.*, with 170,700*l.* for the approaches, and Bridge-street on the site of the Long Staple, but an official return made in 1863 gives the total cost as 393,180*l.*, whereof 145,057*l.* was paid to the builders, and 248,132*l.* to other parties, with 109,054*l.* for the approaches.*

In 1823 Telford found that the substructure of the piers had sunk considerably; the subsequent removal of old London Bridge increased, as he foresaw, one of the causes of the settlement; two or three piers gave way, and in August, 1846, the bridge was closed to traffic. The fabric was relieved of it, is said, 30,000 tons weight by the substitution of a lower parapet, the removal of the high canopies from the alcoves, and the lowering of the roadway. Some of the alcoves have been re-erected in Victoria Park. Sir Charles Barry proposed, and we believe made designs for, an iron bridge of five arches, in the Gothic style. Thomas Page's bridge was begun in July, 1854, upon a tender for 201,000*l.*, and opened in its entirety on May 24, 1862. The total cost amounted to, we believe, 206,000*l.* The old bridge was first lighted with gas on December 31, 1813, from the Gas Light and Coke Company's works, originated by F. A. Winsor, and established on the site of the Bower teagardens, Horseferry-road, in 1812. In November last the London County Council resolved to re-build Lambeth Bridge (Messrs. Barlow), finished in 1862 at a total cost of 48,924*l.*

Near the north end of the bridge stands St. Stephen's Club, by John Whichcord the younger [April 11, 1874]. The building in Canon-row, distinguished by its Ionic portico at the top of a flight of steps, and its spacious circular hall, which William Pilkington (not William Atkinson, as is generally said) designed, 1810, for the Ordnance and Transport Office, served latterly for offices of the Civil Service Commission. It gave place last year to some offices and a police station, by Mr. J. Dixon Butler, official Architect and Surveyor to the Receiver for the Metropolitan Police District, as an addition to the adjacent headquarters, known as "New Scotland-yard," erected in 1888-90, on the site, 150 ft. by 200 ft., of the abortive Grand National Opera House. New Scotland-yard planned and designed by Mr. R. Norman Shaw, R.A., was built by Messrs. John Grover & Son, as a total cost of about 120,000*l.* Close by was the original home of the Royal Architectural Museum

* Mr. R. Bissell Prosser, s.v. "Labelle," Dictionary of National Biography, cites a model of the bridge at the Ecole des Ponts et Chaussées, and the original drawings, signed by J. Gayfer, preserved in the library of the Institute of Civil Engineers, where, too, is Francis Wisbaw's description (1833) of the edifice, for which he gained the Telford Medal. On February 27, 1751, an honorarium of 2,000*l.* was awarded to Labelle.

[January 3, 1851], founded by Sir G. Gilbert Scott and Beresford Hope, in 1851, and removed to No. 18, Tufton-street, formerly Bowling-alley (Ewan Christian and Joseph Clarke), in the summer of 1860.

Broad Sanctuary and Dean's Yard.—The former Guildhall or Sessions House was erected in 1804-5 after C. P. Cockerell's designs [May 14, 1802] on the site of the meat market (1751) which had been established there as early as 1568, and stood over part of the foundations of the Sanctuary Church, of (reputedly) Edward the Confessor's time, and of the bell tower built by Edward III. for the use, it seems, of the Minster. Cockerell's Guildhall, constructed of brick and quadrangular on plan with recesses at the angles, had its principal court in the centre lighted by round-headed windows between the angle oiers of an octangular tower, with a pointed roof carrying a lantern and vane. Above the cornice moulding of the piers that ran all round was a blocking course, surmounted with a light and lofty balustrade, having three panels in each face. The main front had a tetrastyle portico, of the Doric order, with a pediment. It was reconstructed (1803) by Messrs. Higgs & Hill, at a cost of nearly 20,000*l.* (with 3,000*l.* for furniture and fittings) for the Middlesex County Council after the designs of the County Surveyor, Mr. F. H. Pownall. On the second floor are an octagonal council chamber, 36 ft. by 36 ft., committee, ante, reading, smoking, and cloak rooms, with the County Surveyor's offices; on the ground floor are two courts, offices for the executive staff, private rooms, &c. After the burning of the Houses of Parliament (1834), Bellamy's stock of wines was removed into the vaults beneath the Sessions House, and thence to Parliament-street. The vaults had formed the cellars of the (later) "Quaker" tavern in Thieving-lane. The monument (Sir G. G. Scott—the St. George and Dragon is by J. Clayton) erected in memory of "old Westminsters" who fell in the Crimean and Indian Mutiny campaigns, stands next, south-east, to the site of the old Gate House, pulled down in 1760, and next, east, to that of the Cheyne Gate. Scott was architect of the block of houses, facing northwards, between the Jerusalem Chamber and the end of Victoria-street [March 4, 1854]. In fig. 3 is given a sketch of part of the east side of Dean's Yard as it appeared before 1883, when Dr. Turlie's house was pulled down and other alterations made. For the Westminster Hospital, founded in 1719 in James-street, competitive designs were made by Sir Charles Barry; it was built at a cost of 27,500*l.* in 1832-3; by W. Inwood, his son Charles Frederic Inwood (*obit.* 1840) assisting him in the work; two clinical laboratories were added last year. The Royal Aquarium, by Mr. A. Bedborough [May 1, 1875, and January 22, 1876] was opened on January 22, 1876. S. S. Teulon designed the memorial fountain to Sir Thomas Fowell Buxton, Bart., 1865 [January 27, 1866]. On June 24, 1891, was laid the first stone of the Church House, built by Messrs. John Thompson after the designs [January 2, 1897] of Sir Arthur Blomfield, who also designed the case for the organ, by Messrs. Lewis & Co.; the second block, for the House of Laymen, begun in the autumn of 1899, stands on the site of the old Westminster Library in Great Smith-street. The total estimate amounts to about 200,000*l.*

(To be concluded in our next.)

THE GRAND THEATRE, ISLINGTON.—This theatre, which was destroyed by fire in February last, has now been rebuilt. Formerly the exits were all on one side of the house, but now additional exits and staircases have been built on the other side, in compliance with the requirements of the County Council. New exits have also been provided from the stage and the dressing-rooms, and that part of the theatre which is behind the proscenium has been completely rebuilt and rearranged. An asbestos fireproof curtain now separates the stage from the auditorium. The latter has been reconstructed much on the old plan, but the upper part of the private boxes has been removed, to allow of additional accommodation in the amphitheatre; and the seats in the area have now been set out in curves instead of, as formerly, in straight lines, to give a better view of the stage from the sides. Hot-water pipes have been laid throughout the house, and the electric light has been installed both behind the scenes and in a part of the auditorium. The ceiling and the walls have been decorated with hand-painted panels after the designs of the architect, Mr. Frank Matcham.

Illustrations.

ILLUSTRATIONS OF SIR CHARLES BARRY'S WORKS.

THE first five plates given with this issue are illustrations of the work of Sir Charles Barry, and are all referred to in the article on him on another page.

They include an elevation of his design for concentrating the Government Offices in one building, with block-plans of the building and the district as proposed to be laid out, and a sheet of sections and elevations of the various buildings indicated in the plan; both these are from original drawings in the possession of Mr. C. A. Barry, the architect's grandson. The drawings of the Victoria Tower and the Halifax Town Hall were specially made for us by Mr. W. Monk. Sir C. Barry's view of the Ruins of Karnac is reproduced from a pencil drawing in the possession of Sir J. Wolfe Barry, to whose kindness we and our readers are indebted for enabling us to give this beautiful example of Barry's early work as an architectural sketcher.

MILTON ABBAS.*

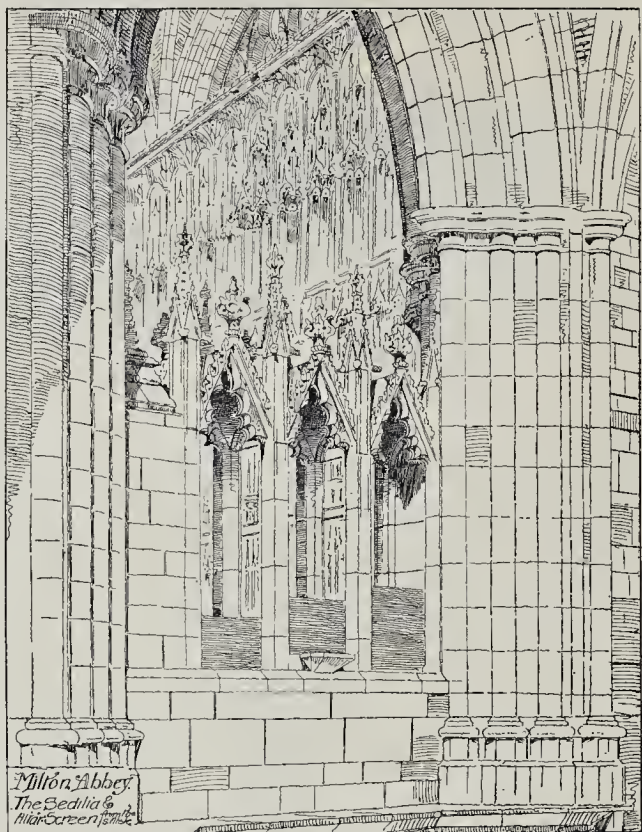
BEFORE the victory of King Athelstan over the Danes at the Battle of Brunenburgh, he is said to have had his success foretold him in a vision on the hill which rises east of the Abbey Church of Milton, on the spot where the little Chapel of St. Catherine now stands, and to have founded a monastery here, in or about 937. The establishment seems to have been originally one of secular canons, but according to the Saxon Chronicle these were expelled by King Edgar in 964 and monks substituted. Like Sherborne, Milton was a house of Benedictines, and its church is a large and interesting, although incomplete, example of the fine buildings characteristic of the order.

The extent of the original building is unrecorded, but in 1309 the buildings were sufficiently destroyed by a fire, caused by lightning, to necessitate the rebuilding of the church. According to Nicholas Trivet, the church was burned on Tuesday, September 2, including "the bell tower and bells, the ornaments of the church, and the evidences of the monks."† In 15 Edward II. a patent was granted "pro constructione abbaticæ," and from the architectural evidence, building must have continued from time to time up to within a few years of the Dissolution in 1539, 31 Henry VIII. The site and buildings were then granted to John Tregonwell, in consideration of 1,000*l.* and the forfeiture of a pension of 40*l.*, and after, in later years, passing into the hands of the Damer family, it came to its present owners, the Hambros. The monastery was pulled down with the exception of the abbot's hall, and the house designed by Sir William Chambers about 1771 in debased Gothic of the period. The church underwent a "restoration" by Wyatt in 1789, and in 1865 the whole church was restored by Sir C. G. Scott.

The planning and extent of the church previous to the fire of 1309 is now lost, but on the south side of the presbytery—east of the sedilia and east of the stalls—are two openings in the wall, left probably at the time of Scott's restoration, in which are to be seen remains of enriched Norman arches. The curious arrangement of the presbytery with alternate bays closed by solid masonry, suggests the possibility of the earlier work having been encased where it was not considered worth while to remove it, and it is quite possible, owing to the great scale of the church as replanned, that the present incomplete buildings occupy the site of the entire length of the earlier church. There was a Lady Chapel (probably of three bays, as at Sherborne); a choir and presbytery of seven bays, with aisles and an eastern ambulatory; a large south transept; a "crossing"; and a north transept of one bay. On the "crossing" rises a central tower of similar character to that at Sherborne. The various parts were built in the order named, the work having commenced probably, as was usual, at the east end. The size of the north transept, although one of the latest parts of the building, was no doubt restricted by buildings already standing north of it. The

* With this Abbey our series of the Abbeys of Great Britain is concluded. A list of those abbeys which have appeared will be found on page xxvii.

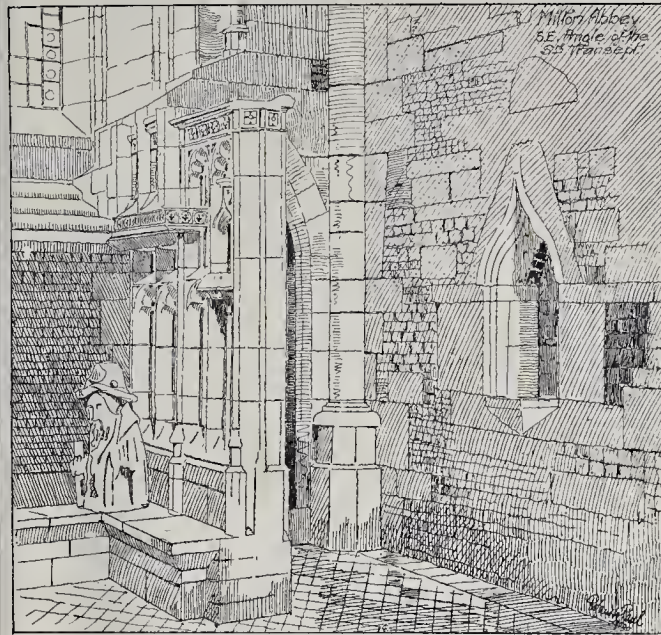
† Hutchins' "History of Dorset," vol. iv.



nave of the church seems never to have been rebuilt. The aisle walls exist for a few feet westward of the crossing, and show the jamb of windows. At the time of the last restoration excavations were made with the idea of tracing the foundations, but nothing was discovered. At the Dissolution the Lady Chapel was pulled down, and in 1737 the chapel or sacristy (as it probably was) on the north side of the presbytery was destroyed. At the time of Wyatt's restoration (1789) the interior of the church seems to have been ruthlessly despoiled of its fittings, and the details of interest recorded by Rev. Thomas Warton, in 1781, quoted by Hutchins, were probably by then swept away. In the present century, when the church was again restored by the late Sir C. G. Scott, the stone screen walls at the back of the choir stalls, which were solid up to that time, were pierced with arcades, the screen wall on the north side of the altar, opposite the sedilia, being similarly treated. The encaustic paving tiles found in the floor of the presbytery were removed to St. Catherine's Chapel on the hill eastward, where they are now to be seen, and modern ones by Godwin put in their place.

Beginning at the east end, we have but the site of the Lady Chapel, although a few years ago the foundations were visible. Against the east wall of the presbytery are three arches and vaulting shafts of the ambulatory, and a portion of the outer walls, with the window jamb in the north wall, remains in continuation of the aisle walls. The details of caps and bases to the columns supporting the vaulting agree in date with that of the presbytery, and the features of the Lady Chapel can therefore be roughly determined. The choir and presbytery, remarkable for their length, remain in a very perfect state. The *Pulpitum* is placed under the eastern pair of "crossing" piers, and the choir stalls occupy the first two bays eastward of it. The third bay is a blank wall, showing in the recess on the south side the remains of Norman work already referred to. The fourth bay is open, forming the upper

entrance to the choir. The fifth bay is solid like the third, and the sixth has the sedilia and a piscina on the south, and a stone screen, similar to those behind the choir stalls, on the north. The seventh and last bay is like the third and fifth, and across its centre is the great altar screen wall, 2 ft. 6 in. in thickness, and allowing a space of nearly 4 ft. behind it. Midway between the west face of the screen and the piscina is another opening in the wall with the remains of an enriched Norman arch. The choir is one step above the "crossing," and six more steps lead up in the fifth and sixth bays to the altar. The vaulting is carried on long vaulting shafts mostly carried to the ground, but corbelled back at the western angles over the stalls and over the piscina near the altar. On the north side of the stone screen in the sixth bay was a chapel dedicated to St. John the Baptist. It is described by Hutchins:—"On the north side of the altar was a small chapel between two pillars. On the wooden work next the aisle, painted like marble, was this inscription in black letter:—'Benedic D'ne domum istam, que dedicata est in hon. . . . S'cti Johannis Baptiste, Venientium in loco isto exaudi glorie sue S.s.'" Behind the sedilia and facing the south aisle is a semi-octagonal bracket (see sketch), and in the wall of the next bay westward are the remains of a lofty canopied niche, over which is a stone about 18 in. square, bearing the rebus of Abbot Wm. Milton—the initial W and a pastoral staff, a mill on a tun, and the date 1514. The niche has been elaborately coloured. In the wall of the third bay (facing the aisle) is a small segmental-headed recess, also bearing traces of colour. In the fifth bay (facing the presbytery) are several rings and hooks still remaining *in situ*, which were connected with the Lenten veil. The stalls, thirteen in number on each side, with six more against the *pulpitum*, are for the most part modern, although a good deal of the old work was re-used. Hutchins mentions the removal of eighteen old stalls to make way for pewing erected by Sir Jacob Banks, and



jecting from the wall, and under it, all over the wall, was rich tracery work, now plastered up; and a fragment at one end remains of this piece of work, which was a chantry shrine, apparently about Henry VII.—perhaps the tomb of the great benefactor, William Middleton.*

In the south-west corner of the transept was a cross-legged effigy in armour, and a shield on the left arm, "on which was an obscure cross.†"

At the present time, the only remains of an altar are near the S.E. angle of the transept (see sketch). In the south wall is a piscina of Decorated date, and in the angle the doorway to the stair turret. About 3 ft. 4 in. from the south wall, and projecting about 3 ft. 6 in. from the east wall, are the remains of a wall 1 ft. in thickness, panelled on its north side with a piscina near its west end. It is of Perpendicular date, and is probably a part of the altars referred to above. The platform on which the altars were placed has been removed, and the transept floor covered with modern tiling. The panelled work now forming part of the pulpitum was probably removed from the south transept. The cross-legged effigy has disappeared. There are traces in the plinth of the vaulting shafts of a screen, which separated the transept from the rest of the church. The two western piers of the crossing, although similar in section, have different bases and plinth, and at a lower level than those of the eastern piers. The walls which block the western arch of the crossing, and the arches which would have led to the nave aisles are probably for the most part modern, although the nave never having been built, they may well stand on the site of temporary walls of pre-Reformation date. The present west porch is modern.

The north transept is entirely Perpendicular and only projects one bay beyond the aisles. There is a large eight-light transomed window at the north end, and long narrow three-light windows on the east and west sides. Against its north wall are the remains of a vaulted slype of four bays, and on the west side are the foundations of a large staircase turret which was evidently connected with the doorway, still visible in the north face of the western buttress. This buttress has been repaired in later times and on its west face are the names of churchwardens and the date 1683. The greater part of the adjacent buttress facing north is probably of the same date. The whole points to the probable existence of a staircase leading to the dormitory on the upper level over the slype, chapter-house, and other buildings, which must have existed here.

A great deal of work was apparently done to the church in the Perpendicular period—a large proportion of it doubtless being due to William Middleton, who was Abbot 1481-1525. The north transept with its parapet and those of the aisles of presbytery and choir, the parapet on the west side of the south transept, and the central tower, are all Perpendicular work, and the elaborate vaulting of the transepts and crossing includes, on the bosses, William Milton's initials and rebus. The flying buttresses of the choir and presbytery appear to have been added at the same period, and lastly, the great altar-screen which bears date 1492. On its west face is the inscription:—"Orate pro bono statu et animabus domini Willelmi Middleton hui' alui' monasterii abbatis ac etiam magistri Thomae Wilken hujus parochiae vicarii et decretorum cancellarii qui hoc altare ad dei laudem suis honorifice depinxerunt sumptibus anno incarnationis domini nostri Jhu' Xti millesimo quadringentesimo nonagesimo secundo." A good deal of the altar-screen is modern and probably of plaster, and the inscription is not the original, but copied from it. On the space behind the screen are several fragments, some Norman, others belonging to the altar screen, and preserving portions of the inscription.

The church must originally have been rich in shrines, relics, and monuments. Athelstan gave a piece of the cross, a great cross of gold and silver with precious stones, the arm and many bones of St. Sampson, the arm of St. Branwalader, and many others, and they were placed in the church in five gilt shrines.‡

Possibly most of these relics suffered at the time of the fire in 1309. The south transept would seem to have had a shrine in it (see ante) besides the cross-legged effigy, which

"chapel," or more probably a sacristy, 25 ft. in length, and probably about 12 ft. in breadth. This was pulled down in 1737, and the doorway and the wall ribs on the exterior are the only visible evidences of it. In the first bay (east of the north transept) is a third doorway, coeval with the rest of the eastern arm, which appears, from the appearance of the adjacent buttress, to have led into another building. The shortness of the north transept, with the remains of a vaulted passage or slype on its north side, are clear evidence that the monastic buildings—in this case the chapter house and its surroundings—always existed at this point, and the buttress projecting eastward from the transept is obviously an addition of late date. There is also a record of a passage between the church and the building west of the "oriel" of the abbots' hall. This passage was of later date than the doorway, and it is possible that there was another side-chapel here, similar to the Wykeham Chapel at Sherborne.

After the choir and presbytery, the next in order of date is the south transept. On the exterior the difference may be seen in the level of the string below the window-cills. The window tracery throughout is of later date. The transept projects two bays clear of the choir aisles, and is aisleless. The outer walls are of considerable thickness, and the buttresses are of great projection to resist the thrust of the vaulting. At the south-east angle is a staircase turret, finished with a pyramidal cap with crockets and finial. In the south wall is a large window of seven lights filled with reculいたed tracery. The glass is modern. The lower tier of side windows are of three lights, those in the upper tier being of four, except the window over the aisle, which is of two lights only. The design of the west face of the transept is the same as that of the east (shown in the view), with the exception of the parapets. This on the east and south is original, with ball flower ornament; on the west side, however, it is of pierced quatrefoils, the same in design as on the choir aisles, north transept, and central tower.

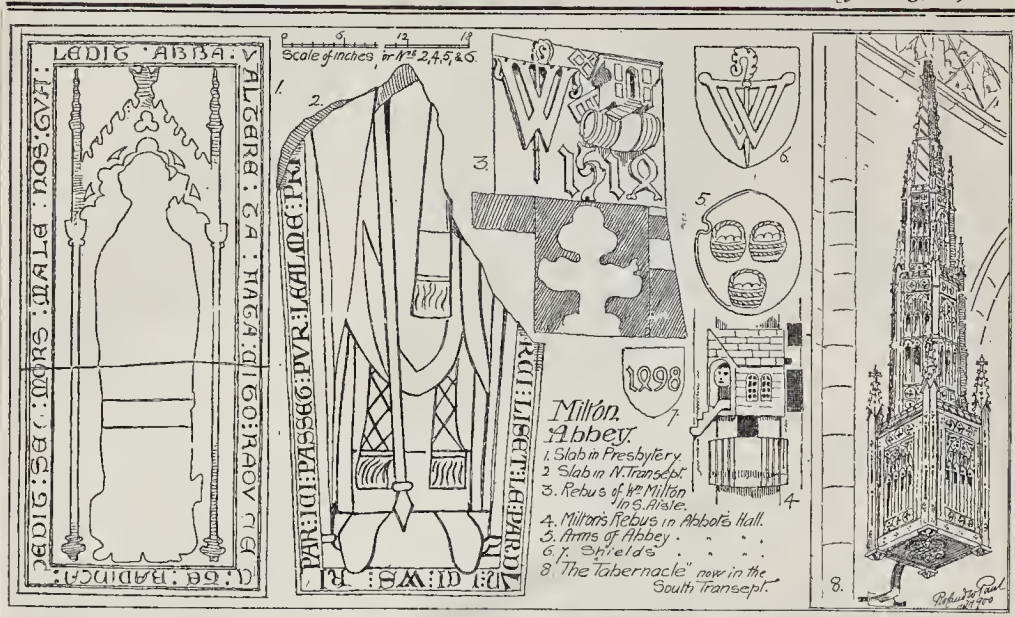
In this transept were formerly many points of interest. Against the east wall were the remains of two altars, or chantries, approached by "an ascent of three steps," "with two cornices of unequal height over them, which have been finely carved, gilt, and painted," and ornamented with remains of black letter inscriptions and armorial bearings. In the notes taken by Rev. Thomas Warton, D.D., in 1781, quoted by Hutchins, he says, "On the east side of the south transept is the ruin of a long, richly-wrought canopy, very high, pro-

See Builder, April 3, 1897.

* Hutchins, iv., 404. † Ibid., iv., 403. ‡ Ibid., iv., 403.

says that "the chancel, anciently part of the choir, was separated from the body by an old screen of wood, on which was I. H. S. and a neat piece of ironwork." At the backs of the stalls, which flank the entrance under the pulpitum, are two figures painted in oil on panel, that on the north representing the founder, King Athelstan, holding a church with three spires, a monk kneeling below, and an imperfect inscription above in black letter: Rex. Atelstan' hui' loci f[undator]. On the south side is the figure of a queen, holding what appears to be a parrot, but probably intended for a hawk, picking at the wing and claw of a bird. A white glove is held in the right hand. The panels measure 3 ft. 3 in. in length, and 1 ft. 8½ in. in breadth, and are probably late thirteenth century in date. There is another painted panel, now in the vestry at the east end of the south aisle, but of later date. The pulpitum, 6 ft. 6 in. in width, has a central entrance and two staircases leading to the loft over. There are two ogee-shaped openings on the stairs looking eastward, and on the north side of the entrance on its west face, is a small recess about 1 ft. in depth. The upper story projects about 6 in., and exhibits many evidences of having been built up with material from other parts now destroyed. The upper part of the western wall is largely composed of panelled and painted masonry, mutilated and for the most part inverted, and on the east side is a row of painted shields, which corresponds with the description of work formerly in the south transept and now destroyed. The side screen walls of the choir behind the stalls were, as already noted, pierced with arcading, during the restoration by Sir G. G. Scott in 1865. They are finished with a gabled coping somewhat similar to the side screens at Tintern Abbey. The sedilia on the south side of the altar are three in number. The pinnacles and upper parts generally have a good deal of modern work introduced. Their original condition is shown in a plate of details in Hutchins' "History of Dorset," vol. iv.

The aisles are a little over 13 ft. in breadth, and are lighted throughout by three light windows. The clearstory of the choir and presbytery has three light windows in the broad bays, and two light windows in the narrow bays, and high up in the east wall is a window of seven lights. At the east end of the north aisle are one or two interesting monuments, described later. In this aisle are three doorways. The one in the easternmost bay is probably post-Reformation, and there is a corresponding one on the south side (see view). In the fourth bay is a doorway opening outwards, which led into a



has now disappeared. The monuments existing consist principally of grave slabs. One in front of the altar steps has the matrix of an abbot's brass and a marginal inscription: ABBA : WALTERE : TK : FATA : CITO : RAPVERE : TE : RADINGA : DEDIT : SED : MORS : MALE : NOS : TVA : LEDIT. There was an abbot Walter de Corfe, 1273, and another Walter Archer, 1392-1417. The slab more probably commemorates the former.

Further west, in the middle of the second bay of the choir, is a large stone, now devoid of ornament, possibly having been reversed at the restoration. Two are mentioned by Hutchins in this position, "in the passage between the chancel and choir." In the eastern bay of the north aisle is a brass to a monk: "Hic jacet Johes Artur hui loci monachus cuius anime ppietur deus. Amen." Against the east wall is the monument of the Bancks family, and on the south side a canopied monument of Purbeck marble, with a brass of Sir John Tregonwell, to whom the abbey was given at the Dissolution. It bears this inscription: "Here lyeth buried Syr John Tregonwell knight doctor of the Cyvill Lawes and one of the maisters of the Chauncerie who dyed the xiii day of January in the yere of our Lorde 1505 of whouse soule God have mcy." Sir John is represented in a tabard kneeling at a prie Dieu, and at the sides and above the effigy are three shields of arms. In the north transept is an interesting example of an incised slab, with the lower half of the effigy of an abbot and a marginal inscription: (ME)RCI : LISET : LE : PARDVN : ICI : W.S. : RI : PAR : ICI : PASSET : PVR : LEALME : PRI. The initials W.S. are probably those of the abbot. There were two abbots, Wm. de Stokes, elected 1222, and Walter de Sudelynge, 1292, to either of whom this slab may belong. It was found at the time of the restoration at the west end of the south aisle. The Damer monument in the north transept is by Carlini, and the whole of the transept is raised one step, and the pavement composed of marble. In the south transept is a modern font, quite out of keeping with its surroundings, and the upper part of a figure of St. James said to have come from the parish church.

One of the most interesting possessions of the abbey church is the "tabernacle," a very beautiful piece of Perpendicular woodwork, now placed against the west wall of the south transept. Its original use is generally considered to have been for holding the pyx, although the interior bears evidence of its having once been used for bells. The general design is shown in the sketch. It is in three stages, the lowest square on plan, the two upper ones hexagonal, the whole surmounted by a spire. Two large irregular holes are still to be



seen in the centre of the front of the altar screen, which was its probable position. In 1781, according to the Rev. Thomas Warton, it appears to have been divided, part of it being in the transept, and part on the north side of the altar. It has been elaborately coloured, chiefly in red and green, with a powdering of roses in places.

There are a few fragments of old glass in the east window, and some old quarries in the westernmost window of the south aisle of the choir.

The present abbey house, built by Sir Wm. Chambers, incorporates the Old Abbot's Hall, apparently built by Abbot Middleton. On various parts of the room, on the cornice and screen chiefly, are shields of arms, the arms of the Abbey, and initials, rebus, and mitre of Abbot Milton. On another is the date 1498. A fireplace has been inserted on the south side, otherwise the room remains in good preservation.

The parish church of St. James stood a little distance south-east of the church, but the village and church were rebuilt outside the park about a mile distant, and the site alone remains.

A short distance east of the church, on the side of the hill, is the ancient chapel of St. Catherine. It consists of a nave and chancel, and the main walls are Norman. Later additions have been made to it, and the west front cruelly spoiled by being rebuilt in attempted

imitation of Norman. On the west jamb of the wall door, which is Norman, is a fragment of an inscription:—

INDULGENCIA : W : SCI : LOCL C : : X.DIES. :
In the floor of the chancel are a number of encaustic tiles, removed here from the abbey church. There are a large number of different patterns, some of the best being here illustrated. Among the armorial tiles are the arms of Clare, Bigod, three lions passant, a shield vair, another cheque, three swans, a cross between four lions rampant, within a bordure engazled, the arms of the See of Exeter (the crosskeys and sword), two tiles manufactured at Malvern, one with an inscription and date 1450, and the second a four-sided pattern with the arms of Clare. Besides these there are two knights on horseback (one with a spear, the other with a sword), a stag and hound, a dog in front of a tree, two birds, a star with six points, and several examples with conventional and foliage patterns. There are some border tiles with embossed patterns.

At Hilton church, north-west of Milton Abbas, are several panel paintings, with saints, removed from the abbey church, apparently at the time of Wyatt's restoration, and at Bingham's Melcombe church are several fragments of glass, said to have been brought from Milton.

The church was dedicated to St. Mary, St. Michael, St. Sampson, and St. Branwalader.

The arms of the Abbey were *sa*, three baskets with loaves of bread, *or*. The original number of monks is said to have been forty, but at the Dissolution the number had decreased to twelve.

The materials used in the abbey church vary, and this variation is largely a guide as to date. The whole of the eastern area (choir and presbytery) is chiefly of Portland stone, with an admixture of flint in the aisle walls. The south transept is the same, but with a good deal of Ham stone introduced. The later portions of the building are almost entirely of Ham stone—the transept, crossing (w. piers), and tower; and also the additions and alterations—such as parapets and pinnacles—made to the choir and presbytery. The interior is very striking in this respect, the eastern piers of the central tower being of Portland, while the western piers are of Ham stone. Ham stone occurs certainly in the jambs of the clear-story and aisle windows, but it may possibly have been later work inserted.

NEWGATE PRISON.

As this remarkable building will shortly, and of necessity, disappear—for it could be used for no purpose but a prison, in which respect its interior arrangements are out of date—we have thought a good record of its appearance would be of permanent value. Mr. Curtis Green has produced a fine drawing of it, which we are sure our readers will be glad to have.

We gave measured drawings of the building, by Mr. G. J. Lacy, and some account of its history, in our issue of December 21, 1895. Mr. Green wishes us to add that he has been most assisted by Mr. Lacy's drawings in making the present perspective view.

VIEWS OF OLD WESTMINSTER.

THESE views are given in connexion with the article on "Old and New Westminster," published in this issue, and are nearly all referred to there.

The view of "Rural Millbank," as it appeared at the beginning of last century, is from a pretty water-colour drawing in the Crace collection. That of Millbank Penitentiary is from an engraving made probably shortly after the Penitentiary was built. The sketch of the buttress of Westminster Hall, as it appeared when Soane's Law Courts were cleared away, was made at the time by Mr. W. E. Drummond - Milliken. The other illustrations are all from lithographs or engravings in the Crace collection. They show New Palace Yard as it existed early in the century, with the coach of the period also; Labeley's old Westminster Bridge, removed in 1861; the doorway of Old Bridewell, as it stood as a relic in the middle of a garden, subsequent to the demolition of the prison; the exterior of the "Painted Chamber" where once the House of Lords met; the Houses of Lords and Commons as they appeared before the fortunate fire which cleared the way for the present noble structure; and the cloister court east of Westminster Hall, as it appeared after the fire. On the right is seen the buttress which Barry cut away in carrying out the Houses of Parliament.

THE PORTAL OF THE NEW CENTURY.

It occurred to me that the entry on the new century might be architecturally symbolised by the idea of a vast hall of Cyclopean dimensions, beyond which the bridge into the future stretches towards the sunrise.

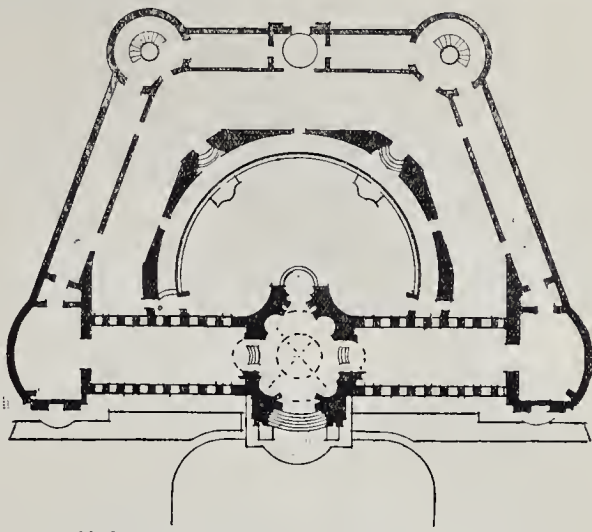
The sub-title, "An Extempore Fantasy," is a mere expression of fact, inasmuch as it was built up extempore on the paper without even a preliminary sketch—an "essay in the intervals of business," and must be taken as such.

H. H. S.

THE SMALLER ART PALACE ON THE CHAMPS ELYSEES, PARIS.

We give two illustrations, from photographs specially taken for the *Builder*, of M. Girault's beautiful building on the Champs Elysees, known as the "Petit Palais," so called in contrast with the still larger palace opposite, though in reality it is anything but a "small" building.

The one view shows the principal façade facing the Avenue to the bridge; the other shows the interior of the semicircular court,



The Smaller Art Palace on the Champs-Elysees, Paris. Plan.

perhaps the most charming portion of the architecture. The plan appended illustrates the arrangement which is the basis of the whole conception; the semicircular internal court with the double suite of galleries on a semi-hexagon plan outside it, the sides of which form tangents to the circle.

The building was described at length, in regard to its ornamental details and sculpture, in an article on "The Two Art Palaces of the Paris Exhibition," in our issue of June 16, 1900.

THE HEART OF ROUEN.

THIS drawing, which was sketched upon the spot a few months back, is taken from a window of a house upon the quay. It represents the most ancient part of that remarkably interesting city as it is at present (factory chimneys, iron spire, and all). The foreground shows the various old streets which form a kind of network of ancient houses and buildings between the Halles and the Rue Grand-pont. The houses are interesting examples of timber construction coated all over with slate very ornamentally treated. Viollet le Duc, in his "Dictionnaire," gives examples, under the heading "Ardoise," of this form of slate-casing, so common in this part of Rouen. It is somewhat curious that, although these houses have highly-ornamental gables, towers, and richly-carved corbels, no decoration of any kind is to be found on the chimneys, which are perfectly plain. The streets, &c., shown in this view are the Rue du Bac, the Rue des Halles, Rue de la Savonnerie, Rue de l'Épicerie, and the Rue Potard. Part of the buildings of the Halles are shown to the extreme left, but the curious Renaissance building called "Haute Vieille Tour" is not visible from this point of view.

Andrea Cook, in his charming "Story of Rouen," points out a great peculiarity of this part of the city. The streets all run *up* to the quay and not down to it, and as the Cathedral is on a hill, the whole district forms a valley, and it seems as if it must formerly have been covered with water and the river banked up at some time; or was there a *second* island between the original shore and the Ile Lacroix? This sinking of the land is distinctly visible in our view, and throws into prominence the Cathedral and St. Maclou whereas St. Ouen, which is the loftiest church of the three, being below the brow of the hill and on the opposite bank of the Robec, is less conspicuous. That eccentric little river almost turns a right angle under the Rue d'Amiens, and flows at the back of the Rue Damiette, after which it disappears. All this part of the city, when seen from a height, looks a bewildering maze of lanes and houses, which, together with the three magnificent churches, form a picturesque group such as is scarcely to be equalled anywhere else in Europe. Not only is the general view so fine, but when we examine it in detail we shall find such streets and houses as

delighted Prout and Coney. The Rue de l'Épicerie, the Rue du Bac, the Rue de la Savonnerie, the Rue Damiette, and "Eau de Robec" are specially rich in old carved and slate-fronted houses. The tall slate-covered towers are very singular features in the Rouen houses. One does not notice them so much in passing along the streets, because they are generally in the courts at the back of the houses.

Alas! what is to become of all this maze of picturesque but dangerous and insanitary dwellings—this "dream for the artist," but nightmare to the unfortunate Town Council of Rouen? The great danger is fire, the less "demolition!"

When, however, that demolition takes place we do trust that it will not be carried out with that total disregard of everything ancient which characterised the construction of the Rue de la République and some other new thoroughfares in Rouen; and one is glad to notice that in the rebuilding of the Hotel of the Crescent, "Cour des Comptes" (an eighteenth-century structure), the old sixteenth-century doorway and beautiful Early Renaissance cloister have been saved, which gives one a hope of better things for the future.

The last of the old timber houses touching the Cathedral buildings is coming down; it is in St. Romain-street, and is interesting. We cannot, however, blame the Town Council for removing these houses attached to the churches, as the danger from fire and the insanitary conditions created by such buildings are too serious to be neglected, even for the cause of picturesqueness.

H. W. BREWER.

ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION OF IRELAND. — On Tuesday, the 18th ult., Mr. Charles J. MacCarthy, City Architect of Dublin, delivered a lecture entitled, "Some Intentional Irregularities of Italian Mediæval Architecture." The lecture dealt in detail with a number of instances of structural irregularities in Italian mediæval churches. These irregularities were apparently first noted in modern times by Mr. Goodyear, an American architect, who attached so much importance to his inquiry that, assisted by a surveyor and a photographer, he entered on a regular course of inquiry, the results of which he duly published. These came under the notice of Mr. MacCarthy, who took the opportunity of inquiring personally into the matter by a couple of visits to Italy, with the result that he has become convinced of the correctness of Mr. Goodyear's conclusions—namely, that these so-called irregularities are absolutely the result of deliberate intention, and not due to constructive unskillfulness. The irregularities to which Mr. MacCarthy called attention take such forms as the narrowing of the nave

towards the east—the inclination diagonally of the central axis of the church—in some instances to so great an extent as 8 ft. by actual measurement; and in other instances a perspective reduction of the lines of the nave arcade by a continuous narrowing of the spans of the several bays, and curious to note such reduction is seldom regular, but on the contrary extremely unsystematic to all appearance. For instance, we get three or four bays regularly diminishing in span, and then a wide bay—wider than any other, perhaps. This is often held to prove that the irregularities were not the result of deliberate forethought, but rather of accident. Mr. MacCarthy strove to show this to be further proof of artistic feeling, which disdained a purely mechanical reduction. The lecture was illustrated by a large number of diagrams.

DIARIES, &c., FOR 1901.

MESSRS. HUDSON & KEARNS (83, Southwork-street, S.E.) have sent us specimens of their architects' and builders' diaries, and their special diary blotting-pads, all of which we can recommend for usefulness and neatness. The architect's diary is issued in two sizes, numbers 12 and 13, the only difference apparently being that No. 12 has, in the diary proper, one page to a day, while No. 13 has two. They contain, in addition to information usually to be found in a diary, some cases of interest to the profession decided in the Courts of Justice during the past legal year; a list of Metropolitan District Surveyors and districts, with official and private addresses; regulations and rules as to applications to the London County Council under the London Building Act; a list of some architectural, surveying, and engineering institutions, with their presidents and officers, &c. The builder's diary, No. 11, has two days to a page, and contains a series of useful tables for builders, including a wages table, a form of ready reckoner for carrying out estimates, checking invoices, &c., and tables for the valuation of property, leases, life interests, insurances, &c. Messrs. Hudson & Kearns' diaries need no recommendation to those of our readers who have used them; they are admirably arranged and printed, full of useful information, and leave little or nothing to be desired. As to the blotting pads, No. 8A and the banker's pad are specially good specimens.

"Sprague's Pocket-Book and Architects' and Surveyors' Memorandum" for 1901 is the thirty-second annual edition, by Messrs. Sprague & Co., Limited, 4 and 5, East Harding-street, Fetter-lane, E.C., of a useful and well-arranged little diary. The information for architects, surveyors, and others is put in a very concise way.

"The Architects' and Surveyors' Diary for 1901," published by Messrs. Waterlow Brothers & Layton, Limited (24, Birch-lane, E.C.), contains much information useful to architects, surveyors, and others. Besides the usual features of a diary, the work contains lists of members of the R.I.B.A., the Surveyors' Institution, Institution of Civil Engineers, and other bodies, a digest of the principal acts relating to buildings, &c.; conditions and contract on taking building land; general conditions for building contracts; professional practice and charges of architects, &c. The work is neatly bound and got up.

The first year's issue of "Knowledge, Diary and Scientific Handbook" (High Holborn) comes appropriately at the commencement of the new century, and gives promises of many future issues. The scope of the work is mainly astronomical, but its usefulness is not confined entirely to science, as some of its features will be useful for workers in other branches of work. The diary includes:—An Historic Summary of the Advance of Science in the Nineteenth Century; Astronomical Notes and Tables; Twelve Star Maps showing the Night Sky for every Month in the Year; Tables of Tides and Tidal Constants; Original Descriptive Articles on the Tides and Terrestrial Magnetism; A Calendar of Notable Events; Photograph and Detailed Description of the Gigantic Telescope exhibited at the Paris Exhibition; an essay on the Uses of Knowledge; The Constituents of the Sun; The Hundred Brightest Stars, with a Table of Principal Observatories of the World; List of Principal Refractors of the World; and Monthly Astronomical Ephemeris. The diary portion gives a page to a day. The work

is very neatly got up, and will certainly prove a useful book of reference as well as a well-arranged diary.

"The City Diary for 1901" (W. H. & L. Collingridge, 148, Aldersgate-street) is the thirty-eighth year of issue of a most useful work of reference to everyone interested in the local government of the City. A complete list of members of the Corporation, with addresses, is given, and particulars of the City Companies are set out, and other information useful to City people and others is given. The diary portion is well arranged, and is interleaved with blotting-paper.

"The Railway Diary and Officials' Directory for 1901" (McCorquodale & Co., Limited, Cardington-street, Euston-square) and a copy of the "Railway Almanac" have been sent us—both useful issues. The diary is full of information and statistics relating to railways.

"The Mechanical World Pocket Diary and Year Book for 1901" (Emmott & Co., Limited, New Bridge-street, Manchester) is the fourteenth year of publication of a cheap, neat, and handy little diary. The diary portion is somewhat limited, the greater part of the work being taken up with useful engineering notes, rules, tables, and data.

"The Gloucester Diary and Directors' Calculator for 1901" is the sixth year of issue of a work published by the Gloucester Railway Carriage and Wagon Company, Limited. It contains a list of stations and junctions attended by the company's wagon repairers, with names and addresses of the repairers.

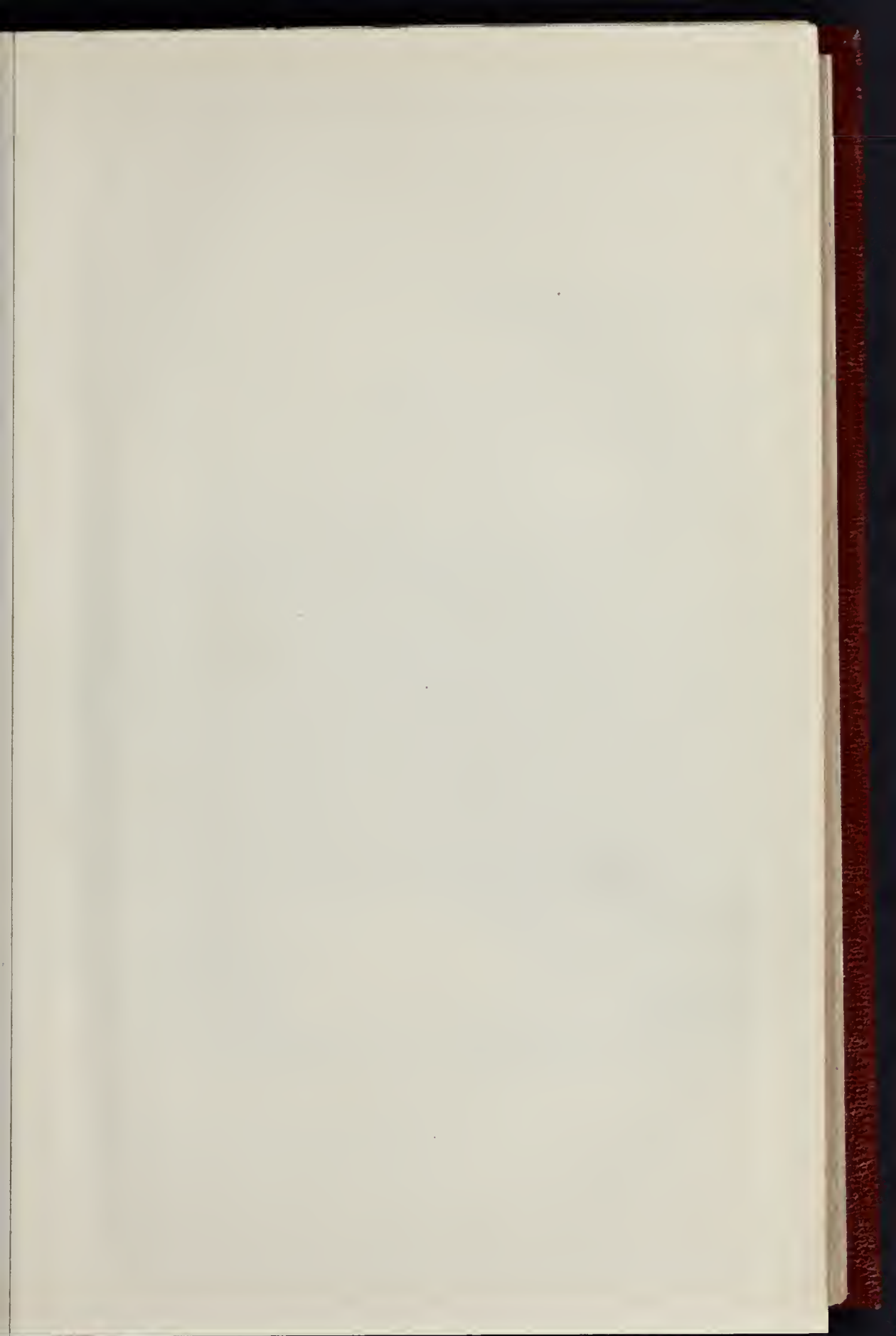
Messrs. Benrose & Sons, Limited, 23, Old Bailey, E.C., have sent us several of their daily calendars—Shakespearean and Proverbial—which are excellently got up and suitable for use in the office or home. The same firm also send us their monthly diary—the diary consisting of twelve parts, suitable for carrying in the waistcoat-pocket.

Messrs. Jonas Smith & Co., timber merchants, Belvedere-road, Lambeth, S.E., also send us their daily calendar, the date on which is very clearly printed in red.

TECHNICAL EDUCATION ON THE CONTINENT.

MR. JAMES BAKER, F.R.G.S., has prepared for the information of the Board of Education a record of the impressions which he formed in the course of a journey that he undertook through East Prussia, part of Poland, Galicia, Silesia, and Bohemia, with the special object of observing, from the point of view of one generally interested in the development of British industry and commerce, the progress of technical and commercial education in those countries. Describing first the Berlin Royal Technical College, Mr. Baker observes that the very building induces respect for industry and mechanics. It has a great and stately facade, and a hold flight of steps leading to its principal entrance, the great building stretching away 125 yards on either side of this entrance, the entire structure being 250 yards long and just 100 yards deep. There are working in this building over 3,400 students and Hospitanten, 140 professors, and 260 assistants. The subjects taught here are architecture and building engineering—that is divided into Tief and Hoch Bau, the Tiefbau dealing with what one may term ground engineering (railways, bridges, drainage, &c.), and the Hochbau dealing with above-ground building such as houses, towers, &c.—machine engineering (including electro-technical work), shipbuilding and marine engineering, chemistry, metallurgy, and general science (including natural philosophy and mathematics). The fees are arranged according to the lectures attended and practical work undertaken, students paying for lectures 4 marks (*1 s.*), and for an hour's practical work 3 marks, whilst the free-lance students called Hospitanten pay 5 marks for lectures and 4 marks for practice. The classes from which the students are drawn are very varied; the poor lad who has gained a scholarship, or stipendium, as it is called, may be working by the side of an admiral who agrees with the statement that one is never too old to learn. Of these scholarships for the assistance of poor or clever students the school possesses a very large number, nearly a hundred in all; and many Prussian scholars who are poor but able are freed from paying the school fees, and a goodly number of the scholarships also carry with them this remission of the fees. It was interesting, Mr. Baker remarks in passing, amidst the orderly maze of class and lecture room, workshop and laboratory, and, above all, through the model or museum rooms, to note the extreme order that prevailed in all departments. In the great hall the frescoes are illustrative of the building and engineering arts, the two at either end being powerful and realistic studies by Ernst Hilkmant; one a painting of the Greek builders work on the Acropolis, the other the scene of the building of a modern iron bridge;

the other frescoes are of Rome, Philæ, &c. The next largest hall is devoted to the reading-room, and this adjoins the great library, wherein are 75,000 volumes, from the sets of folios with plates dated upon artistic or scientific subjects to the Transactions of American scientific societies of to-day. In the reading-room are foreign papers in all tongues, and thus the student is in contact with the art and science of the world. There are twenty different museums in the school. In the Building Museum are examples of the sets of folios with plates of the quarries from whence they are obtained, and of all possible building material; and in the Architectural Museum are models of all parts of buildings and of the famous buildings of the world. In PRUSSIAN POLAND Mr. Baker visited the, originally, Royal Polish City of Posen, and made a close study of the new technical schools which he found pleasantly situated on the outskirts of the interesting town. The pupils enter at sixteen; there are four classes, and each class lasts for half a year with twenty lessons, but as the pupil is on practical work during half the year he is twenty when he has finished the course. The fees are 80 marks (4*l.*) for the half-year and 20 marks (1*1*l.) for materials, pupils proving themselves with German, French, English, and water-colours. Lodgings are arranged for the pupils at a fixed rate for board and lodging of 40 to 60 marks a month. A certain number of poor students are excused a part, or even all the fees; but a proof of need, of intense diligence and capacity from former schools, such as the Volksschulen, must accompany any application for such exemption. At the end of each half-year the pupil receives a certificate of the result of his work, and on his passing out of the first or highest class an examination is held, and those who pass receive a diploma from the Royal Examination Committee, which is accepted by the master builders and architects as a proof of the knowledge their code demands; it also suffices for securing Government situations in the building department and in the Tiefbau department, *i.e.*, positions on the canals, railways, roads, &c. The programme of work is, shortly, as follows:—For the fourth, or lowest class, German language two hours a week, especial attention being given to building and business work and the important points in connexion with post, telegraph, telephone, and railways. Arithmetic and algebra have respectively two and four hours per week; mensuration of plane figures, four hours; natural philosophy, two hours; practical geometry, four hours; building construction, introducing every type of separate portions of buildings, and their construction in stone and wood, sixteen hours per week; to the elements of form, proportion, &c., four hours; to freehand drawing, four hours. The third-class gives three hours to algebra, four to trigonometry and stereometry, two to natural philosophy, three to the study of building material, four to practical geometry, four to statics, and twelve to building construction in stone and wood. These latter twelve hours are sub-divided thus:—Form: Joints and braces in stone, wood, and iron, and study of the columns of the Renaissance, simple facades, four hours; freehand drawing, simple ornament, parts of buildings from models, and practice in sketching—four hours; building knowledge or architecture, planning simple buildings and studying the principal laws affecting buildings—four hours. In the second-class two hours per week are given to natural philosophy, especially the uses of magnetism and electricity in connexion with the building art, and four hours to practical geometry. Then comes Festigkeitslehre, or the strength of form and materials, to which five hours are given; whilst to practical work—building construction that now advances to stairways, foundations and their difficulties (such as piling dams, &c.), pillars, joints, and the interior work (such as the carpentry and Locksmith's work, doors, windows, and wall decorations)—to this, as always, the most time is given, *viz.*, twelve hours. Then come architectural plans and designs for simple town houses and the essentials of farm building—five hours. In this second class also appears for the first time the Entwurfen, or designing, of which so much is made in all these schools at all grades. At the start plans are to be drawn of simple buildings; houses for artisans, or for the minor officials, small houses detached or connected with others, village schoolhouses, or the dwellings of a village pastor, the principal stress being laid on the details in working out the construction, and upon the most suitable forms taken in connexion with the class of material used. The pupil also has to sketch out working plans of the details of the sketch. Eight hours a week are given to this, and two hours to valuations, quantities, costs, &c. Then come studies in form, sketches, and designs of balconies, oriels, &c., gables in various materials—four hours; measuring and levelling—two hours; whilst modelling is introduced according to the discretion of the director. In this class is likewise introduced the ambulation or first-aid instruction, and twelve hours during the half year are given to this very helpful knowledge. In the first or highest class some time is given to a repetition of the foregoing work, the work being carried forward to more elaborate examples. Most time, *i.e.*, fourteen hours a week is given to designs and plans of all types of building save the highest, such as churches—these do not come within the





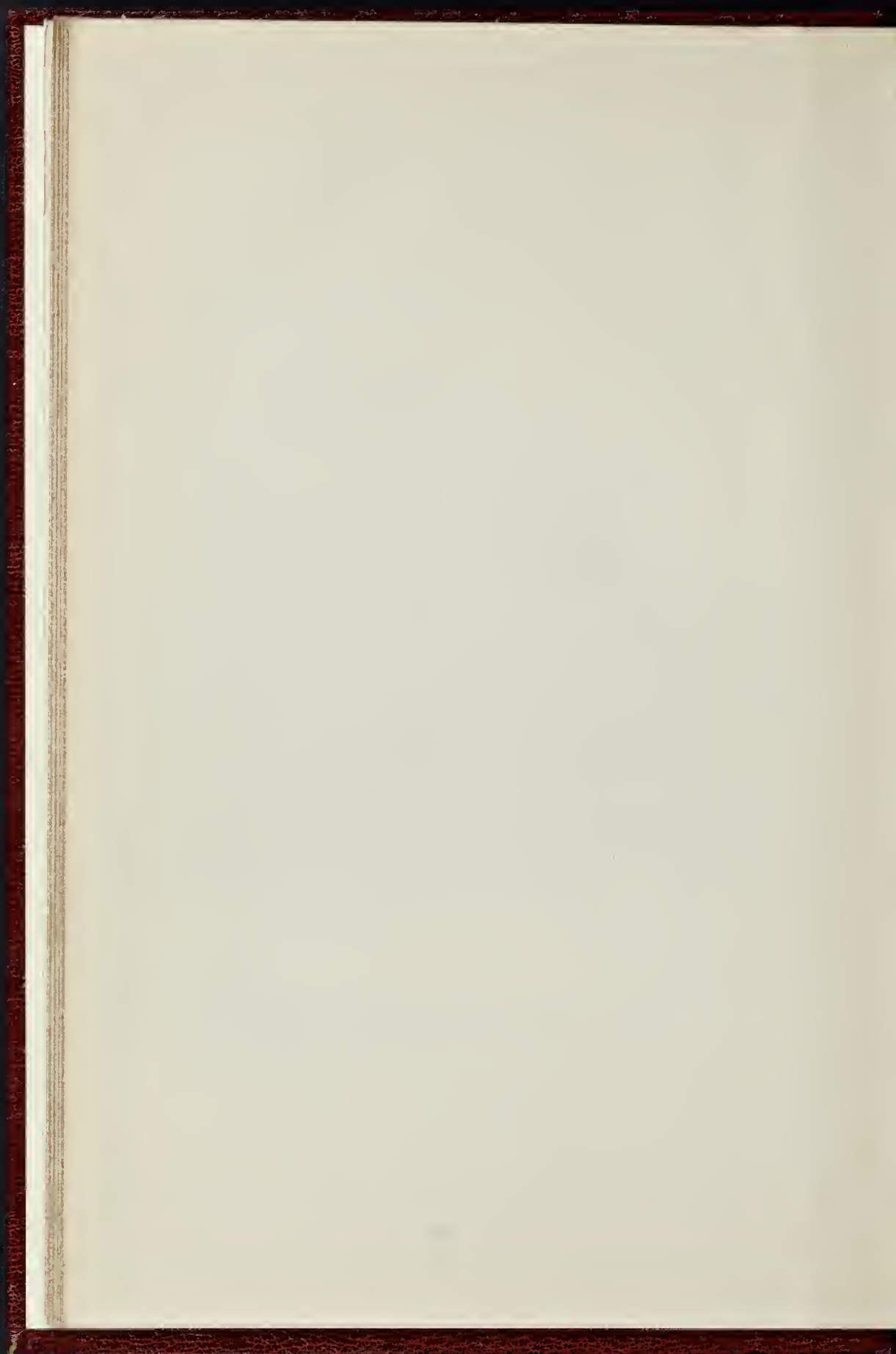
NEWGATE PRISON SHORTLY TO BE DEMOLISHED. BUILDING FROM A DRAWING BY

RY 5, 1901.



PHOTO-LITHO SPRAGUE & CO. LTH 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

FROM THE DESIGNS OF GEORGE DANCE, R.A., ARCHITECT.
BY W. CURTIS GREEN.



scheme of this grade of school. Cost and measurement and quantities are exactly dealt with, and two hours a week are given to the laws and police regulations touching building, and one hour a week to special book-keeping suitable to a builder's work. The course for the Tiefbau—or, as one may term it, the ground-building course—for the first two (fourth and third) classes is the same as for the Hochbau course, and then it develops into the special subjects required by the pupils for their special work. Special time is given in the second class to durability and resistance power of the various materials and various forms of structure, also such subjects as subterranean buildings, roads, wear and tear, water-dams, bridges, railways, general drainage and irrigation works. Likewise in the first class hydraulics are taught with special attention to the pressure of water in drains, canals, and rivers; and eight hours are given to what is termed Wasserbau (waterworks) dealing with canals, sluices, dams, the supply of water to farms, drainage of the same, &c. The thoroughness of this plan, Mr. Baker suggests, will be at once seen, the only doubt that will occur to the mind being: Can all this be really learnt in the four half-years? but on going over the work actually in progress or accomplished in the school, he concluded that the work was being thoroughly learnt and understood. In the first class, for instance, were men of from eighteen to twenty years of age working upon roof construction, with details of wind and snow pressure and weight bearings. Others had a plan given them of a certain type of house, and then the pupil has to work out all details and create a design. The ground plan, floors, rooms, facade, doors, and windows, all have to be worked out to scale, and an effective design given for the whole building. In each class, according to the grade, Mr. Baker found this thorough type of work was going on—sometimes drawing from models, at others creating designs.

TRADE CATALOGUES.

MR. H. BURMAN sends us his No. 5 catalogue of wooden moulding sections, including also turned balusters and newels. We do not care for the newels, except No. 21, which is the best (well-designed newels are among the greatest rarities); but some of the balusters are very good and rather new in form. The sections of mouldings, which are numerous and well varied, are given full size.

We have received from the Welsbach Incandescent Gas Light Company a catalogue of burners and fittings for the illumination of streets and public places by incandescent gas light. The catalogue is profusely illustrated, and the so-called "shadowless" form of lantern and column is a marked improvement on some of the older forms of lantern. The great reductions which have been made in the prices of the commonest forms of burners and mantles must tend to increase greatly the popularity of the Welsbach system of lighting if the reduction in prices has not been effected by a reduction in the quality of the materials supplied.

Messrs. Lockerbie & Wilkinson (Birmingham) send us an illustrated pamphlet of their "autolite" portable acetylene industrial lamp. This lamp ought to prove useful for many industrial applications. It gives a brilliant light of 50 c.p. for eight hours with a charge of one pound of carbide. It can be extinguished and relit when required, and contains no mechanism that could get out of order. The makers claim that it is cheaper, simpler, safer, and cleaner than any oil lamp.

Messrs. Redpath, Brown, & Co. (Edinburgh), send us their new section book of steel girders, stanchions, and columns, calculated and arranged by Mr. Alexander Drew, M.I.Mech.E., Part I., referring to girders of different kinds, contains an introduction wherein the physical properties of the material are stated, together with formulas, by the aid of which safe loads may be calculated. In the tables of safe distributed loads for various types of girders, clear indication is given of the loads which are likely to produce greater deflection than is permissible in ordinary buildings. Some practical notes and sketch suggestions form the conclusion of the first section. Part II. treats of columns in a generally similar manner, and taken as a whole the book may justly be regarded as a most useful addition to mercantile literature.

We have received from Messrs. Merryweather & Sons their catalogue of the "Hatfield" pump, with illustrations showing its application to different requirements. The pump has three barrels arranged radially round a direct-driven shaft, and in principle resembles an inversion of the well-known "Brotherhood" engine.

Messrs. John Blake (Accrington), send us a

catalogue of Blake's self-acting hydraulic rams, in which are wood cuts illustrating some of the many uses to which these rams are applicable.

We have received several illustrated circulars from the Consolidated Telpheage Company of New York describing rapid and economical methods of transporting materials by means of what is practically a miniature overhead electric railway. They prove that in many cases great economies can be effected by this means, and it seems particularly adapted for conveying agricultural produce from farms to the nearest markets at cheap rates. For work in quarries, mines, blast-furnaces, factories, &c., it might also be useful, and those interested in the transportation of materials would do well to consider the telpheage system.

The "Warrington" Bond-iron Syndicate send an illustration and description of their wall-ties, which are formed from a length of iron wire shaped into a double loop and the ends twisted together in the centre; for cavity ties there is a long twist bridging the cavity, the loops going into the brickwork. In the case of cavity-walls this tie has the advantage that it presents only the smallest possible surface in the cavity. The makers state that it obviates the necessity of cutting or clipping the bricks, as "it can be bent to fit into the courses," but that somewhat injures its quality as a tie. It has, however, a great deal to recommend it. The ties are coated with a protective against oxidation.

Messrs. Chubb & Son send us a pamphlet describing the almost sensational test of one of their safe-doors by the firing of a 100 lb. "armour-piercing" steel shell at it at a range of 50 yards. The door was practically uninjured (as shown by a photograph), and the shell smashed up. The material of the door was the latest form of hardened "Harveyed" steel. There is also an illustration of the treasury-door made from this artillery-tested plate. We take the following from the pamphlet:—

"The door has no handles, screw holes, key, nor spindle holes; nothing can be taken off or removed from it, for there is nothing on it to remove; and as there are no holes nor the beginnings of any, nitroglycerine or dynamite cannot be introduced. In this respect, viz., being absolutely solid, it is believed to be unique as a door. It presents a plain front to the worst and best of burglars, giving them no point for attack. Steel that has withstood the impact of a heavy steel projectile from a 6-in. gun at point blank range cannot be touched by punches, drills, or chisels."

The first step towards opening the door is to find a tiny keyhole in the side of the frame surrounding the door. Into this is introduced a very small key, so small that it can be mounted in a finger-ring. This opens a little cupboard in which is discovered the dial of a keyless combination lock and the squared end of a rod or spindle upon which a loose crank handle can be fitted. By turning this rod it is possible eventually to undo the main bolts of the door, but at first the rod goes round and round without doing anything, turning with equal freedom in both directions: it is, in fact, out of gear, and it can only be put into gear—thus establishing its connection with the main bolts of the door—after the keyless combination lock has been worked. This lock is set to open upon predetermined numbers selected between 0 and 100 by the owner, and known only to him. Even if the knowledge of the correct numbers by which to open the lock leaks out, it would be of no practical value to a burglar, as the safety of the door does not rest upon this one little lock. When the spindle connexion to the bolts has been established by means of the internal clutch which the keyless lock controls, the spindle is free no longer: it is geared up to the boltwork.

The fastening of the door depends primarily upon twenty massive bolts, and these in turn are governed by a quadruple timelock. When this 'timer' is on guard the bolts cannot be moved inwards—that is to say, the door cannot be opened. But when at the predetermined hour the 'timer' has gone off guard, then, by means of the crank handle on the spindle end, the bolts can be withdrawn from the bolt-holes.

There is no handle by which to pull the door open, but in the floor outside will be seen the top of a small crank with a socket or hole into which a lever is put and pulled over. A simple but secure arrangement of links and levers from the crank brings pressure to bear in an outward direction upon the bottom of the door, and thus it is pushed open from the inside."

This door certainly seems to have attained the perfection of security as a safe-door.

Mr. T. Potterton (Balham) sends us illustrations of his patent zig-zag range boiler for warming houses in connexion with domestic supply. This is made in two E sections, which tooth into each other, leaving sufficient space for fire-way between. It is obvious that such a

boiler is very economical of fuel in proportion to the work done. The same sheet shows an illustration of Potterton's indicating safety valve for boilers. The spindles of the valve are made of strong brass tube instead of a solid rod, so arranged that water can be drawn through it from the seating of the valve. If this can be done it proves that the valve is free from incrustation, otherwise the hole at the bottom of the spindle would be stopped and no water could be drawn. Both spring and dead-weight valves are shown; but the latter are far preferable; a spring alters with use, a weight does not.

Messrs. Shanks & Co. (Barrhead) send an illustration of a bath with Pirie's patent swivel tap for drawing-off water. This is a convenient arrangement by which the tap nearest the outside of the bath is made with a turning bib or nozzle, so as to discharge either into the bath or into a pail or other vessel placed outside the bath. The arrangement is patented by an architect, Mr. Pirie, of Aberdeen.

Messrs. Waygood & Co., Limited, send us their newly-arranged catalogue of lifts and hoisting machinery. A noteworthy feature of this book is that exact dimensions and other useful figures are given relative to the appliances described.

BOOKS RECEIVED.

EGYPT EXPLORATION FUNG: ARCHEOLOGICAL REPORT, 1899-1900. Edited by F. Ll. Griffith, M.A. (Kegan Paul, Trench, & Co.)

THE APARTMENTS OF THE HOUSE. By Joseph Couch and Edmund Butler, architects. (The Unicorn Press.)

LONDON COUNTY COUNCIL: THE HOUSING QUESTION IN LONDON. Report Prepared by the Clerk to the L.C.C. (P. S. King & Son.)

Correspondence.

To the Editor of THE BUILDER.

ROOFS OF FARM BUILDINGS.

SIR,—With reference to Mr. Walmisley's paper read at the Surveyors' Institution, and also to Mr. Mann's communication in your issue of December 15, we are constrained to admit, although we are large manufacturers of corrugated iron, that as a roof covering it cannot compare in appearance with thatch or with tiling.

Its durability, however, in the pure atmosphere of the country, is undoubted; and while farmers and landowners are bound to study the utmost economy, we suppose corrugated iron will still form a not unimportant feature as a covering material.

We did, however, some time ago, having in view its plain appearance with the ordinary corrugations, introduce a section which we named our "Canadian" pattern. It is quite as rigid as the ordinary corrugations and as easily fixed, is no more costly, and many of our friends have preferred this pattern to the common section. We enclose you a sketch of it.

FREDK. BRADBURY & CO., LTD.
*The roofing which our correspondents describe is made in this section

and would have somewhat the appearance of a lead roof with rolls. We quite agree that it is preferable in appearance to the ordinary corrugated iron.—ED.

THE BELFAST PRESBYTERIAN ASSEMBLY HALL COMPETITION.

In reference to this competition, which has been the occasion of a great deal of discussion, the Council of the Royal Institute of British Architects has addressed the following communication to the Committee of the Presbyterian Assembly at Belfast:—

"9, Conduit-street, London, W., December 20, 1900.

Presbyterian Assembly Hall, Belfast.

DEAR SIR,—The Council of the Royal Institute have had their attention directed to the competition for the proposed new Presbyterian Assembly Hall, Belfast, and have carefully considered the whole question. In view of the unsatisfactory termination of this competition, and especially in view of the appointment as architect for this building of the firm responsible for the original objectionable conditions, the Council are of opinion that the only proper course to have been adopted was either to have appointed Mr. Rupert Savage as architect in conjunction with a consulting archi-

fect, as suggested by himself, or to have inaugurated a new competition with conditions drawn up by an experienced assessor.

My Council hope that the Assembly's Committee may yet see their way to adopt one of these courses.—Yours faithfully,
W. J. LOCKE, Secretary.

The Student's Column.

SANITARY FITTINGS AND PLUMBING. I.—INTRODUCTORY.

SO many books have been written on the sanitation of buildings, that the student may be inclined to think that there is no necessity for a series of articles on sanitary fittings and plumbing. This view might, perhaps, be correct if sanitation were an unprogressive science, but this is not the case. During the last quarter of a century sanitary science has progressed by leaps and bounds, and it is still progressing. The books of twenty years ago are now practically useless, and probably twenty years hence the books of to-day will also have been relegated to the limbo of forgotten lore, or will have been edited and revised till they are scarcely recognisable. Every year our knowledge becomes more exact and more complete, and every year new fittings are invented and old fittings improved, so that all architects must be students so long as they remain in practice, or must be content to be dubbed "old fogeys" and to be pointed at as being behind the times.

The wonderful increase in our knowledge of the causation of many diseases is one of the most marked features of recent years, and although very much indeed has yet to be learnt, sufficient is known to admit of practical application with beneficial results. The germ theory of disease is no longer regarded merely as a plausible hypothesis, but is accepted as a fact which is becoming every day more significant. "Find the microbe" is the key to as many enigmas as "*Cherchez la femme*."

The important effect which in this one fact must have on practical sanitation has scarcely yet been sufficiently recognised. The aim of sanitary science must be to remove from buildings and their appurtenances all conditions which can contribute to the growth and distribution of pathogenic organisms, and, as far as possible, to provide those conditions under which such organisms cannot exist. This is a difficult problem, and cannot be solved until the life-history of every disease-producing organism has been thoroughly studied. Something in this direction has already been accomplished, but the knowledge which has been gained shows clearly that the solution of the problem will not be easy. Dr. Sidney Martin's experiments with the typhoid bacillus show that this soon dies in "virgin" soils, whether these are sandy or peaty, but that it rapidly multiplies in moist sterilised samples of soils from gardens and other cultivated places, and retains its viability and vegetative properties for months and perhaps years. Moist sterilised soil which had been impregnated with the typhoid bacillus was found to contain the bacillus at the end of 450 days. The soil was then naturally dried for forty-nine days till it "could be readily powdered into a fine dust;" the bacillus was still there. Other experiments showed that the bacillus spread through the soil in different directions.

Experiments with sterilised soils are, however, of little practical use. It is more important to know how long the typhoid bacillus can survive in soils containing other bacteria. No definite statement on this point can yet be made, but there is reason to believe that, while in many cases the typhoid bacillus may be overcome by the other bacteria in the general struggle for existence, in some cases it will live and retain its dangerous properties for months. In a recent report on "Enteric Fever in the City of Chichester," Dr. Theodore Thomson and Col. J. T. Marsh, R.E., came to the conclusion that the most probable cause of the repeated recurrence of enteric (typhoid) fever in this city is the foul condition of the soil, due to the "leaky cesspools and cesspits," which, until some three years ago,* formed the sole methods of disposal of all its excrementitious matters.

The lessons to be learnt from these and other investigations are that some pathogenic organisms are not by any means so short-lived as is

* This was written in 1899.

commonly supposed, that they may spread rapidly under suitable conditions, and that they may exist for a considerable time even in dust so dry as to be blown about by the wind. The degree of temperature at which most rapid growth occurs differs, but most bacteria develop at the temperatures which are ordinarily maintained in inhabited buildings, while some (among which the typhoid bacillus is unfortunately found) can, in the words of Dr. Newman, "withstand freezing for weeks."

Moisture almost invariably favours the growth of bacteria, but some species can exist for a lengthened period in a dry medium. Sunlight, on the other hand, retards the growth of bacteria, and is often positively fatal to them, particularly in the presence of oxygen.

The practical application of the knowledge gained by medical experts is the problem which confronts the sanitarian, whether he be architect or engineer, and in attempting to solve this problem, the importance of sunlight and fresh air must not for a moment be forgotten. These are the natural germicidal agents which he must endeavour to utilise to the best advantage. It is also essential that rooms containing sanitary fittings should be so constructed and arranged that they can be kept scrupulously clean with the least possible trouble. Accumulations of dirt or dust in dark, unventilated rooms generally constitute suitable soils for the growth of bacteria.

But however satisfactory the rooms containing sanitary fittings may be, greater danger will exist if the fittings themselves are not of a suitable character, and if the plumber's work in connexion with them is not properly executed. Untold harm has resulted from the fixing of water-closets and other fittings of faulty design by unskilled workmen under more or less ignorant supervisors. The harm has not always been confined to the occupants of the houses containing the fittings, but has often spread throughout the community. Many towns to-day are paying the penalty for previous misdeeds.

Even some of our health resorts have shown an almost criminal disregard of sanitary requirements. Two examples will suffice for our purpose. In his report (dated January 30, 1900) on "Epidemic Enteric Fever in the Borough of Falmouth" Dr. G. S. Buchanan writes:—"Excrement disposal is almost everywhere effected by water-closets. Most of these closets are provided with flushing-boxes or flush-tanks, but some 200 are without flushing apparatus. The latter 'hand-flushed' closets are apt to become exceedingly foul. . . . At the date of my visit the occupants of a few of the larger private dwellings in Falmouth were having their house-drains exposed for examination. In each instance where I had an opportunity of seeing these house-drains they were seriously defective; thus, joints of pipe-drains were leaky. . . . soil-pipes were inside the house and unventilated, sink waste-pipes led directly to the house-drains. . . ." In a later paragraph he says:—"Soil-pipes are habitually unventilated." . . . Much of the recent plumber's work which I saw also seemed unsatisfactory."

In March, 1899, Dr. Buchanan, after a serious outbreak of diphtheria at Tunbridge Wells, wrote:—"House-drains are rarely trapped from the sewer, and frequently they are ventilated only by means of rain-water pipes which open just below the eaves. Often, I was informed, waste-pipes opening within the dwelling are connected directly with the house-drain. . . . Within the smaller dwellings commonly the only drain is a sink-pipe, which discharges its contents outside the building over a bell-trap. These bell-traps are usually defective. . . . In houses of better class are occasionally found water-closets provided with objectionable D-traps, and soil-pipes of water-closets often are unventilated. As a rule in smaller house property each dwelling has belonging to it a water-closet placed outside the building. A majority of these water-closets are without apparatus for flushing; being of the 'hopper' type, and getting merely an occasional 'flush' from a water-can, they often become filthy. In one row of houses I found closets of this sort built in the basement of the house, opening into the kitchen."

These instances serve also to show that, however much knowledge of sanitary fittings

* In the next paragraph Dr. Buchanan modifies this statement by saying that "new soil-pipes have in most instances been provided with ventilating shafts." The italics are ours.

and plumbing there may be in the country, the practical application of this knowledge has been, and still is, far from adequate. Every architect, who has to carry out alterations of houses, meets many instances of glaring defects even in buildings which have been erected in recent years. These defects are often due to ignorance or carelessness, but in many cases the blame must rest on the owner of the houses, for having demanded cheapness (however nasty) instead of efficiency. The architect unfortunately has to deal with many clients of this nature, and is often thwarted in his endeavours to do good work, even though he points out that cheapness in first cost almost inevitably entails excessive expenditure in repairs and alterations, and perhaps in doctors' bills.

Statistics as to the incidence of disease in houses provided with water-closets and in houses with pan-closets or privies are somewhat misleading, but it is not going too far to say that water-closets appear to be in many cases even more dangerous than the conservancy systems. Thus, at Gainsborough, according to the report of Dr. Darra Mair, twenty-five of the houses invaded by fever during twenty months of 1897-8 were provided with privies, five houses invaded were provided with pan-closets, and sixteen with water-closets. As there were 2,455 houses with privies (either separately or in common), 305 with pan-closets, and 1,500 with water-closets, the incidence of the disease was as follows:—

In houses with privies.....	1 in 98
" " pan-closets..	1 " 61
" " water-closets	1 " 81

It is not surprising to learn that "in some of the latter houses gross sanitary defects had been discovered in connexion with the water-closets or the drains."

The following words by Dr. Farr, the eminent statistician, are worth careful consideration:—"Almost coincidentally with the first appearance of epidemic cholera, and with the striking increase of diarrhoea in England, was the introduction into general use of the water-closet system, which had the advantage of carrying night-soil out of the houses, but the incidental and not necessary disadvantage of discharging it into the rivers from which the water-supply was drawn." In London the mortality per 1,000 from diarrhoea was '215 in 1838, '201 in 1839, and '238 in 1840 and 1841, an average of '223. In 1849 connexion of drains with sewers was compulsory, and the death-rate from diarrhoea became 1705 in 1849, '813 in 1850, '085 in 1851, and '983 in 1852, an average of 1,140, or five times the death-rate from 1838 to 1841. The average for the decade 1871-80 was, according to Dr. Ogle, '940 per 1,000, or very little better than the rate for 1849 to 1852, and more than four times the rate for 1838-41. The number of deaths from diarrhoea in London for the ten years from 1871 to 1880 was 33,168. If the death-rate of 1838-41 had been maintained during this period, the number of deaths would have been only 7,868. In other words, 25,300 lives appear to have been lost in London in 1871-80 from one class of disease alone, chiefly through mistaken "sanitation."

It follows from these premises that so-called sanitary fittings and plumbing are dangerous unless they are not only satisfactory in themselves, but are also connected with drains and sewers which are equally well designed and constructed. Everything must be so arranged that pollution of air, soil, and water-supply is reduced to the smallest possible amount. It is false economy to cut down the cost of sanitary work below a certain limit. Sanitary fittings ought always to be of good quality and properly fitted. If little money can be afforded, the number of the fittings must be reduced, as it is better to have one good water-closet than (say) two bad water-closets, or a bad water-closet and a bad slop-closet. Economy can also be effected by grouping the sanitary fittings together, and so reducing the length of the drains and the number of ventilating pipes, but this branch of the subject will be more fully discussed in the next article.

A MEMORIAL TO THE LATE SIR RICHARD TATE.—It is stated that Lady Tate, widow of the late Sir Richard Tate, Bart., has undertaken to defray the cost of erecting a new chancel at the Independent Church, Brighton, as a memorial to the donor of the National Gallery of British Art at Millbank. The church is being enlarged after the designs of Mr. P. Morley Horder.

OBITUARY.

DR. W. POLE, F.R.S.—On Sunday last Dr. William Pole, F.R.S., F.R.S.E., Hon.M.Inst.C.E., Mus. Doc., died at 9, Stanhope-place, Hyde Park, W., at the age of eighty-six. Although comparatively little known to the rising generation, the name of Dr. Pole is familiar to those who have left youth behind them as that of an accomplished and versatile genius, who was one of the ornaments of the century which has recently drawn to a close. Born on April 22, 1814, in Birmingham, he was articled to Mr. C. Clapper, an engineer in that city. On the expiration of his time he was concerned for three years in the construction of gasworks plant, and for four years in the warming and ventilation of buildings under the late Mr. Sylvester, who may be remembered as the inventor of the hot-air stove which bears his name. In the year 1836 he was elected an Associate of the Institution of Civil Engineers, for at that time the class of Associate Members did not exist, and four years later he received from the Hon. East India Company the appointment of Professor of Civil Engineering in Elphinstone College, Bombay. Returning to England in 1847, he was chiefly occupied in the mechanical branch of his profession, holding responsible positions as the Agent, Commissioner, and M. Simpson and Mr. Randall, and taking an active part in the provision of plant and stock for Indian Railway undertakings. On February 12, 1856, he was proposed by the late Mr. John S. Rastrick, and elected a member of the Institution of Civil Engineers; and in 1859 he became Professor of Civil Engineering at University College, London—a position he held until the year 1867. During the same period he also acted as Lecturer at the Royal Engineers Establishment. These appointments no doubt served as stepping stones to still more important scientific work on behalf of her Majesty's Government, for which Dr. Pole was eminently qualified both by his practical experience and by his intellectual attainments. From 1861 to 1864 he was a member of the Committee on Armour Plates; from 1863 to 1865 he served as one of the Committee on the comparative merits of Whitworth and Armstrong guns. He next acted as secretary to different Government Commissions; from 1865-1867 to the Royal Commission of Railways; from 1867-1869 to the Royal Commission on Water Supply; from 1882-1884 to the Royal Commission on the Pollution of the Thames; and in 1885 to a Committee on the South Kensington Museums. In connexion with the work following the recommendations of the Water Commission, he took an active part, especially with regard to the constant service system. In 1870 he was appointed by the Board of Trade one of the Gas Referees for the Metropolis, and in this position he held until the year 1890. At the request of the Institution of Civil Engineers, Dr. Pole undertook the work of arranging a mass of information gathered with relation to the systems of engineering education adopted by different countries. The result was an octavo volume, published in 1870, and bearing the title, "The Status of Civil Engineers in the United Kingdom and Foreign Countries." He was elected a member of the Council of the Institution in 1871, and in the same year his services were engaged by the Japanese Government, for which he acted as consulting engineer to the Imperial railway system, receiving on his retirement in 1883 the Imperial Order of the Rising Sun. He was elected honorary secretary to the Institution of Civil Engineers in 1885, as the successor to Mr. Charles Manby, F.G.S., and on giving up this office in 1896 he was proposed by Mr. (now Sir) John Wolfe Barry, and elected an honorary member of the Institution. Besides contributing various papers to the Institution of Civil Engineers, Dr. Pole was the author of many works on scientific subjects. Amongst others may be mentioned, "A Treatise on the Cornish Pumping Engine," 1844; "Iron as a Material of Construction," 1872; "The Life of Sir William Fairbairn," 1877; "The Life of Sir William Siemens," 1888. He was elected a Fellow of the Royal Society in June, 1891, and held office as Vice-President of the Institution in 1892. As may be supposed from his doctor's degree, he was a learned and accomplished musician and musical critic, though he did not produce much as a musical composer. Dr. Pole was also an authority on whist, of world-wide acceptance; indeed, we have met people who knew him only as a celebrated whist player, without being aware of his other and more serious accomplishments. Dr. Pole had also a special knowledge of precious stones, and contributed a learned article on the subject to a well-known review some time since. That one man should have been acquainted with so many different subjects, not superficially but thoroughly and scientifically, shows the possession of mental powers of a very unusual order.

Mr. H. C. BOYES.—We regret to announce the death on December 26, at Fir Cottage, Weybridge, in his fifty-fifth year, of Mr. Henry Cowell Boyes, of No. 6, Grocers' Hall-court, and Ormond House, Great Trinity-lane, Queen Victoria-street, E.C. Mr. Boyes was elected an Associate of the Royal Institute of British Architects in 1874, and a Fellow in 1882. He was a past-President of the Electrical Association, of which he had been elected a

member in 1865, and in 1888 was elected a Fellow of the Surveyors' Institution. He took a warm interest in all matters relating to the auxiliary forces of the Crown, and as Lieutenant-Colonel of the London Rifle Brigade was recipient of the Volunteer Decoration medal. Mr. Boyes was architect and surveyor to the Grocers' Company. In that capacity he superintended the reconstruction (by Messrs. Cubitt & Co.) and decoration of that company's hall, of which we published a view of the interior on July 15, 1893, together with new reception-rooms and some other apartments on the garden ground. The hall, which now measures 96 ft. by 42 ft., had been rebuilt in 1798-1802 by Thomas Leverton, and was altered in 1828 by Joseph Gwilt, who built the front towards Princes-street, and rebuilt the clerk's official residence. Mr. Boyes also carried out some extensive alterations and improvements of the buildings of the company's grammar school at Oundle, Northamptonshire, founded in 1556. Of other architectural works by him which have been illustrated in our columns we may mention the house, Ridgemoat, at Enfield Green, near Egham, for Mr. A. de M. Mocatta (April 10, 1886*); premises for Messrs. Secley & Co. in Essex-street, Strand, W.C. (May 10, 1885); and, in or about 1895, the rebuilding of No. 49, Chancery-lane, W.C. (December 30, 1895). Mr. Boyes also made the plans and drawings for a school erected in 1891-2, at a total cost of upwards of 25,000l., by Messrs. Cubitt & Co. upon the site of Dimsdale, Fowler, & Co.'s former premises, No. 50, Cornhill for the banking firm of Messrs. Prescott, Dimsdale, Tugwell, Cave, & Co., and, in 1892, the premises in Great Trinity-lane, E.C., for Mr. W. H. Gray. Mr. Boyes was known to many men outside the profession in connexion with a small debating society called the "Casual Club," of which he was for many years Hon. Secretary, and in which he took great interest. Mr. Boyes was, from his genial and open character and manners, a general favourite with all who knew him. He was emphatically a man with many friends, all of whom will regret his comparatively early death.

Mr. E. M. WIMPERIS.—The death of Mr. E. M. Wimperis, Vice-President of the Institute of Painters in Water-colours, which took place on Christmas-day at the age of sixty-five, is a serious loss to English art. Almost self-taught as a water-colour artist, he was one of the finest and most powerful modern painters of the school of David Cox—the grand old water-colour school of broad treatment in the method best suited to the finest capabilities of the art. His landscapes, always among the best things in any exhibition in which they were found, had a certain sameness in subject; a wide reach and a great expanse of sky were subjects he never tired of; and yet they could not be called repetitions, nor could he be accused of mannerism; each work had its own individuality. He subsequently carried the same style into larger landscapes in oil, in which he was equally successful and powerful, though the style perhaps rather suggested a copy of a water-colour in oil. He was a true artist, whose works will be much missed on the walls of future exhibitions. We hope the Institute of Water-colours will give a collective representation of them.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, EASTBOURNE.—The foundation-stone of the new Roman Catholic Church at Eastbourne was laid on the 11th ult. The building is being erected at the corner of Grange-road and the Meads-road opposite the Town Hall. The plan comprises a wide nave with narrow aisles, chancel, side chapels, and sacristies, with a tower and small spire at the corner of the junction of the two thoroughfares. The length of the completed church will be 102 ft. and the width 53 ft. 6 in. The walls externally will be faced with Sussex sandstone, with windows, doorways, and all dressings of Bath stone. The roofs will be covered with red tiles and the spirelet with copper. In the interior the columns and all stonework will be of Corsham stone. The main entrance will face Grange-road, and will have a boldly-moulded archway in the form of a projecting porch covering the doors, and above the archway a niche with canopy will rise to the apex of the porch gable. Above the porch will be a four-light tracery window. The side facing Meads-road will contain five windows and a side porch. Buttresses will divide the wall of the aisle into five bays. A feature of the church will be the absence of a clearstory to the nave, and consequently the aisles will be unusually lofty. A sanctus bell-cot in stone will rise over the chancel arch, and externally mark the separation of the nave and sanctuary. A small baptistry will project from the end of the nave aisle. The tower will rise square to almost the height of the apex of the nave roof, after which it will be carried up in an octagonal form, with brackets at the angles; the upper story or belfry will have two light tracery windows with louvres on four sides. Internally, the nave will be divided into five bays, and will be separated from the aisles by four arches of wide span, supported by clustered columns with

moulded caps and bases. A gallery over the main entrance will project into the church the space of the first bay, and form part of the structure, being supported by stone columns and arches. The Chapel of Our Lady will be parallel to two bays of the south aisle, and will be divided from it by open arches. The chancel will be separated from the nave by an arch rising to the full height of the ceiling, and will be divided into two bays, having a groined roof in wood, supported by clustered wood shafts. There will be a five-light tracery window high up over the altar, and four two-light tracery windows in the clearstory. On the south side a stone tracery screen will open into a small choir gallery over part of the sacristy. The sacristies will be on the south side of the chancel, and beneath the working Sacristy there will be the heating chamber, from which the church will be warmed with hot air. The organ will be blown by hydraulic power; and a chamber to accommodate the engine and also the bellows will be formed at the end of the nave. Accommodation will be provided for about six hundred persons, and the cost of the structure when completed will be about 11,000l. The architect is Mr. Frederick A. Walters, F.S.A., Westminster, and the contractor is Councillor Mark Martin, of Eastbourne.

INFECTIOUS DISEASES HOSPITAL, FORT WILLIAM, IVERNNESS STRZE.—A new hospital for infectious diseases is to be erected at Fort William on the site of the former hospital, which was recently destroyed by fire. Messrs. L. & J. Falconer have been appointed architects.

BUILDING IN ARBOATH.—Employment in the building trades has been steady during the past twelve months. Few big jobs were undertaken, but large additions have been made to house-property in almost all parts of the town.

THE BUILDING TRADES, BELFAST.—The trade is in a considerably less prosperous condition than it was a year ago. Several causes have contributed to this regrettable state of affairs; but undoubtedly the principle one is the carpenters' strike, which was begun about eight months since, and still continues. Some hopes, however, are entertained that a settlement will have been come to before the new year is far advanced, as the men seem anxious for the master builders to make fresh proposals, and if this happens the result may be looked forward to as encouraging. There have been no great changes in prices, but a slight reduction has taken place in regard to iron and steel girders, which are now used very largely in building operations. Few new works have been undertaken in the centre of the city since this time last year, and the most of those which were then in progress and not of a public character have been seriously delayed in completion by the carpenters' strike. The building of the new City Hall is being pushed forward as rapidly as the magnitude of the structure and all the details that have to be taken into account will permit. The walls of the edifice can now be seen above the hoardings. Satisfactory progress is also being made with the erection of the Belfast Cathedral, which occupies the site of the old Church of St. Anne's in Donegal-street. The Bank buildings, put in the hands of contractors at the close of 1899, have been greatly altered and improved. Additions have been made to several factories to cope with increasing trade, but none of the developments made in this direction could be classified as important. A new bonded warehouse of extensive dimensions is being erected in Academy-street for the Irish Distillery, Limited; a new warehouse for Messrs. McCrum, Watson, & Mercer in Linen-hall-street; and a new warehouse for Messrs. Murphy & Stevenson in the same street; while similar buildings are being constructed for Mr. John Thompson, Victoria factory, on the Dublin-road, and for Mr. J. Lepper in Donegal-street, in ecclesiastical architecture a good deal of business has been done. Several new churches have been established, especially in the outlying districts of the city, while many of the older edifices have undergone more or less extensive renovation. A hopeful start has been made with the building of the Royal Victoria Hospital, which, when completed, will cost close upon 100,000l. The position of the trade is certainly rather dull at present; but the outlook in prospect of an immediate settlement of the dispute between the masters and carpenters is more cheerful.—*Belfast News Letter.*

STONE AND BUILDING TRADES, BRADFORD.—The great activity which marked these local trades in the early part of the year 1900 seems to have declined gradually down to comparative quietness. Whether the extension of the city boundaries and the additional tramway facilities will bring about a partial revival remains to be seen. Some of the principal contracts let during the year and now in progress are those in connexion with the Cartwright Memorial Hall, the new Fire Brigade Station, the new Conditioning House, the extension of the Electricity Works, the large tramcar shed at Thornbury, the Green-lane Board Schools, the extension of the Bradford Provident Industrial Society's premises in Sunbridge-road, and alterations at the Old Brewery premises in Brewery-street. Of projected new public buildings may be named the new Corporation baths in Morley-street and Drummond-road, district police offices and fire stations, and the extension of the Rawson Place Market, while the extension of the

* Out of print.

Town Hall is receiving increased consideration. The Lancashire and Yorkshire Railway Company have let the contract for a large warehouse in Bridge-street, to cost about 60,000. House building has gone on at a rapid rate in many parts of the city, especially in the districts of Horton Grange-road, Lidget Green, Bradford Moor, and Eccleshill. There is a lull now, however, in this class of building. The local stone trade, though brisk during the first half of 1900, has fallen off considerably during the latter half, but the London trade has been fairly good during the year, and continues so. The following are about the prices which have ruled during the past twelve months, the figures vary somewhat according to quality:—Self-faced flags, 2 in. thick, 23.4d. to 25.6d. per superficial yard; 2½ in., 25. 10d. to 28. 2d.; and 3 in., 35. 6d. to 38. 10d. Tooled flags, 2 in. thick, 35. 6d. to 35. 9d. per superficial yard; 2½ in., 45. 6d. to 45. 9d.; and 3 in., 45. 8d. to 45. 10d. Ashlar, 15. 8d. to 25. 2d. per cubic foot. Outside wall stones, 44s. to 54s. per rod; inside ditto, 22s. to 24s.; and pitch faced, 44s. to 50s. Common bricks, 25s. to 30s. per thousand at works. There has been a steady demand during the year for timber, and prices have been well maintained.—*Bradford Observer*.

BUILDING IN BRISTOL.—A considerable amount of building work has been done in the year. Right in the middle of the St. Augustine's site, which had been recommended for municipal buildings, but which the members of the Council could not make up their minds to secure for that purpose, a fine block has been under construction since January for the Star Insurance Company. The Eagle Insurance Company has found a new home in Baldwin-street. At the corner of Clare-street and St. Stephen's-avenue workmen have been busy on a new office for the Prudential Company, and the purchase by the Sun Company, a few days ago, of the site of Mr. Thornley's business premises at the corner of Clare-street and the Broad Quay seems to suggest still another insurance office in that locality. The site in the last case cost the buyers 20,000. On a site between the Narrow Quay and Prince-street, the preliminaries have been practically completed for the erection of a large building by the Wholesale Co-operative Association. The amount to be spent on this structure has been spoken of as 40,000. Messrs. W. D. & H. O. Wills have opened, on the field which used to be in old days the Bedminster Cricket Ground, an immense factory to accommodate their industry, and Messrs. J. S. Fry & Sons have had in hand for many months past schemes for still further enlarging their works. Operations have been going on on two sites—one in Union-street and the other in the Fitzroy. The tramway power-house at Counterslip, their new depots, the Council House annex, the new public library in Cheltenham-road, Horfield Baptist Chapel, St. James's Parish Hall, All Hallows' Church, Easton, the extension of the Shaftesbury Hall, the new Y.M.C.A. at Totterdown, a new place of worship for the Bristol Society of the New Church, Cranbrook-road, the new church of St. Martin, Upper Knowle, the Franciscan Church at Bishopston, several new board schools, and the new wing of the Bristol University College are among the schemes which have occupied the builders, who have had also no small amount of business in converting private houses into shops and in the development of building estates. The fire which destroyed the former Colston Hall enabled fittings to be removed in the new design, and the existing accommodation to be greatly increased. The new hall seats about 4,000 persons. At Bath there has been the opening of the Art Gallery; at Weston, the building of a new Wesleyan church and of a museum and library.—*Western Press*.

BUILDING IN DUNDEE.—A survey of the building trade in Dundee reveals the fact that much activity has prevailed in every branch of the industry during the past two seasons of exceptional business. This state of matters is highly satisfactory, and together the past three years will rank as about the best business period experienced by the Dundee building trade for a very long time. The work performed last year has been especially marked in the direction of tenement and villa residence building, and the districts of the town have been for the most part the east and north ends of the city, although, consequent on the opening up to the fear of Blackness estate, operations in the west end have been greater than for several years back. It is a pleasing commentary, too, on the extension of the city's tramway system, that many of the new buildings have been erected, or are in the course of erection, along those routes tapped by the new lines or in the vicinity of their termini. This has been more pronounced in the Maryfield and Strathmartine suburbs, and by the time the cars are running to Ninevels a large addition to house property will have been made at this, the extreme West end of Dundee's boundaries. In 1899, and indeed for a considerable time previously, there was an outcry that the city was being overbuilt with tenement houses. This agitation seemed in no way to deter builders from continuing the campaign, but now matters appear to have reached high water level, and on all hands it is admitted that the putting down of new house property of the tenement class will practically have to be stopped for the best of all possible reasons—scarcity of

tenants. A very great deal of money was sunk last year in villa building, and the demand here is still sufficient to encourage further outlay on the part of those with cash to spare for investment. Amongst the building work of 1899 has to be included several large Corporation and private contracts carried out in the centre of the city, and some of these have been of an important character—notably the new municipal fire-station and the Parish Council offices. Church building has again formed a feature of the year's work.—*Dundee Advertiser*.

BUILDING IN LEITH, EDINBURGH.—A report issued by the Burgh Surveyor for Leith shows that during the year eighty-four applications for warrant to build were reported on at the Dean of Guild Court, compared with ninety-one the previous year. Several of the largest of the buildings which were for speculative purposes, including blocks of tenement houses, have, however, never been prosecuted further. On the whole, the year has been a quiet one compared with 1899, which was marked by exceptional activity. In the latter part of the year especially, the erection of new buildings apparently received a check, and the masons' strike, occurring as it did when a lull in the trade had taken place, most likely deterred many building operations until the spring of the next year. The erection of villas in the Trinity district has continued, but on a much more moderate scale; and in South Leith several large blocks of dwelling-houses have been constructed. Amongst the principal new buildings completed during the year were a church, an addition to the hospital, and a series of bonded stores. Work in the Dean of Guild Court during the last two or three months has diminished very much; and the absence of plans for any large buildings before the Court shows that there is a prospect of quietness in the building trade during the winter especially.—*Scotsman*.

BUILDING IN HALIFAX.—The building trade, in comparison with previous years, has been quiet. Several large contracts which have afforded ample employment for several years for masons and joiners have practically been completed, including the large Workhouse Hospital and the new Victoria Hall. A good many men are now unemployed, and those who are at work are mainly engaged on the erection of houses and cottages.

BUILDING IN HUDERSFIELD.—The building trades have been in a fairly flourishing condition throughout the year, but few works of much extent are at present in prospect for the coming year. The new Drill Hall is nearly finished, the new Temperance Hall is being roofed, and the new Church of St. Barnabas at Crosland Moor is well advanced, the generating station at Longroyd Bridge for the Corporation electric tramways is now nearly completed, and very soon the works of the Batterley reservoir of the Corporation Waterworks in the Wessenden Valley, Marsden, which have already cost 271,665l., will be finished. Up to November plans had been approved by the Corporation of 273 dwelling-houses (against 259 in the year preceding), 60 business premises, and 195 miscellaneous buildings. The chief work of the new year is the erection of the lunatic asylum at Storches Hall, near Kirkburton, and the extension by the Co-operative Society of their premises over the site of the present Victoria Temperance Hall in Buxton-road.

BUILDING IN HULL.—Building in the city has been exceptionally brisk during the past year. Many large buildings have been undertaken, and a great deal of house property erected, particularly on the outskirts of the city. This has been owing to the service of trams which has been in operation for the past eighteen months. A large area has been cleared of slum property, and blocks of artisans' dwellings are being put up by the Corporation. The year has been free from serious labour disputes affecting builders, consequently good progress was made in the erection of many buildings. Among these are the offices of the Yorkshire Provincial Bank in Saville-street, the National and Provincial Bank, Scale-lane-corner; the Ocean Accident Insurance Corporation, in Low-gate; the Telephone Exchange, in Mytongate; the Constitutional Club in Carr-lane, the extension of the Hull Savings Bank in George-street, the Pacific Club in High-street, and the Crematorium. Several new public schools have been erected, and the foundations of one large Board school have been laid. The outlook is said to be very bright.

THE BUILDING TRADE, INVERNESS.—For several years there has been a boom in the building trade in Inverness. Villa residences, business blocks, and dwelling blocks of all kinds were built with so much activity that the inevitable "slump" came, and for the last year or two there has been a feeling amongst monied people in the town that it is sufficiently built. The result now is that comparatively little building has been done during the past year, and that only what was necessary. Probably not in the memory of many contractors has there been such a lullness in trade. Fortunately there has been some stir in the country, and the workmen have been able to get employment elsewhere. Many of them have been working at the huge extensions to Skibo Castle, which are being carried out by Messrs. Ross & Macbeth, architects, Inverness. There have been a few big jobs going on in Inverness, although generally speaking trade was quiet. What will be

the largest block of buildings erected in Inverness for a quarter of a century is nearing completion in Queen's Gate. The masonry work is all but finished, and the street may now claim to be one of the finest in the town, from a building point of view. The block has a frontage of 231 ft. to Queen's Gate and 50 ft. to Church-street. The ground floor consists of eleven shops, while the first and second floors contain suites of offices, and on the top, dwelling-houses. The future of the block is a large hotel. The buildings will be up to date, lighted with electricity throughout, and the hotel will have hydraulic lifts, with a passenger and luggage service to all the floors. The erection of these buildings, it may be mentioned, was the cause of the demolition of one of the oldest houses in town. The total cost of the buildings is estimated at 25,000l. The work is being carried out under the direction of Mr. W. Caruthers, architect. Another building which has given some work, and which is in course of erection, is the Crown United Free Church. With spire, it will cost about 6,000l. The architect is Mr. J. R. Rhind.—*Aberdeen Journal*.

THE BUILDING TRADE IN LEEDS.—On the whole those in Leeds who are associated with the building trade are entitled to look back upon the year with more satisfaction than was the case last December. They have been, for the first time for some years, free from trade disputes, and that has been by no means an unimportant factor. It is true the Tyneside dispute has brought a disturbing element at the close of the year. There, the bricklayers struck work in May last for an advance of wages from 20d. to 11d. per hour, and that has done more to disturb the Masters' Federation, to which the Yorkshire masters are affiliated, have taken the matter up, would seem to be no strong disposition locally to push matters to an extreme by locking out the Leeds bricklayers in sympathy. Trade, therefore, has been very brisk during the year. In the last month or so there has been a hesitancy to let new contracts, the architects preferring to await a fall in prices. This fall, so far as certain classes of material are concerned, has already begun, but timber retains its abnormal price, and it is said that no substantial reduction will be made until the re-opening of the Baltic ports. Speculative builders have for some time past been kept from launching out on this account. Since March 25, 1900, which marks the beginning of the official year, 2,342 new houses have been erected and completed in Leeds. The approximate number of miscellaneous buildings erected and certified during the same period is 2,021, and it includes schools in Thornville-road, Woodside-road, and Broad-lane (Bramley), a woollen department and a refectory at the Yorkshire College, Emmanuel Institute (Woodhouse-lane), Constitutional Club (Roundly-road), infantic ward at the Beckett-street Workhouse, a mission church, three factories, one foundry, and one engineering works. Then there are several large buildings nearing completion. The improvement of Briggate continues, and with the completion of the fine line of new buildings at the top of the hill and of the new arcade, probably the finest in the north, the character of the street will be further changed. Lower down, the rebuilding of the Bull and Moutb estate is proceeding apace, and the new street from Duncan-street to Kirkgate, cutting through a "rookery," will be especially welcome. The Masonic Hall and the Leeds Pupil Teachers' Centre are also well forward. Looking ahead, there are such important schemes to be executed as the demolition of the Dispensary buildings, in order to complete the improvement of North-street, and the provision of a new home for the institution on Hartley Hill, and the pulling down of St. Ann's Cathedral for the improvement of Cookridge-street. This will cost the Corporation 40,000l., and another site for the Cathedral, and it is expected that the latter will be found in Great George-street. Several large contracts will shortly be let, and these will include a Market Hall, the Infectious Diseases Hospital at Manston, some churches and chapels, and several industrial establishments.—*Yorkshire Post*.

BUILDING IN MANCHESTER.—Builders and contractors in the Manchester district have experienced an unvarying briskness in trade throughout the year, but they have one important cause for regret. Many of them had large contracts in hand at the beginning of the year, and during the twelve months the prices of materials in all branches of the trade rose so rapidly that contractors in many instances sustained serious losses. Though this was very important, there are such important schemes to be executed, and no other reason to complain. Wages have maintained a high standard, and the workmen have enjoyed uninterrupted prosperity. Many large contracts have been in hand by Manchester and Salford firms, including the erection of the new station for the Lancashire and Yorkshire Railway Company at Bolton, which is to cost 300,000l.; the building of an additional 3,000,000l. worth of contracts, being also about 300,000l.; large undertakings for the London and North-Western Railway Company, the Great Northern Railway Company, and various large works in the neighbourhood of the Ship Canal. The prospects for the coming year are said to be satisfactory.

THE BUILDING TRADE, PERTH.—There is no distinguishing feature in last year's building operations. The end of 1899 saw a number of impor-

tant buildings in course of erection. Of these some are still in progress. Among those are the General Accident Assurance Company's office at the corner of High-street and Tay-street; the Royal Bank buildings at the corner of High-street and Kinross-street, which now almost complete the new street; the stable at Feus Wynd; and the Hospital for Consumptives at Barnhill. The principal buildings of last year include a coopers and store in Gray-street; the new Central District School in Meal Vennel; and laundry and gymnasium accommodation for the Caledonian-road School. A block of shops and dwelling-houses at the corner of South Methven-street and South-street will in the future improve that part of the town. A new mission hall for the United Free St. Stephen's Church and a new church for the United Free St. Paul's congregation are also being erected. A factory at Feus Wynd is on hand, and additions to dyeworks. Besides these, the Corporation are working at a scheme of working-class houses. Two blocks at Old High-street have been completed, and are now occupied, and two additions to these are in course of erection. This scheme is the realisation of a long-spoken-of and much-needed improvement—the widening of Old High-street. Seven large blocks of tenements have been in course of erection, chiefly in the northern district. During the year fourteen double villas have passed the Court, a large proportion of these being in the Craigie district. Many alterations and additions have been made to property in the town, and a large addition is to be made to Messrs. Pullar's dyeworks. Whatever the prospects for this year may be—and from the look of things in other towns it cannot be so good as recent years—this year has on the whole been marked with a fair amount of activity, but with master and workman working hand in hand, and in view of a reduction in the price of material, the prospect for the future may not be discouraging.—*Dundee Advertiser.*

HOME FOR CHILDREN, TUDHOE, DURHAM.—A home for children has just been opened at Tudhoe. The architects were Messrs. Dunn, Hanson, & Fenwick, of Newcastle, and Messrs. Johnson & Hanby, of Stockton-on-Tees, were the contractors.

BUILDING IN PETERHEAD.—The local building trade shows signs of great activity. Several new buildings have been completed in the course of the year, including the new Parish Home in King-street, a block of tenement houses in Kirk-street, a block of buildings at the corner of Windmill-street, &c. The building trades altogether have had a busy time, and the prospects are good for next year.

BUILDING IN ST. ANDREWS.—The building trades in the city have been busy throughout the year, and the prospects for the current year are fairly good. New ground has been opened up at the west end of the town within the area of the recently extended burgh boundary, and a number of smaller-sized villas are being erected. Properties are also expected to be built in other parts of the city in the course of the year.

BUILDING IN SHEFFIELD.—The operations of the builder are rapidly obliterating many of the beauties which the city once possessed. The city which was, a year or two ago, encircled with picturesque wooded hills, is now surrounded with a girle of brick-built cottages, the fiery colour of which is much too striking a complement to the soft green of the hills to be artistic. One can hardly look on the unpaved roads of many of the new streets and imagine that only a year or two ago nothing but meadows and trees existed there. In some places the smoke of the town has not yet had time completely to disappear from the green fields, and consequently there is a strange mixture of pastoral landscape and harshly-outlined streets. In another year or two, if the demand for cottage houses is maintained, the summits of the hills around the city will be reached by the builder, and the chief beauties of Sheffield's immediate surroundings will have been destroyed. The abnormal increase in building operations recorded in 1899 has been strongly maintained during the last twelve months. There has been a slight decrease in the number of houses erected during the year, but the falling off is more than accounted for by the special circumstances which existed in 1899. The approximate number of houses certified for occupation during the past year was 2,797, as against 2,616 the year before, i.e., an increase of houses certified of 181. During the year 1365 plans for all classes of buildings have been deposited, as against 1474 in 1899, a decrease of 109. In regard to street and sewage works thirty-two plans have been approved. These plans have involved or will entail the making of 5,051 yards of streets with sewers. There have also been sent in eighteen plans for sewers alone, and these will necessitate the making of 564 yards of sewers. The total extent of streets with sewers and sewers alone approved during the year thus amount to 5,615 yards, or over three miles. Coming to minor buildings, we find that ninety-two plans for such erections as cow-houses and stables have been approved during the year, as against ninety-nine last year. Plans for warehouses, workshops, &c., have numbered 654, as against 477 in 1899. The summary of statistics shows that the number of plans deposited for houses has fallen off by 1,200, and plans for other buildings have increased by something like 180; 070 of the plans which have

been deposited have been approved.—*Sheffield Independent.*

BUILDING IN YORK.—The erection of new buildings has been very brisk. Most of the houses have been erected on the new estates in Bishopthorpe-road, South Bank, Huntington-road, Leeman-road, Burton-lane, and Acomb-road. Two hundred and thirty-six plans have been submitted during the year, of which 170 have been passed, comprising 656 houses, 114 warehouses, out-buildings, &c., fifty-nine alterations and additions to premises, twelve new streets and back roads, and eleven public buildings, as follows: A church in Burton-lane, a Primitive Methodist chapel in Albany-street, a bicycle track and club-house Hull-road, two public-houses, three mission-rooms, and an arcade in High Ousegate.

THE PRINCE'S THEATRE, PRESTON.—This place of amusement, which has been in the hands of the builders for some fifteen weeks, has just been reopened. One of the most noticeable changes in the auditorium is the removal of the roof timbers and the wooden uprights which supported them, so that the occupants in all parts of the balconies are now enabled to have an uninterrupted view of the stage. Improvements have been effected in the ventilation, and appliances being provided by Messrs. James Slott & Co., engineers, of Manchester. The old boarded floor of the pit has been removed and replaced with Duff's patent wood block flooring laid on cement concrete by the Acme Wood Flooring Company, Limited, London. Additional emergency exits from the pit have been formed on each side of the stage. The staircases to the centre circle and balconies are of stone, enclosed with brick walls, and both the mezzanine floor and ceiling above it are of fireproof construction. The seating accommodation of this part of the house has been rearranged and improved, and the two approaches from the mezzanine floor to the circle are placed in direct communication with the staircases. The proscenium opening, 28 ft. wide and 23 ft. high, is fitted with an iron and asbestos fireproof curtain, supplied by Messrs. Merryweather & Sons, of London. The proscenium opening has been decorated in fibrous plaster by Messrs. Goodall & Co., of Liverpool, who also executed the balcony front. The stage has been improved by the provision of fly floors 33 ft. apart, scene artist's painting bridge, and a large grid, 50 ft. above the stage. The stage is also considerably enlarged, being 63 ft. wide and 40 ft. deep, giving an area of 2,520 square feet. Eight additional dressing-rooms, with necessary conveniences, have been provided at the back of the stage, from which they are cut off by iron doors as a corridor, the private entrances for the artistes being in Fochle-street and Tithenham-street. The contract for the whole of the work was let to Messrs. Whiteside, builders, of Preston, and the sub-contractors were Messrs. T. Croft & Sons, brickwork and masonry; Mr. W. Dryden, ironfounder's work; Mr. Thomas Nickson, slating; Messrs. Foster & Son, Padiham, plasterer's work; Mr. Edge, gas-fitting and stage lighting; and Messrs. Park & Son, plumber and painter's work. The alterations have been carried out under the superintendence of, and according to plans prepared by, Mr. W. Munford, architect, of Preston.

EUSTON THEATRE OF VARIETIES.—On the 19th ult. the Euston, which is situated just opposite the Midland terminus in Euston-road, was opened. There is accommodation for about 3,000 people. The house has been built from the designs of Messrs. Wyson & Long.

VICTORIA THEATRE, BROUGHTON, MANCHESTER.—This theatre, which has been erected near the junction of Fochle-street and Lower Broughton-road, has just been opened. The front of the building is of terra-cotta. On the ground floor are three shops, the main entrance, and the pit entrance. The front is divided by pilasters into bays, the centre one being surrounded by a carved pediment, above which is an attic story with a copper dome and iron cresting. From the main entrance the vestibule is entered; this is 24 ft. long by 16 ft. wide, with mosaic flooring and marble dado. To the left is the p-box to all parts of the house, and to the right a stair to the balcony. Facing the entrance from the street the vestibule opens direct into the grand foyer, 34 ft. by 18 ft., with mosaic flooring, walls panelled in fibrous plaster, and painted ceiling. From the foyer runs a corridor leading direct to the stalls, dress circle, and grand saloon. The auditorium is planned upon the composite two-tier principle, having orchestra stalls, pit stalls, and pit on the ground tier, dress circle and balcony above. Higher up the gallery, and on each side of the stage front, are two boxes. Seats are provided for 2,000 persons, but the holding capacity of the theatre is estimated at 2,500. The grand saloon for the dress circle and balcony is 42 ft. long and 25 ft. wide, and the orchestra stalls have their own saloon on the same floor. The lighting of the theatre is at present by gas, but electric light fittings have been installed in view of future requirements. The stage is 40 ft. from the curtain line to the back wall, 75 ft. in width, and nearly 60 ft. from the stage to the grid. The proscenium opening is 32 ft. in width. Abutting the stage are eighteen dressing-rooms as well as property-rooms. Mr. Bertie Crewe, of London, was the architect, Messrs. William Brown & Sons, of Salford, having

been the principal contractors. The cost has been nearly 25,000.

PUBLIC BATHS, LEYTONSTONE.—The foundation stone was laid recently of the public baths which are in course of erection in Cathall-road, Leytonstone. There will be a first-class swimming bath 100 ft. long by 30 ft. wide, the depth varying from 6 ft. 6 in. to 3 ft. 6 in., a second-class bath, 80 ft. by 30 ft., and a number of slipper baths. Mr. W. H. Duffield is the architect, and Mr. F. J. Coxhead, the builder.

THE CAMDEN THEATRE, CAMDEN TOWN.—The latest addition to the list of district playhouses is the Camden Theatre, situated at the southern end of High-street, Camden-town. The architect is Mr. W. G. R. Sprague, while Messrs. Waring have carried out the decorations. The theatre is built of stone, and over the main entrance there has been constructed a promenade and winter garden. The interior is partly on the cantilever system. The building, which gives accommodation to an audience of over three thousand, has cost 50,000. The stage is 40 ft. deep by 75 ft. wide, with a height of 60 ft. to the grid, and electric light is the only illuminating agent. The ceiling is supported by a cove.

NEW ASYLUM NEAR ABERDEEN.—The offer of Mr. Edgar Gauld, builder, Aberdeen, to execute the mason work of new asylum at Newmachar has been accepted by Aberdeen City Parish Council. The operations will be kept on until about 30,000. The operations will be commenced at once. Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, is architect. The other works will be contracted for by-and-by; but the mason work is to be commenced at once.

THE PRESERVATION OF ROCHESTER CASTLE.—The repairs to the keep of Rochester Castle, arranged to be executed during the year 1900, are now completed. The work has been carried out under the supervision of Mr. George Payne, architect. Half as far down as the floor level of the state chamber, has been restored, and certain areas which were structurally unsafe have been made good. A gallery along the same side was in a very ruinous state, especially where the great crack occurred after the rebuilding of the south-east angle in the thirteenth century. In his report to the Rochester Corporation, Mr. Payne states that a large amount of the damage everywhere present in this gallery was due, as in all accessible parts of the keep, to the wanton destruction of arches and jambs in past times for the sake of the squared stones they contained. As these supports had been removed, it was deemed necessary for the stability of the fabric to replace them with Kentish rag. One outcome of the repair of the eastern wall of the keep has been to bring several interesting architectural features to light, and these are now permanently exposed to view. The beautiful arcade dividing the state chamber has been successfully treated. Traces were discovered, whilst the central wall was being repaired, that the keep had at some period suffered from fire. The cleaning out of the well of the keep proved to be a laborious work. The total depth from the top of the central wall of the keep to the bottom of the well was found to be 136 ft., and the diameter of the well-shaft from 2 ft. 9 in. to 4 ft. At low tide the water in the well has a depth of 18 in., but at high tide it reaches 9 ft.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, LIVERPOOL.—The ceremony of cutting the first sod of a new reservoir at Prescott, in connexion with the water supply of Liverpool, took place on the 22nd ult. Mr. J. PARRY is the water engineer to the Liverpool Corporation. The work will be carried out by Messrs. Holme & King.

WATER SUPPLY, SCONE, PERTHSHIRE.—The water supply for the village of Scone was turned on on the 26th ult. Mr. W. R. Copland was the engineer.

FOREIGN.

FRANCE.—The Committee of the Société des Artistes Français (Old Salon), as the result of a somewhat heated discussion, has resigned its body, and a new committee is to be elected.—The Académie des Beaux-Arts has elected M. Camille Saint-Saëns President, and M. J. P. Laurens Vice-President.—The Conseil-Général of the Seine has petitioned the Government for the formation of a School of Arts and Industries in the Department.—The new buildings of the Bibliothèque Nationale, fronting on Rue Colbert and Rue Vivienne, are nearly completed.

The new buildings for the Académie de Médecine, in the Rue Buonaparte, will be opened next month.—An International Exhibition is to be held at Brest, to open in the middle of June.—The Municipality of Paris has acquired the mural paintings which decorated the staircase of the old Hôtel de Luynes, now in course of demolition. These works, executed in 1748 by Brunetti, show a number of personages in Watteau costumes seated on a balustrade intercepted by Corinthian columns; a garden scene forms the background. The three frescos, which are in very good preservation, will be seen from the wall and reflected most probably, in the Petit Palais.—M. Camille Lefèvre,

the sculptor, is completing for the Mairie of Issy-les-Moulineux a fine relief representing the Republics of 1792, 1830, and 1848 offering palms to M. Paul Lenard, sculptor, and a statue of the Duke of Orleans erected in the Allée de la Liberté at Cannes. He died at Cannes, at a villa which he shared with M. Gérôme.

CANADA.—Owing to the number of accidents which have occurred, a committee of the City Council of Toronto have under consideration the subject of the inspection of elevators by the municipality. The estimated number of elevators in that city is placed at 1,000.—The authorities of Queen's University, Kingston, have issued an invitation to architects to submit plans and designs for new buildings, to cost about 150,000 dols. A professional assessor not having been appointed to adjudicate on the plans, the Ontario Association of Architects has approached the authorities in reference to this omission.—Official statistics relating to the yield of minerals in the Province of Quebec in 1899 show that during the year the following building materials were raised or made:—Bricks, valued at 600,000 dols.; building stone, 250,000 dols.; lime, 110,000 dols.; cement, 31,130 dols.; granite, 14,780 dols.; flagstones, 3,500 dols.; and slate, 30,110 dols.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.

—Mr. Edward Chesterton, a member of the firm of Chesterton & Sons, auctioneers, for upwards of thirty-five years, has retired as from December 31. The business will be continued, under the style of Chesterton & Sons, by the remaining partners, Mr. Sidney R. Chesterton, Mr. C. F. Slater, and Mr. W. H. Wells, who have taken into partnership Mr. Frank S. Chesterton.—Messrs. Hayward Bros. & Eckstein, engineers and ironfounders, of Union-street, Borough, have opened a branch office and showrooms at 63, Mosley-street, Manchester.—Mr. Leopold Farmer, auctioneer and surveyor, of 46, Gresham-street, has taken into partnership his two sons, Mr. Harold L. Farmer and Mr. Herbert L. Farmer; and the firm will in future be known as "Leopold Farmer & Sons."

EDINBURGH AND LEITH MASTER BUILDERS' ASSOCIATION.—The annual dinner in connection with this organisation was held on the 20th ult. in the Royal British Hotel. Mr. James Millar, the President, was in the chair, and the croupiers were Messrs. Purves and Messrs. Drysdale and Lownie. Included in a company of about 130 were representatives of the Town Councils of the city and Leith, the Architectural Association, the Architectural Society, and the Society of Ordained Surveyors, the Glasgow Master Masons' Association and Master Builders' Association, the Dundee and District Master Builders' Association, the Perth and District Federation, the Dumfries Builders' Association, the Aberdeen Federation, and the local House Factors' Association. The Chairman gave "The Queen and Royal Family," and Mr. Ormiston "The Navy, Army, and Reserve Forces," for which ex-Battle M.L.E.S.H., Perth, responded. In submitting the toast, "The Lord Provost, Magistrates, and Town Councils of Edinburgh and Leith," the Chairman gave it as his opinion that if the housing of the poor was to be thoroughly gone into it would not be successfully accomplished by private speculation. At present the building trades were suffering from a slight depression, but he did not expect they would suffer much or very long. Battle Murray and Baillie Craig replied.

Mr. T. A. Williamson, a member of the Council of the Edinburgh Architectural Association, proposed the toast of the evening—"The Association." In doing so, he said that they all regretted the signs of a slightly falling trade, but hoped it might prove but temporary. The record of the city's growth was somewhat phenomenal. Since the passing of the Valuation Act in 1855 there had been a steady increase in the rental of the city, and of late years the ratio of increase had been very marked. Therefore, they all trusted that things would take a turn, and speedily revert to the older and more satisfactory conditions, in which the trades represented there were so deeply interested. For the sake of the workers they all desired an active and healthy state of trade, and personally he did not think the outlook was so serious as was sometimes suggested. In conclusion, Mr. Williamson congratulated the Association on the fact that a distinguished representative of the building trade had been selected for the highest place in the municipality.—Mr. Bruce, in responding, spoke of the importance of the building industry, and said that without it amongst the citizens would not be so comfortable as they were to-day. The Association existed for good—for the prosperity of the different branches of the trade. No doubt they had their difficulties at times. Reference had been made to the masons' strike, throughout which prolonged period the unity of the organisation was maintained. But for that the organisation would have failed. With it unity the employers would have failed. But for that they succeeded, and they succeeded because of the stupidity, he was sorry to say, of the operatives. They condemned themselves by the proposition they submitted to the employers. What was wanted was that employers and employed should work

together in harmony, because what was for the interest of the one class was for the interest of the other. In connection with the strike, he did not think the leaders of the men were in doing the activities they did. The present arrangements, he thought, were neither sound nor correct. There ought to be a minimum rate of wages, but no maximum, and the period during which any agreement should last should be reduced from a year to six months; while there ought to be legislative enactment whereby strikes should be illegal, and there should be a Council of Arbitration established in the country for the settlement of disputes. Treasurer Graham Yooll gave "The Scottish Building Trades Federation," and among the other toasts were "The Architects and Surveyors," "Our Merchants and Contractors," "The Chairman and Croupiers."

GLASGOW ARCHAEOLOGICAL SOCIETY.—The monthly meeting of the Glasgow Archaeological Society was held on the 20th ult. Mr. C. White-law said, in view of the discussion which had taken place about the placing of monuments in Westminster Abbey, that the members of the Glasgow Archaeological Society ought to pay attention to their own cathedral, where several large, costly, and very conspicuous monuments had been placed in the nave. Several of them were established in a manner which it was impossible for the hand of Time to tone to a colour suitable to their surroundings—most of them were made of white marble. The persons to whom they had been raised were at present important, but whether they would be important to another generation was an open question. He thought it necessary for the preservation of the appearance of the cathedral that no more monuments should be erected there, especially as they were being placed to perpetuate the memory of men who were not celebrated, but were merely known at the time for having had larger purses than their fellow-citizens. Men whose memory was celebrated by a monument in the cathedral should be of great outstanding merit, men renowned in the affairs of the nation and also of the city. The Society ought to consider the matter now, before any serious harm was done. Many of the monuments were in questionable taste, and if no more were erected it would be an advantage to the cathedral.—Mr. John Edwards thought the matter was one which ought to be very carefully considered before any more monuments of modern type were erected. Mr. J. D. Duncan said that when he was recently in the cathedral he was struck by the inappropriateness of many of the monuments in the nave. He thought it would be desirable to ask the Board of Works to see that great caution was used in the granting of facilities or permissions to erect monuments in the cathedral. The matter was remitted to the Council, to which Mr. White-law was added for the occasion. Mr. George Neilson, Vice-President, read a paper on "The Work and Place of Huchown."

NEW ELECTRICITY STATION, ABERDEEN.—The Gas and Electric Lighting Committee recommend that a portion of the new electric station at Dee Village be gone on with, including offices, half of boiler-house, half of engine and dynamo house, and a number of minor works, at a total cost of about 25,000. The machinery will cost, say, 20,000. additional. The plans are by Mr. Bell, Electrical Engineer to the Corporation, and Mr. Smith, Corporation Gas Manager.

BRITISH FIRE PREVENTION COMMITTEE.—Pending the opening of its new testing station, the British Fire Prevention Committee will conduct tests undertaken in the past year with the Mural and Decorations Company's floor, the "Cunhawn-Wright" partition, the Williams' firebrind, with two iron doors, and two pairs of wood doors. Summaries regarding tests undertaken at the North Bank Testing Station are also in preparation. Regarding the Committee's new testing station at Westbourne Park, a sub-committee of the executive will have charge of the arrangements, Mr. Ellis Marsland presiding.

ELECTRIC LIGHTING WORKS, STOCKTON.—For public lighting purposes at Stockton, the electric current was turned on on the 18th ult. at the Corporation's new electricity works. The system of supply is the "three-wire continuous current" system, with 460 volts being the output of the dynamos, the standard pressure of supply to the consumers being 260 volts. The generating machinery now installed consists of three "Universal" engines coupled to the Brush Company's standard type of continuous current generators. The dynamos are controlled by automatic switches and also by fuses, which will prevent damage being done by an excessive current. Up to the present the cables are laid in Thompson-street, High-street, Norton-road, Bishop-ton-lane, Dovecot-street, Yarm-lane, Wellington-street, and Silver-street. Contracts have also been let for extending the cables to Yarm-road, Oxbridge-lane, Richmond-road, and Church-row. Altogether there are three miles of distributor and one and a quarter miles of feeder cables. Street lighting is at present confined to the High-street, Bishop-ton-lane, and part of Norton-road, and consists of thirty Crompton arc lamps. The price of supply is fixed on the Wright system, at 6d. per unit for the first hour's use per day and 2½d. per unit afterwards, the prices for power being 5d. and 1d. respectively. The estimated cost of the scheme is 26,500. Mr.

C. S. Vesey Brown, the electrical expert and adviser, gave a technical explanation of the scheme.

ELECTRIC LIGHT WORKS, DARTINGTON.—On the 17th ult. a large number of members of the Corporation of Dartington, and officials, assembled at the new electric lighting works in Haughton-road to witness the inauguration of the new system of lighting which has been undertaken by the Corporation at a cost of 20,000. The system as at present arranged is a three-wire continuous current of 460 volts. Messrs. Scott & Mountain, of Newcastle, have supplied the engines and dynamos; Messrs. Cox-Walker have provided the switch arrangements; Mr. J. R. P. Lunn was the engineer under Professor Kennedy. The mains have been constructed by Messrs. Calderer, of London. The building containing the engines, dynamos, &c., is from the plan of the Borough Engineer, Mr. Smith. The works are capable of supplying about 7,000 8-candle lamps.

INCORPORATED CHURCH BUILDING SOCIETY.—The Incorporated Society for promoting the enlargement, building and repairing of churches and chapels, held its usual monthly meeting on Thursday, December 20, at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. E. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Bristol, All Hallows, 150l. in lieu of a former grant of 110l.; Chichester, St. George, 315l. in lieu of a former grant of 300l.; Darwen, St. George, Lancs., 143l.; Exeter, Emmanuel, 370l. in lieu of a former grant of 350l.; Lower Sydenham, Christ Church, Kent, 255l.; Wilbury, St. Chad, near Gravesend, from an old mission building fund towards building St. Helen's Mission Church, Stapleford, near Nottingham, 15l. The following grants were also paid for works completed:—Waltham Cross, St. George, Middlesex, 500l. on account of a grant of 1,000l.; Aberayron, Holy Trinity, Cardigan, 40l.; Nettleton, St. Mary, near Chippenham, Wilts, 100l.; Cobert, St. Hubert, near Grampound-road, Cornwall, 10l.; Kensal Rise, St. Martin, Middlesex, 100l.; Castle Bytham, St. James, near Grantham, Lincs., 25l.; Little Ilford, St. Barnabas, Essex, 75l.; Cobridge, Christ Church, near Stoke-on-Trent, 20l.; Llandysilio, St. Tysilio, Pembro, 20l.; Streatham, St. Margaret, Surrey, 200l.; Boderin, St. Mervin, near Pwllheli, 40l.; Wandsworth Common, St. Mary Magdalene, Surrey, 70l.; Ruckford, All Saints, near Wilberdine, Devon, 15l.; Calford, St. Andrew, Kent, 30l.; Boscaste, St. James, Cornwall, 20l.; and Portmadoc, Carnarvon, 15l. In addition to this, the sum of 158l. was paid towards the repairs of eleven churches. The grants made at this meeting have nearly exhausted the funds at the disposal of the Committee. They plead earnestly to the friends of the church at large for liberal contributions to enable them to vote substantial grants and to continue the work which this Society has so successfully carried on during the past eighty-three years. During the present year 9,710l. have been voted in grants from the general fund, and 355l. from the Mission Buildings fund.

BRADFORD CITY COUNCIL.—The Bradford City Council has recently had under consideration a number of applications for the post of City Architect. There were originally seventy candidates, and of these six were selected to appear before the Finance Sub-Committee empowered to deal with the matter, on Monday last. The appointment was ultimately conferred upon Mr. F. E. P. Edwards, A.R.I.B.A., for some time chief assistant in the Architectural Department of the Liverpool City Surveyor (Mr. Thomas Sheldermine) and joint Hon. Secretary of the Liverpool Architectural Society.

THE SLATE TRADE.—The past year will, we believe, show a falling-off in the make of slates, both in Carnarvonshire and Merionethshire. Trade in the former has been brisk the while year, but in the latter there was a slight falling-off in the spring, owing to foreign competition. The quarry-owners, however, by an adjustment of prices, recovered the bulk of their trade. The past century has seen an immense increase in the slate trade. Some of the quarries were worked by the Romans, but in 1800 the number working, and output, were very small, the method of working, needless to say, being primitive. The tonnage went on increasing up to 1898, when the value reached 1,875,671l. Since then it has slightly decreased, owing to a falling-off at some of the older quarries, and as the area of the Bangor and Festiniog veins is comparatively small, nearly all being worked, it is not likely to increase. The tendency of late years has been to close unproductive quarries and concentrate the management of others, so we may look forward to their again coming into favour for investment, the trade being or which, with proper management, shows very good returns; but owing to the best paying quarries being in the hands of private individuals, or companies whose shares are not quoted, little is heard of the large profits made. The new century will no doubt see large savings

effected by the use of electric power. Electric power has already been adopted in some quarries and is certain to be more extensively used.

RESTORATION OF INVERNESS MARKET CROSS.—The old Inverness Market Cross, which has just been restored, was unveiled on the 24th ult. The cross has been placed in front of the Town Hall. The carving was executed by Mr. Andrew Davidson at Rome from designs by Mr. J. W. Gall, of Inverness.

SEDGWICK MEMORIAL BUST, BRIGHTON.—On the 26th ult. Sir Henry Irving unveiled a bust of the late Miss Amy Sedgwick, which has been placed in the Royal Pavilion, Brighton. The bust is the work of Signor Bozzano, who was employed by the Statuary Company, of London.

LEGAL.

TEMPORARY STRUCTURES UNLAWFULLY ERECTED.

At Marlborough-street Police-court, on Thursday, December 20 last, before Mr. Plowden, several builders were summoned at the instance of the London County Council for having, on or about the 27th of October, erected certain temporary stands to enable persons to view the march of the C.I.V.'s, some outside and some inside of various premises within the district of St. George, Hanover-square North, without having first obtained from the Council the necessary licence under Section 84 of the London Building Act. The offence was distinctly proved in each case, and the defendants were all fined in various amounts, with costs.

WORKMEN'S COMPENSATION ACT.

His Honour Judge Yates-Lee has entered the following judgment in a case heard at the Ashton County-court on the 13th inst., in which Joseph Hill, of 45, Peel-street, Dukinfield, claimed compensation for injuries alleged to have been sustained in the service of the plaintiffs, Messrs. Storrs & Co., builders, of Stalybridge. The claim was made under the Workmen's Compensation Act, 1897. His Honour, in the course of his statement, says:—The facts in this case are not in dispute. The applicant was employed at some premises where a building over 30 ft high was being constructed, and his leg was broken by an accident. The parties agree that he is entitled to compensation at 12s. 6d. per week. The applicant, in fact, was near the gate leading on to the premises, helping to load a cart, when he was injured. In the present case we have an uncompleted building on which machinery driven by steam has been used for the purpose of the construction, which machinery was in course of removal. I think that, on the principle enunciated in *Frid v. Fenton*, I must hold that this building was one on which machinery driven by steam was still "being used for the purpose of the construction" within the meaning of the section. The result is a little startling, but I think that it would be too thin a distinction to say that an accident in the one case gave a right to compensation, and not in the other. I think that it perhaps helps one a little to arrive at this conclusion to notice that the reference to the use of scaffolding and machinery is only meant to define a class of building to which the statute applies. I am sure, moreover, that it is most desirable, if possible, to avoid thin distinctions, which the workmen, to whom this statute is of the utmost importance, do not understand. In accordance with this view of the law I have signed an award for 12s. 6d. per week, the sum agreed upon, to continue during incapacity.—*Manchester Courier*.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

17,794.—**TREADS FOR FOOTWAYS, SUBWAYS, ROADS, &c.**: J. K. Kay.—In the footway, which may be formed of asphalt, concrete, or similar materials, are fashioned inclined channels which end abruptly in rises, and are protected from being worn away by means of strips of metal or wood; or the footway may be composed of wooden blocks or tiles of metal plates which are to be disposed in some such manner, the blocks being bevelled so as to form the requisite channel.

17,814.—**BAND AND ORCHESTRA STANDS**: H. H. Spital.—The inventor devises means for reflecting the waves of sound outwards. He forms the ceiling or soffit of the roof and the floor of the stand so that they shall present respectively a parabola in vertical section, and in horizontal section a circle or polygon, whereby the sound waves will be turned into directions parallel with the axes of the curves, through a focus about midway between the top of the base and the springing of the ceiling, the floor for the bandstand being raised above the base.

17,849.—**WATER-HEATING APPARATUS**: T. Pattison.—The external casing of the heater, which is after the "geyser" kind, constitutes a spiral water passage to which the supply pipe is joined; the water as it circulates is heated with a burner (gas or oil) which is put within the casing, and the water which rises to the top of the water passage, and so through sections which are made each of a plain disc and a spirally corrugated disc

fastened together, and so constituting another spiral water passage. In another shape of the contrivance the water is caused to circulate upwards making the sections dish-shaped.

17,853.—**CEMENT FOR DECORATIVE PURPOSES**: *Terranova Industrie, C. A. Kapferer and Schlemmer*.—For making a cement that will serve for purposes of decorative work, and for artificial stone and so on, a clay as free as possible from iron—such as pipe-clay or kaolin—is mixed with lime and with feldspar, also as free as possible from iron. To produce a cement similar to Roman cement the mixture should be burned to a temperature at which it will become clinker; for other cements that temperature should be exceeded. For the materials above-mentioned may be substituted kaolin, a siliceous anhydride, such as infusorial earth or waste silica, and carbonate of soda or some other alkali; or a substance that can be used as puzzolana may be obtained by mixing lime, quartz, sand or powder, and kaolin, to which alkali, feldspar, or fluorspar may be added, and grinding the admixture after it has been burned and used.

17,866.—**TILES FOR ROOFS**: N. Danbach.—Curved edges, stop-rips, recesses, and interlocking dove-tailed ribs are fashioned upon the tiles, whilst their top left-hand corners are cut away for the taking of keys of mortar to be inserted between the joints of mortar lengthwise and transversely. In the horizontal mortar joints strips of wire netting or of metal are inserted.

17,953.—**ELECTRICAL ARC-LAMPS**: J. Rathbone.—The lower carbon is carried by a split iron socket which is caused to slide within the lower portion of a vertical tube attached to the enclosed arc solenoid lamp, and the socket is sustained by a shunt coil placed around the tube's upper portion. Either mercury or a flexible wire or chain is used for an electrical connexion between the socket and the tube, the lower portion of the socket having a small tapered slot through which the mercury can pass, so as to check its movements. A casing encloses both the coil and the tube, the latter carrying a globe, upon whose upper end are mounted a collar and a screw plug that retain the upper carbon, and the joints are made air-tight.

17,994.—**FIRE-PROOF WALLS, PARTITIONS, &c.**: G. Fugman.—For building up fire-proof partitions or walls the inventor employs open-worked plates of metal which are coated on each side with plaster. In order to make the open-worked plates he cuts parallel slits in the metal sheets, and bends or corrugates the adjacent strips into opposed directions.

17,966.—**AN ARTIFICIAL GRANITE**: *Société Berthe & Cie.*—An artificial stone that will serve for use in making baths, bricks, tiles, columns, paving blocks, wall-linings, balustrades, statuary, &c., is formed by mixing in a cold condition certain parts of quartz, flint, glass sand, cork, grey or white cements, dust glass and flint, the articles being built up by the usual methods, and supported, if necessary, for a while with suitable frames. If glass is added to the compound, the goods are bathed in an acid. After the goods have become dry and set they can be polished, a good surface being ensured by the use of flint and glass having equal degrees of hardness.

18,011.—**A CONTRIVANCE FOR USE WITH PLANING-MACHINES**: H. E. Stone and S. Cheeld.—The inventors' object is to provide that the boards shall be planed to one uniform thickness. The contrivance to be attached to cutters, comprises machines that have rotating cutters, comprises springs which press the plan upwards against the flattened surface of an angle-plate before it is passed on to the cutters. A screw serves to adjust the height of the angle-plate which is carried between guides mounted upon a bracket.

18,012.—**CONSTRUCTION OF WALLS AND CEILING**: P. Taylor.—On to the surface of the wall or ceiling are glued narrow strips of cardboard in such a manner as to divide it into squares, rectangles, diamonds, or other regular geometrical shapes, and between the cardboard strips are fastened, with strips or beads screwed in their places, transparent panels or sheets (of glass or other materials) which have been backed with wall-paper or with some other decorative material. The wall-paper is sized, and over its back may be pasted sheets of paper or other material. For waterproofing purposes the backing should be varnished.

18,001.—**A FILTER BED FOR SEWAGE**: W. T. Scott-Moncrieff.—The invention relates to the bacteriological treatment of sewage. The filter bed has a series of discharge channels, which are set parallel to one another and are inverted, the sewage passing through perforations in the channels into a conduit, to which lead openings wherein are fitted some fans for drawing air through the filter bed.

18,133.—**VICES**: G. Hänsler.—The adjusting screw is protected from chips, dirt, &c., with a T-shaped or overhanging head, the jaws of the vice being carried upon a supporting rail with the head; the journals of the rail-ends are to be clamped in their bearings by means of screws, so that one can adjust the vice in any inclined position. One of the jaws engages with the adjusting screw, and the other jaw may be fixed in different desired positions upon the rail with a pin.

18,142.—**WINDOW SASHES**: E. I. Cooke and E. Cox.—Above the window-head is fixed a casing which takes the mounting of the pulley of one sash, the

cord being attached to the other sash without the use of nails and passed through holes in the window-head. The cord's knotted end is secured in a recess or hole cut in the sash-sill, wherein is cut a vertical groove, dove-tailed or otherwise.

18,146.—**AN APPARATUS FOR OPENING AND CLOSING WINDOWS**: J. H. Carland.—By one variation of the contrivance a cord that is passed over a pulley-run, turning upon a screw which carries a crank-pin, moves the window; the crank-pin is caused to slide within a slotted bracket affixed to the window. In another form the cord-pulley turns a worm which is geared with a toothed crank-rod, and in another form, adapted for a window that is hinged at its top, the pulley-run is mounted upon the window and the slotted bracket is fastened up to the frame. In the arrangement last described a tube that projects outwards from the window serves to protect the screw from the weather.

18,160.—**MOULDING OF BRICKS**: A. Swinney.—After the clay has been extruded from the pug-mill through the cutting-frame, it falls upon pallets disposed in sections so that they can be parted asunder by a set of cams upon a shaft which is rocked by a slotted link and a crank from another shaft. When the bricks thus separated have been propelled on to carrying-board, a crank upon the second-named shaft—which acts by means of a slotted link and rocking shaft—removes the board or table away from the pallets, whilst an increase of motion is imparted to the outer pallets by pins that project from under the pallet-boards and engage with grooves in the cams whose pitches vary in accordance with their distances from the centre.

18,164.—**FIREPROOF FLOORING**: J. C. Fender.—Skew-backs, in which are formed grooves for taking the plaster, carry the floor-blocks whose ends and sides are stepped; the blocks are fashioned with vertical side ribs, inclined side ribs, and central webs, and in the blocks are embedded plates or strips of wire gauze, perforated sheet metal, or expanded metal, similar strips or plates being also embedded in the skew-backs by which the girders' lower flanges are enclosed. For the ceiling, plaster recesses are formed in the blocks, which are made of calcined plaster. A non-conducting flake or skin of powder will form upon the blocks when they become exposed to the action of fire.

MEETINGS.

FRIDAY, JANUARY 4.

Architectural Association.—Professor Beresford Pite and Mr. R. Weir Schultz on "The Preparation of Studentship Drawings." 7.30 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. J. McLaughlin on "Ironwork" (at No. 47, Great Brunswick-street). 4.30 p.m.

SATURDAY, JANUARY 5.

British Institute of Certified Carpenters (Carpenters' Hall).—6 p.m.

MONDAY, JANUARY 7.

Royal Institute of British Architects.—Business meeting. Election of candidates for membership. At the conclusion of the foregoing business the chairman will move the adoption of the amendments and additions in the Paper of "Suggestions for the Conduct of Architectural Competitions." The Paper as revised was printed in our last issue. At the same meeting Mr. Lewis Solomon gave notice of his intention to move the following resolution:—"That the Institute is responsible for the inferior position of architects as compared with that of other professions, and that a committee be appointed to inquire into the causes of this inferiority of status and to suggest remedies." 8 p.m.

Leeds and Yorkshire Architectural Society.—Professor Baldwin Brown on "The Old English Village Church." 6.30 p.m.

Liverpool Architectural Society.—Mr. M. H. Baillie Scott on "The Planning of Small Country Houses." 6 p.m.

TUESDAY, JANUARY 8.

Institution of Civil Engineers.—Papers to be submitted for discussion:—1. "Glasgow Bridge," by Mr. B. Hall Blyth, M.A. 2. "Railway Bridge over the Fiteroy River, at Rockhampton, Queensland," by Mr. W. J. Doak, B.E. 3. "The Niagara Falls and Clifton Steel Arch Bridge," by Mr. L. Leffers Buck. 8 p.m.

WEDNESDAY, JANUARY 9.

Institute of Sanitary Engineers.—New Year's Presidential address.

Northern Architectural Association.—Mr. Allan Greenwell, F.R.S., on "Plumens: Its Application in Architecture and Engineering," with lantern illustrations. 7.30 p.m.

THURSDAY, JANUARY 10.

Institution of Electrical Engineers.—Mr. W. M. Mordey on "Capacity in Alternate Current Working," and, if time permit, Mr. J. B. C. Kershaw on "The Use of Aluminium as an Electrical Conductor, with New Observations upon the Durability of Aluminium and Other Metals Under Atmospheric Exposure." 8 p.m.

Sheffield Society of Architects and Surveyors.—Mr. H. J. Potter on "The Housing of the Working Classes." 7 p.m.

FRIDAY, JANUARY 11th.

Institution of Civil Engineers (Students' Meeting).—Address by Mr. Wilfrid Airey, B.A., on "Geodesy." 8 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. John McLaughlin on "Constructional Work" (at No. 47, Great Brunswick-street). 4.30 p.m.

Glasgow Architectural Craftsmen's Society.—Professor Gourlay, B.Sc., on "A Tour in Germany, Switzerland, and Italy," with light-slide illustrations. 8 p.m.

SATURDAY, JANUARY 12.

Dundee Institute of Architecture.—Mr. R. S. Douglas on "Architectural Decoration—(1) as Clothing; (2) as Structural." 8 p.m.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Public Offices.....	Hindley U.D.C.....	50l., 25l. and 10l.....	Jan. 18
Sewerage Scheme.....	Basford (Notls) R.D.C.....	Not stated.....	Mar. 25

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Electric Light Station and Destructor.....	Whitby U.D.C.....	Clerk, Council Offices, Whitby, Yorks.....	Jan. 8
Shed Roofing, &c., Wilburn-street.....	Salford Corporation.....	L. C. Evans, Town Hall, Salford.....	do.
Road Works, Devon-road, &c.....	Croydon Town Council.....	Borough Road Surveyor, Town Hall, Croydon.....	do.
Electric Lighting Station.....	Nuneaton U.D.C.....	J. S. Pickering, Civil Engineer, Council Offices, Nuneaton.....	do.
Engins House, Chimney, &c.....	Pemberton (Lancs) U.D.C.....	G. Caldwell, Architect, Penzance.....	do.
Main Sewers, &c., Dunham Massey.....	Bucklow (Cheshire) R.D.C.....	J. McKenzie, Engineer, 7, Market-place, Altrincham.....	do.
Walls, Fencing, &c., Banchoy, Altrincham.....	Farnworth (Lancs) U.D.C.....	A. Clynne, Architect, Aberdeen.....	do.
Steel Tram Rails, &c.....	Knaresborough R.D.C.....	W. J. Lomax, Civil Engineer, 11, Fold-street, Bolton.....	do.
Water Supply, Burton Leonard.....	Mirfield (Yorks) U.D.C.....	T. J. Rushbrooke, Borough Surveyor, High Wycombe.....	Jan. 9
Stoneware Pipes, &c., High Wycombe.....	Stockport Corporation.....	F. H. Hare, Civil Engineer, Town Hall, Mirfield.....	do.
Road Works, &c., King-street.....	Maldon (Cornwall) School Board.....	J. Atkinson, Civil Engineer, St. Petersgate, Stockport.....	do.
Tramcar Shed, Workshops, &c., Wellington-road.....	Maldon Town Council.....	O. Caldwell, Architect, Penzance.....	do.
School, Hamoor.....	Fulham Borough Council.....	C. S. Hatton, Court House, Gravesend.....	do.
Well Sinking, Essex-road.....	Nelson (Lancs) Corporation.....	C. Botterill, Civil Engineer, Town Hall, Waltham Green, S.W.....	do.
Drainage Works.....	Minchhead (Somerset) U.D.C.....	D. Conroy, Architect, 2, Bishop-street, Londonderry.....	do.
Additions to Hotel, Portstewart.....	Mr. C. W. Bunting.....	B. Hall, Civil Engineer, Town Hall, Nelson.....	do.
Pipe Culvert, Hibson-road.....	Manchester Corporation.....	Miss Tom, Fair-street, St. Columb.....	Jan. 10
House, Watergate, Mawgan, Cornwall.....	Stretford U.D.C.....	S. Short, Surveyor, King-street, Hursl.....	do.
Sewerage Works, &c., Queen-street.....	Saddleworth U.D.C.....	K. Comerford, Union Offices, Kilkenny.....	do.
Timber, Bricks, and Slates.....	Birkenhead Corporation.....	W. Badler, Borough Surveyor, Town Hall, Fowkesbury.....	do.
Stoneware Pipes.....	Leeds Corporation.....	C. S. Ayles, Surveyor, County Offices, Throwbridge.....	do.
Police Station, Cricklade.....	Sutton Gas Company.....	W. Butler, 63, Market-street, Dalton-in-Furness.....	Jan. 11
Boundary Wall, &c., Nelson-street School.....	Rugby U.D.C.....	E. F. Hooley, Shire Hall, Nottingham.....	do.
Granite and Slag.....	Kendal Corporation.....	R. H. Lucas, Civil Engineer, Town Hall, Kendal.....	do.
Sewerage Works, Weston.....	Derby Corporation.....	H. Sheppard, 3, North-parade, Bath.....	do.
Reservoir and Cast Iron Pipes.....	Levensham Borough Council.....	W. J. Tamlyn, Architect, Minchhead.....	Jan. 12
Market, The Parade.....	Wolverhampton Corporation.....	P. M. Beaumont, Architect, Maldon.....	do.
Coach Houses and Stables, Maldon, Essex.....	City Surveyor, Town Hall, Manchester.....	do.	do.
Alterations to 89, High-street, Maldon.....	Surveyor, County Offices, Northallerton.....	do.	do.
Sewer Diversion, Canal street, &c.....	H. Royle, Surveyor, Council Offices, Old Trafford.....	do.	Jan. 13
Police Station, Hovingham, near Malton.....	C. Browidge, Civil Engineer, 62, Corporation-st., Manchester.....	do.	Jan. 14
Bowhouse and Shelter, Old Trafford.....	do.	do.	do.
Portland Cement, Bricks, &c., Otham.....	H. Dickinson, 1, Whitehall-road, Leeds.....	do.	do.
Drainage Works, &c., Victoria Park.....	W. A. Baird Laing, Architect, 13, George-street, Edinburgh.....	do.	do.
Building Work, Victoria Park, Tranmere.....	O. M. Robins, Engineer, Oas Offices, Sutton.....	do.	do.
Transformer Chambers.....	D. G. Macdonald, Civil Engineer, Rugby.....	do.	do.
Cottage Hospital, Lerwick, Shetland.....	R. H. Lucas, Civil Engineer, Town Hall, Kendal.....	do.	do.
Retort House Buildings, &c.....	J. Lord, Civil Engineer, Town Hall, Halifax.....	do.	do.
Road Metal.....	A. Eaton, Architect, 6, St. James-street, Derby.....	do.	do.
Road Works, &c., Gillingate.....	Surveyor's Department, Town Hall, Catford, S.E.....	do.	Jan. 15
House, &c., Salfershebble.....	do.	do.	do.
*Chimney Shaft.....	do.	do.	do.
*Sewerage Works.....	do.	do.	do.
*Kerbing and Tarpaving.....	do.	do.	do.
Police Station, Court House, &c., Kewick.....	do.	do.	do.
Schools, St. Peter's-square, Wolverhampton.....	do.	do.	do.
Police Station, Alderley Edge, Cheshire.....	do.	do.	do.
*Alterations to Ordnance Survey Offices, Southampton.....	do.	do.	do.
Pipe Sewers, &c.....	do.	do.	do.
Additions to Workhouse.....	do.	do.	do.
Buildings, &c., for Refuse Destructor.....	do.	do.	do.
*Laying-out, &c., of Cemetery at Uppminster.....	do.	do.	do.
*Buildings for a Branch Public Library.....	do.	do.	do.
*Scaisons Court, &c.....	do.	do.	do.
*Post Office at Coventry.....	do.	do.	do.
*Coast Guard Buildings at Dungeness.....	do.	do.	do.
*Coast Guard Buildings at St. Maves, near Falmouth.....	do.	do.	do.
*Sewerage Works.....	do.	do.	do.
*Old Tramway Rails.....	do.	do.	do.
*School.....	do.	do.	do.
*Isolation Hospital next Burgess Hill, Sussex.....	do.	do.	do.
*Water Tower, &c.....	do.	do.	do.
Additions to Schools, Mitre-street, Burnley.....	do.	do.	do.
*Swimming Baths, &c.....	do.	do.	do.
Building Work, Jarratt-street, Hull.....	do.	do.	do.
Gun Store & Additions to Headquarters, Manchester Warehouse, Radford-road, Nottingham.....	do.	do.	do.
Eight Houses, Bramley, Leeds.....	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant.....	E. Sussex County Council.....	75l. per annum.....	Jan. 12
*Clerk of Works.....	Chelsea Guardians.....	3l. 1s. a week.....	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, p., iv, vi, viii, x, & xxx. Public Appointments, pp. xxvii, & xxx.

SOME RECENT SALES OF PROPERTY :

Table listing estate exchange reports with columns for date, agent, and property details. Includes entries for Jenkin & Sons, Dew & Sons, and others.

PRICES CURRENT (Continued). TILES.

Table of tile prices including Best plain red roofing tiles, Best Broseley tiles, and various other tile types with their respective prices.

WOOD.

BUILDING WOOD.—YELLOW.

Table of building wood prices for yellow wood, listing deals, fir timber, and various wood types with prices per standard.

JOINERS' WOOD.

Table of joiners' wood prices including White Sea, Petersburg, and various wood types with prices per standard.

Table of yellow pine and kauri pine prices, listing planks, logs, and various wood types with prices per cube.

Table of dry mahogany prices, listing Honduras, Tabasco, and other types with prices per standard.

JOISTS, GIRDS, &c.

Table of joists and girds prices, listing rolled steel joists, compound girds, and other types with prices per standard.

METALS.

Table of metal prices including iron, common bars, Staffordshire Crown Bars, and other types with prices per ton.

PRICES CURRENT (Continued). METALS.

Table of metal prices including sheet iron, galvanized iron, lead, zinc, and other types with prices per ton.

ENGLISH SHEET GLASS IN CRATES.

Table of English sheet glass prices in crates, listing various sizes and types with prices per delivered.

OILS, &c.

Table of oil prices including raw linseed oil, boiled oil, turpentine, and other types with prices per gallon.

VARNISHES, &c.

Table of varnish prices including fine elastic copal, best elastic carriage, and other types with prices per gallon.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

TENDERS.

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

BROMLEY (Kent).—For erection of house, Garden-road, for Mr. H. Weeks. Mr. James Pamphilon, architect, 21, Finsbury-pavement, E.C. Quantities by architect:—

[See also next page.]

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table of material prices including hard stocks, rough stocks, smooth brick, facing stocks, shippers, and various other materials with prices per 1000 or per yard.

Table of stone prices including Ancaster in blocks, Bath, Farleigh Down, and other types with prices per cube or per ton.

Table of slate prices including 10x10 best blue Bangor, 16x8 best, and other types with prices per 1000 or per 100 sq. ft.

Table of slate prices including 10x10 best blue Bangor, 16x8 best, and other types with prices per 1000 or per 100 sq. ft.

DEVONPORT.—For alterations to No. 23, Fore-street, for Mr. C. Burt. Mr. E. M. Leest, architect, Public Hall Chambers, Devonport.—
 Healy & Son £138 4/1 S. Perkins £119 14
 W. J. Oliver 133 10 Jenkin & Son 110 0
 Smith & Son 126 15 [All of Devonport.]

HENDON.—For portable shed for fire-escape, Hendon Station, for the Hendon Urban District Council. Mr. S. Slater Grimley, Engineer and Surveyor.—
 W. Pearce £148 0/0 Smith & Co. £106 12 9
 W. Cooper, Ltd. 125 0/0 Humphreys, Ltd. 87 0/0
 W. A. Fryer 115 0/0 Gardner & Hazell, 79 15 0
 Mitson & Co. 110 0/0 Smith & Co., Acze-
 Fredk. King 107 5 0 lane, Erixton*. 75 0/0

HENDON.—For 32 in. sewer, Mill Hill-road, for the Hendon Urban District Council. Mr. S. Slater Grimley, Engineer and Surveyor.—
 Bentham & Co. £745 R. Ballard, Ltd.,
 Merredew & Co. 595 Child's Hill, N.W. £497
 Killingback & Co. 577 Geo. Bell 472

LEICESTER.—Extension of warehouse in Newark-street, for Messrs. T. H. Downing & Co., Messrs. Tait & Herbert, architects and surveyors, Friar-lane, Leicester.—
 Contract No. 1.
 Richardson & Son £2,167 J. O. Jewsbury £2,005
 H. T. & W. Chambers 2,949 Johnson & Son 2,855
 H. Bland 2,910 Herbert & Son 2,830

Contract No. 2.
 Cort, Paul, & Russell & Sons £583 19 4
 Cormick 0/0 Gimson & Co.* 572 12 6

Contract No. 3.
 J. Getliffe £197 4 Rowlett £162 0
 Norman & Under- Wm. Trear* 155 0
 wood 169 10

Contract No. 4.
 Major £141 16 3 Feavey & Son, £120 0 0
 A. Shaw 129 19 9 Geo. H. Barker* 102 0 0
 W. A. Bauton. 123 10 0 [All of Leicester]

LONDON.—For alterations at the Hope and Anchor public-house, Camden Town, N.W. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.
 Quantities supplied.—
 Courtney & Fairbairn £1,200 Osborn & Sons £1,660
 Antill & Co. 1,185 Sheffield Bros.* 1,054

LONDON.—For erecting Nos. 178 and 180, St. John's-street, E.C. Mr. W. A. Hickman, architect, 34, Gresham-street, E.C. Quantities by Mr. L. Jacob.—
 Rudd & Son £5,358 Ashby & Horner.... £4,700
 Dore Bros. 5,255 Thos. Rider & Son 4,598
 E. Lawrence & Sons 4,950 J. W. Falkner &
 Staines & Son 4,857 Sons* 4,349

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon &c., 25s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 12s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

C. B. N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE. Telephone, No. 274 Holborn. (Price Address: "SNEWIN London.")

NEWTON ABBOT.—For the erection of boardroom and offices; additions, &c., to present room, for the Guardians. Mr. Samuel Sagar, architect, Union-street, Newton Abbot. Quantities by architect.—
 W. Bramble £7,169 0/0 W. A. Goss £4,825 0 0
 Mitchell & Son 6,464 11 0 L. Bearne,
 W. Gibson 5,620 0 0 Newton
 Parker Bros. 5,260 0 0 Abbot* 4,672 19 6 1/2
 F.A.A. Stacey 5,169 0 0

PUBLISHER'S NOTICES.

Telegraphic Address, "THE BUILDER, LONDON."

THE INDEX (with TITLE PAGE) for VOLUME LXIX (July to Dec. 1900) will be given as a supplement with our next issue.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (cloth), with Strips, price 6d. each. THE SEVENTY-NINTH VOLUME of "The Builder" (monthly, price Twelve Shillings and Sixpence, will be ready on

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 6s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

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Six lines, or under 8s. 6d.
 Each additional line 1s. 6d.

SITUATIONS VACANT, PARTNERSHIP, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS. Six lines (about fifty words) or under 4s. 6d.
 Each additional line (about ten words) 6s. 6d.

Terms for series of Trade Advertisements, and for front pages, and other special positions, on application to the Publisher.

SITUATIONS WANTED (single-handed—Labour only). Six lines (about thirty words) or under 2s. 6d.
 Each additional line (about ten words) 6s. 6d.

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ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN O'CLOCK on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in duplicate COPIES ONLY should be sent. Strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have Replies addressed to the Office, Catherine-street, Covent Garden, W.C. Free of charge. Letters will be forwarded if addressed envelopes are sent together with sufficient stamps to cover the postage. Unsent stamps go returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES. { NINEPENCE EACH. By Post (carefully packed) 1s.

J. J. ETRIDGE, JR.

SLATE MERCHANT, SLATER and TILER.

Penrhyn - Bangor, Oakeley - Portmadoc,

And every other description of Slates, except American, Ready for immediate delivery to any Railway Station.

PLASTERERS' LATHS (HAND-MADE)

ALWAYS IN STOCK.

Applications for Prices, &c., to BETHNAL GREEN SLATE WORKS

BETHNAL GREEN, LONDON, E.

THE BATH STONE FIRMS, Ltd.

BATH. FOR ALL THE PROVED KINDS OF BATH STONE. FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE, DOULTING STONE.

The Ham Hill and Doulting Stone Co. (Incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset. London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Scyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tumblers, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO'S, Ltd., INK-PHOTO PROCESS,

4 & 5, East Harding-street, Fetter-Lane, E.C.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

Telephone No. 424 Westminster. **MITCHIM & SON** (at GEORGE STREET, WESTMINSTER) "QUANTITY SURVEYORS' DIARY AND TABLES." For 1901, price 6d. post 7d. In leather 1/- Post 1/1.

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In all kinds of Hard Woods. Mahogany, Wainscot, Teak, &c. &c.

Wm. MALLINSON & Co.

Offices: 136 & 138, Hackney Road, London, N.E. Telephone: 1319 ABERN.

ASPHALTE

For Horizontal & Vertical Damp Courses. For Flat Roofs, Basements, & other Floors.

Special attention is given to the above by

THE French Asphalte Co.

Contractors to H.M. Office of Works, The School Board for London, &c.

For estimates, quotations, and all information, apply at the Offices of the Company,

5, LAURENCE POUNTNEY HILL, CANNON STREET, E.C.

TWELVE GOLD AND SILVER MEDALS AWARDED.

COPPER AND ZINC ROOFING.

F. BRADY & CO.

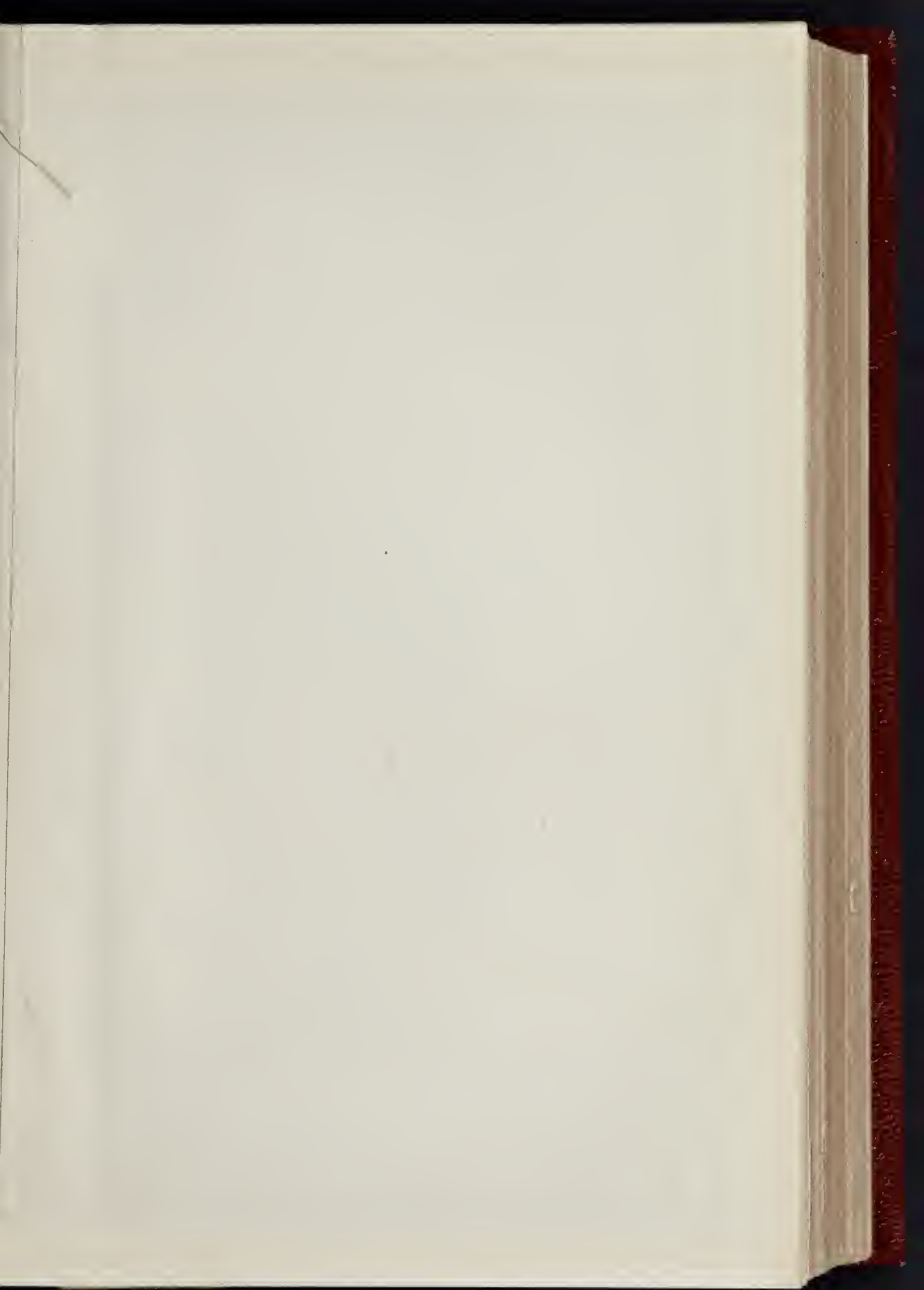
LONDON, LIVERPOOL, GLASGOW, BRISTOL.

352 to 364, Euston-rd., N.W. 6 & 8, Hatton Garden. 47 & 49, St. Enoch-square. Ashton Gate Works, Coronation-rd.

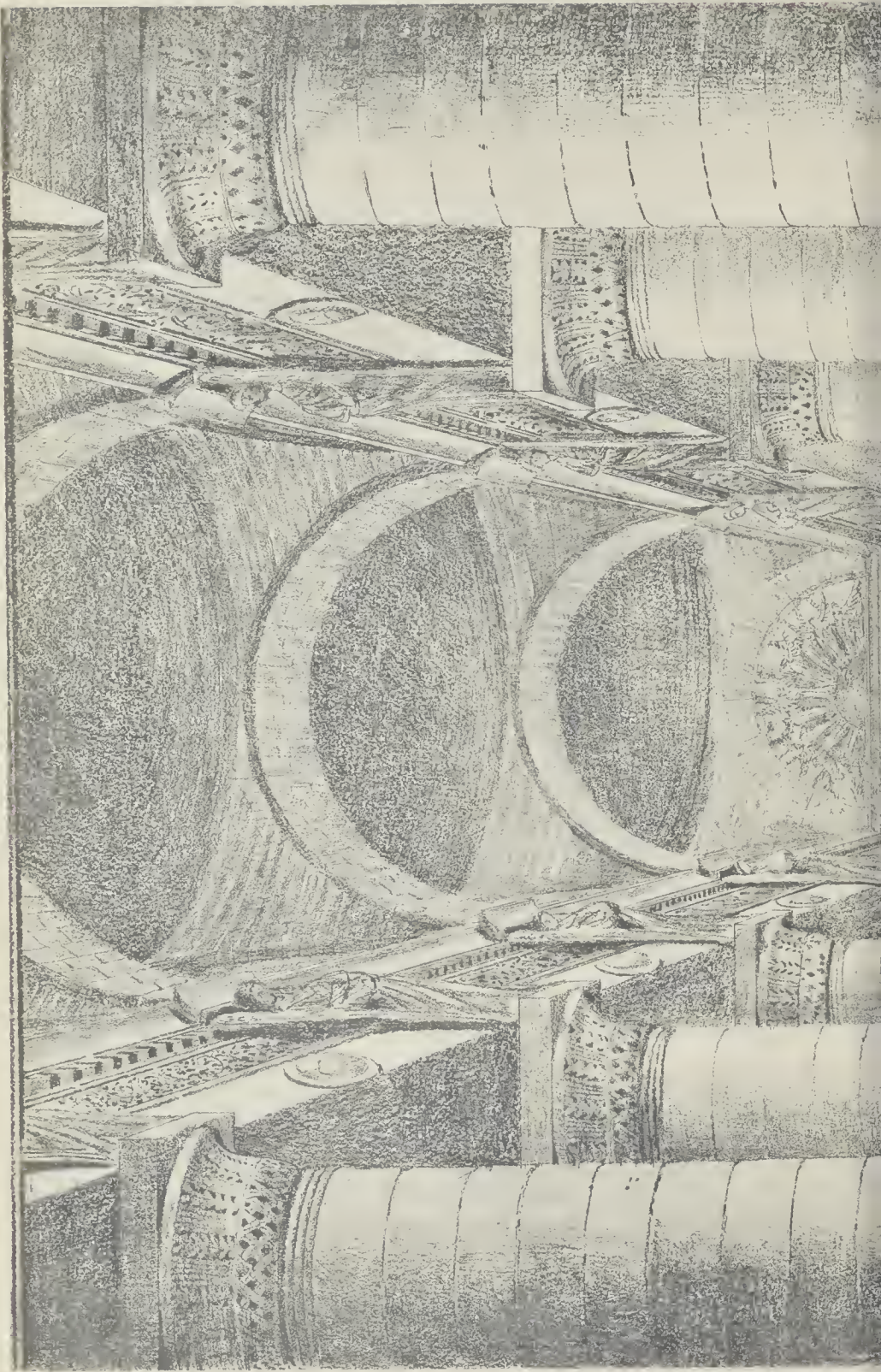
VEILLE MONTAGNE SOLE MANUFACTURING AGENTS.

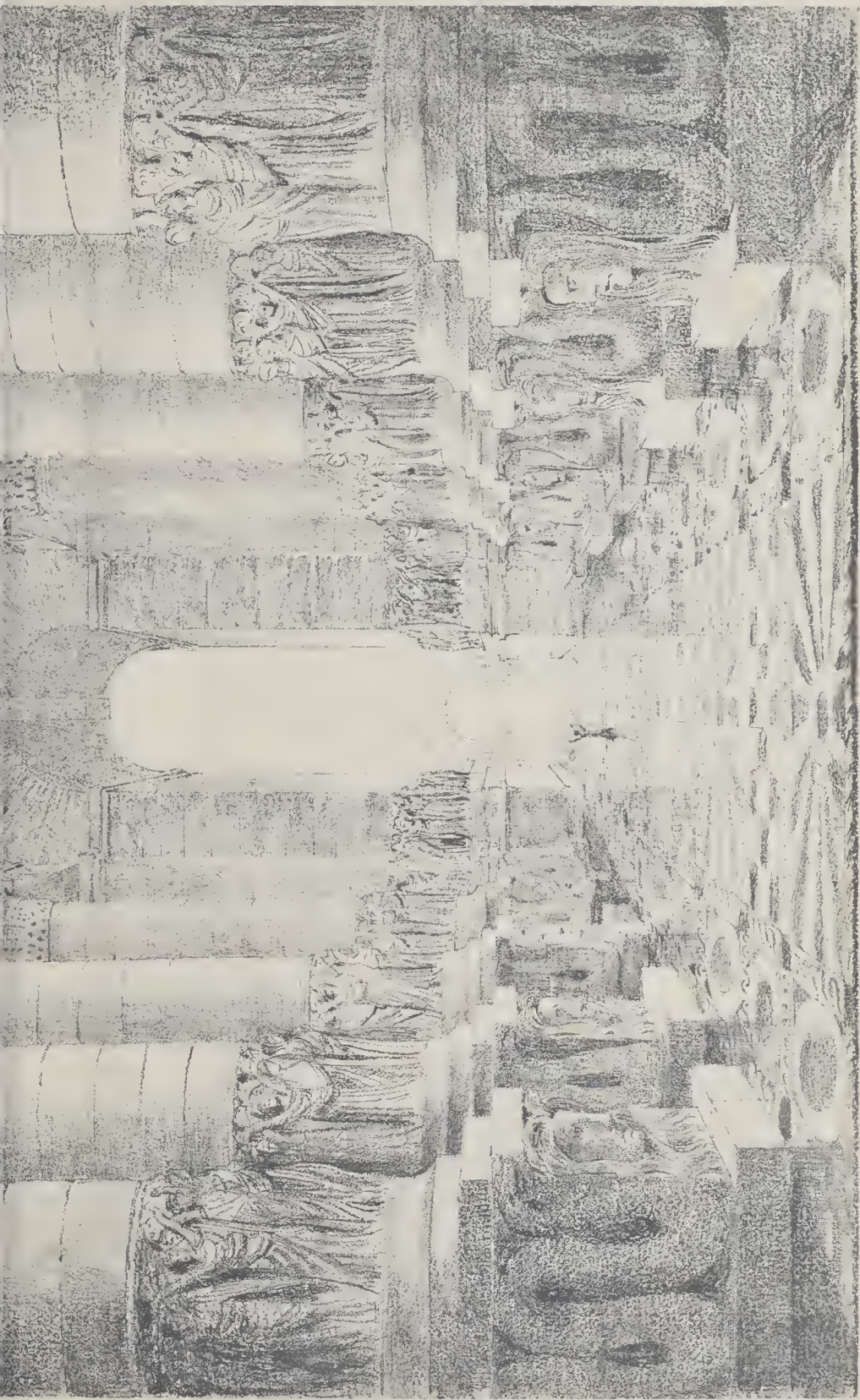
NO SOLDER. NO EXTERNAL FASTENINGS.

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.



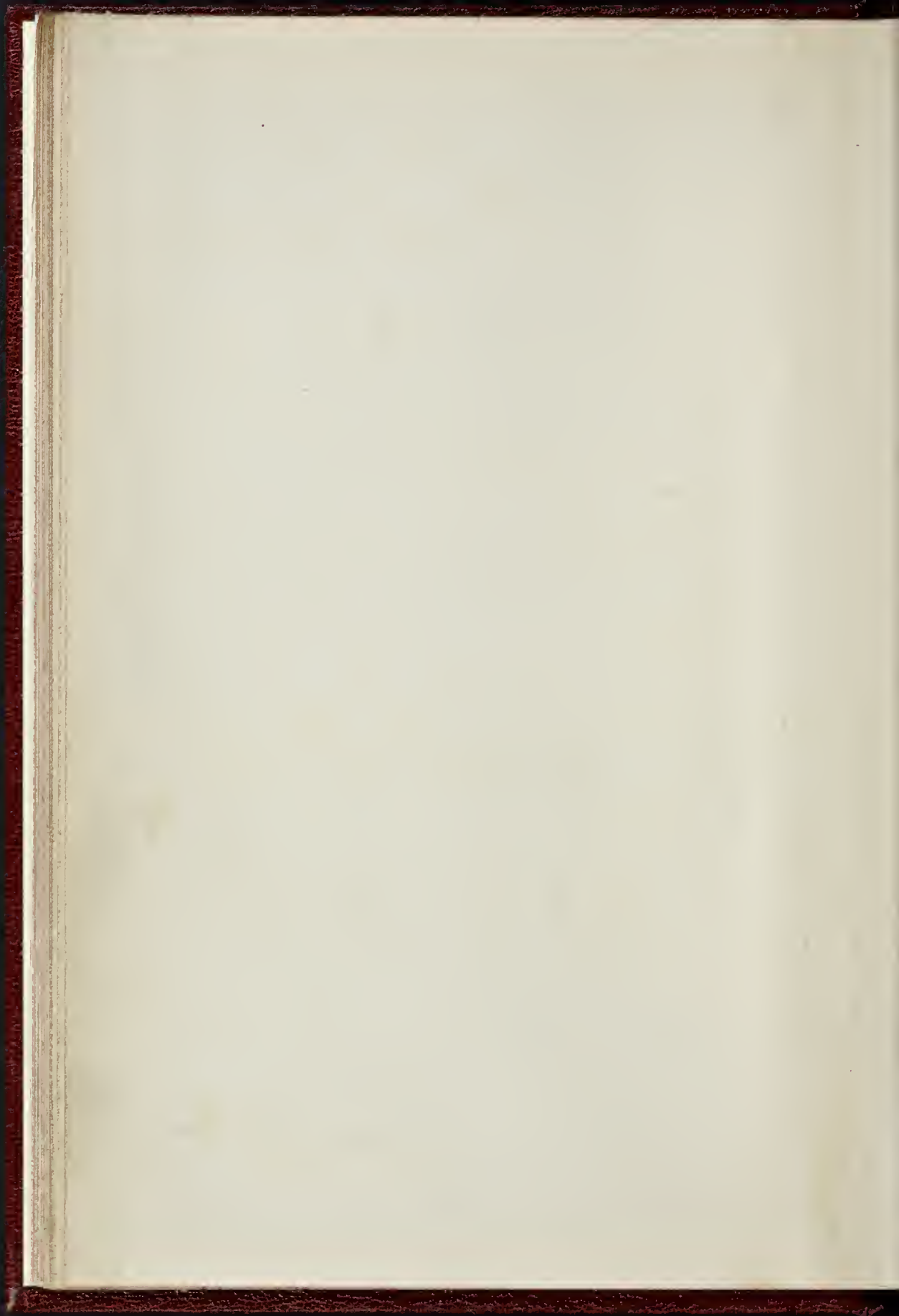
THE BUILDER. JANUARY 5, 1901





116 PHOTO SPACQUE & CO. 4 & 5 EAST HARDING STREET PETER JANE, E.C.

THE PORTAL OF THE NEW CENTURY AN EXTREMISME FANTASY -- BY THE EDITOR

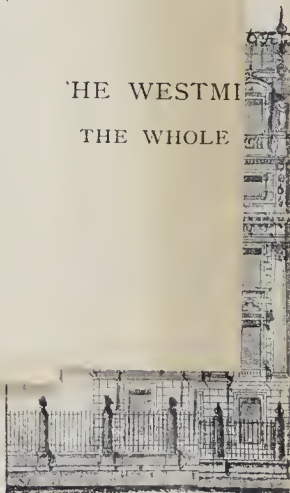




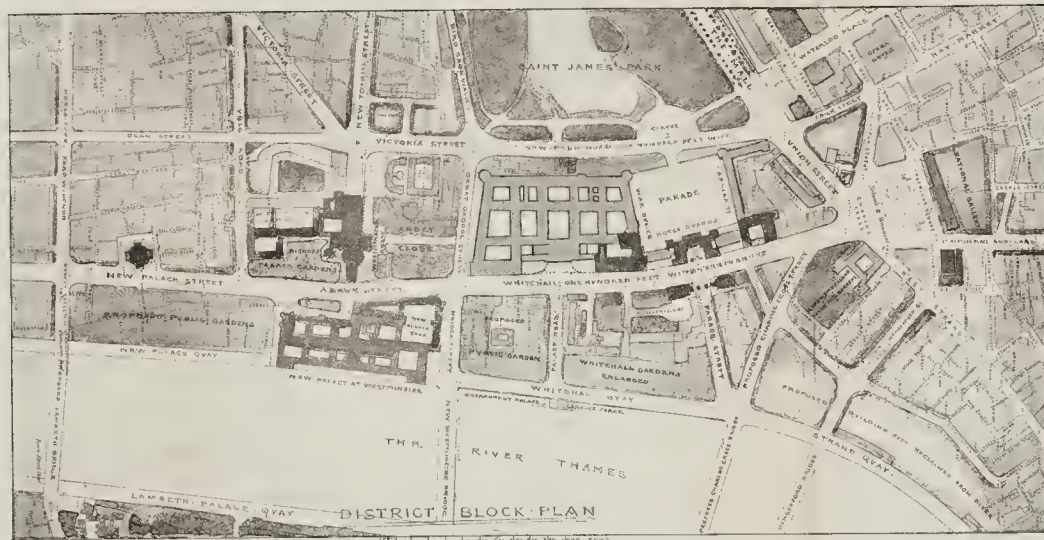
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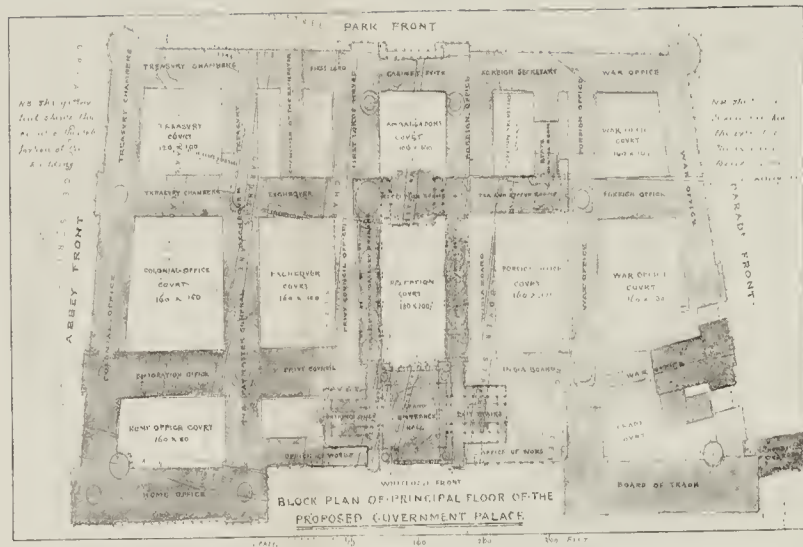
THIS DESIGN IS SUGGESTED FOR COMBINING THE PUBLIC OFFICES OF THE COUNTRY IN ONE MASS CONJUNCTION WITH THE EXISTING BOARD OF TRADE CHAMBERS & THOSE BUILDINGS BEING SO MODIFIED AS TO FORM ONE HARMONIOUS GROUP WHEREBY A CONSIDERABLE AMOUNT OF EXPENDITURE MAY BE AVOIDED & THE STYLE OF THE BUILDING BEING ITALIAN RECOVERED IS PROPOSED AS THE MOST STRIKING FEATURES OF THAT STYLE BEING A DOME WHICH WOULD CONFER GREAT IMPORTANCE ON THE EDIFICE AND WOULD FORM A PLEASING CONTRAST WITH THE NUMEROUS TOWERS OF THE ABBEY AND THE WESTMINSTER & THE DESIGN AS SHOWN BY THE BLOCK PLANS IS FORMED UPON THE PRINCIPLE OF CONTAINING THE WHOLE OF THE OFFICES IN ONE BLOCK IN PREFERENCE TO SEPARATE BLOCKS FOR THE REASONS RESPECTIVELY AS PROPOSED IN THE LATE COMMISSION REPORT BY THE GOVERNMENT & THE FOLLOWING ARE THE PRINCIPAL ADVANTAGES WHICH WOULD RESULT FROM THE ADOPTION OF THE SINGLE BLOCK PRINCIPLE AND CONVENIENCE IN THE PROMPT AND EFFICIENT CONDUCT OF PUBLIC BUSINESS - ECONOMY OF SITE WHICH WOULD BE MUCH LESS EXTENSIVE THAN WOULD BE NECESSARY FOR SEPARATE BLOCKS IF DETACHED FROM EACH OTHER SO AS TO BE SEEN TO THE BEST ADVANTAGE - ECONOMY OF COST NOT ONLY IN RESPECT OF SITE BUT ALSO IN RESPECT OF THE LESS EXTENT OF ARCHITECTURAL DISPOSITION WHICH WOULD BE NECESSARY TO THE MASS OF BUILDING REQUIRED TO PRODUCE A STRIKING AND IMPRESSIVE EFFECT WHICH WOULD BE PRODUCED BY BUILDINGS OF EXTRAORDINARY HEIGHT WHEN OF CONSIDERABLE HEIGHT AS PROPOSED IN THE DESIGN & WITH REFERENCE TO THE ARRANGEMENT

SIR CHARLES BARRY'S GREAT
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STORY ABOVE IT ARE PROPOSED TO CONSIST OF THE
CARRIAGE AND FOOT ENTRANCE WAITING HALLS AND
STAIRCASES OF EACH DEPARTMENT AND ALSO SUCH OF
THEIR OFFICES RESPECTIVELY AS ARE CONSTANTLY FREQUENTED
BY THE PUBLIC & THE PRINCIPAL FLOOR IS PROPOSED TO CONTAIN
THE ROOMS AND OFFICES OF THE CHIEFS, SUBCHIEFS, PRIVATE
SECRETARIES &c AND ALSO THE STATE ACCOMMODATION OF
THE BUILDING WHICH IS PROPOSED TO BE IN CONSTANT USE,
NOT ONLY BY THOSE FUNCTIONARIES BUT ALSO FOR
RECEPTIONS, POLITICAL CATHERINGS AND EVENING
RECEPTIONS. THIS PORTION OF THE BUILDING WOULD BE
APPROACHED FROM THE GATEWAYS FORMING THE MAIN
ENTRANCE OF THE OFFICE, BY MEANS OF SEPARATE
STAIRCASES FOR ENTRANCE & EXIT. THE STATE ACCOMMODATION
CONSISTS OF A GRAND ENTRANCE HALL [HAVING OVER IT A
DAPOT AND REGISTRY FOR ALL OFFICIAL RECORDS], AN
ENTRANCE GALLERY A SUITE OF RECEPTION ROOMS, TRAM AND
SUPPER ROOM, A STATE DINING ROOM CONNECTED WITH THE
FOREIGN SECRETARY'S RESIDENCE AND AN EXIT GALLERY &
ACCESS UPON ONE LEVEL TO THE WHOLE OF THE OFFICES IS
PROPOSED TO BE AFFORDED IN THIS STORY FOR THE CHIEFS
& OF EACH DEPARTMENT OF THE GOVERNMENT THE UPPER
STORIES OF THE BUILDING ARE PROPOSED TO CONTAIN THE
CLERKS OFFICES AND SERVANTS ACCOMMODATION OF EACH
DEPARTMENT. THE SEVERAL QUADRANGLES OF THE BUILDING
ARE PROPOSED TO BE COVERED OVER WITH GLASS, SO AS TO
AFFORD SHELTER TO CARRIAGES IN WAITING & AMONGST
THE LOCAL IMPROVEMENTS PROPOSED AS SHOWN BY THE
DISTRICT BLOCK PLAN THE MOST IMPORTANT ARE TWO

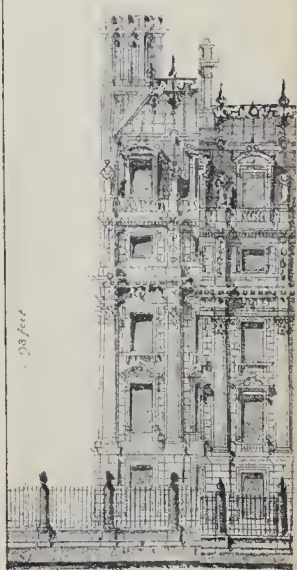
BRIDGES ACROSS THE THAMES ONE AT CHARING CROSS AND
THE OTHER AT LAMBETH AN EMBANKMENT OF THE RIVER THE
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BRIDGE AT LAMBETH A FORMATION OF A NEW ROAD OF A SIMILAR
WIDTH THROUGH ST JAMES PARK FROM VICTORIA STREET TO THE
MARKET WHICH ROAD WOULD MATERIALLY RELIEVE THE NORTH
AND SOUTH TRAFFIC PASSING TO AND FROM THE EAST AND WEST SIDE
OF LONDON. LARGE OPEN SPACES PLANTED AND LAID OUT ORNAMENTALLY
ARE PROPOSED TO BE FORMED IN CONTIGUITY WITH THE GREAT PUBLIC
BUILDINGS OF THE LOCALITY BY WHICH THOSE BUILDINGS WOULD BE
SEEN TO GREAT ADVANTAGE IN THEIR GROWING WITH EACH OTHER &
THE PARADE IS PROPOSED TO BE ENLARGED LEVELLED AND ENCLOSED
BY A LOFTY AND HANDSOME RAILING TOWARDS THE PARK AND BEING
SURROUNDED ON THE THREE OTHER SIDES BY THE OFFICES FOR THE
MILITARY AND NAVAL SERVICES OF THE COUNTRY A STRIKING AND
APPROPRIATE ARCHITECTURAL FEATURE OF THE LOCALITY WOULD BE
CREATED & THE OTHER LESS IMPORTANT IMPROVEMENTS ARE INDICATED
UPON THE DISTRICT BLOCK PLAN & THESE LOCAL IMPROVEMENTS HOWEVER
DO NOT INVOLVE THE DESTRUCTION OF ANY OF THE EXISTING PUBLIC
BUILDINGS ALTHOUGH SOME OF THEM MIGHT HEREAFTER BE REMOVED
WITH ADVANTAGE. IT MAY BE WELL TO OBSERVE THAT THE TWO NEW
OFFICES MOST URGENTLY REQUIRED MIGHT BE IMMEDIATELY BUILT
IN ACCORDANCE WITH THIS DESIGN UPON UNOCCUPIED GROUNDS BELONGING
TO THE CROWN AND WITHOUT DISTURBING EXISTING ACCOMMODATION IN
DOWNING SQUARE. THE STATE PORTION OF THE BUILDING MIGHT BE
NEXT ERRECTED PARTLY UPON GROUNDS BELONGING TO THE CROWN
AND PARTLY UPON OTHER PROPERTY BUT WITHOUT EXCEEDING THE
LIMITS OF CHARLES STREET ALREADY AUTHORIZED TO BE PURCHASED
BY PARLIAMENT. IN SHORT THE PRINCIPLE OF THIS DESIGN
ADMITS OF AS LITTLE OR AS MUCH BEING CARRIED OUT FROM
YEAR TO YEAR AS PARLIAMENT MIGHT DEEM TO BE EXPEDIENT



ARCHITECTURAL SCHEME FOR GOVERNMENT OFFICES AND THE WESTMINSTER DISTRICT. SHEET I.
THE CONCENTRATION OF THE GOVERNMENT OFFICES, AND BLOCK PLAN OF THE WHOLE DISTRICT AS PROPOSED TO BE LAID OUT.

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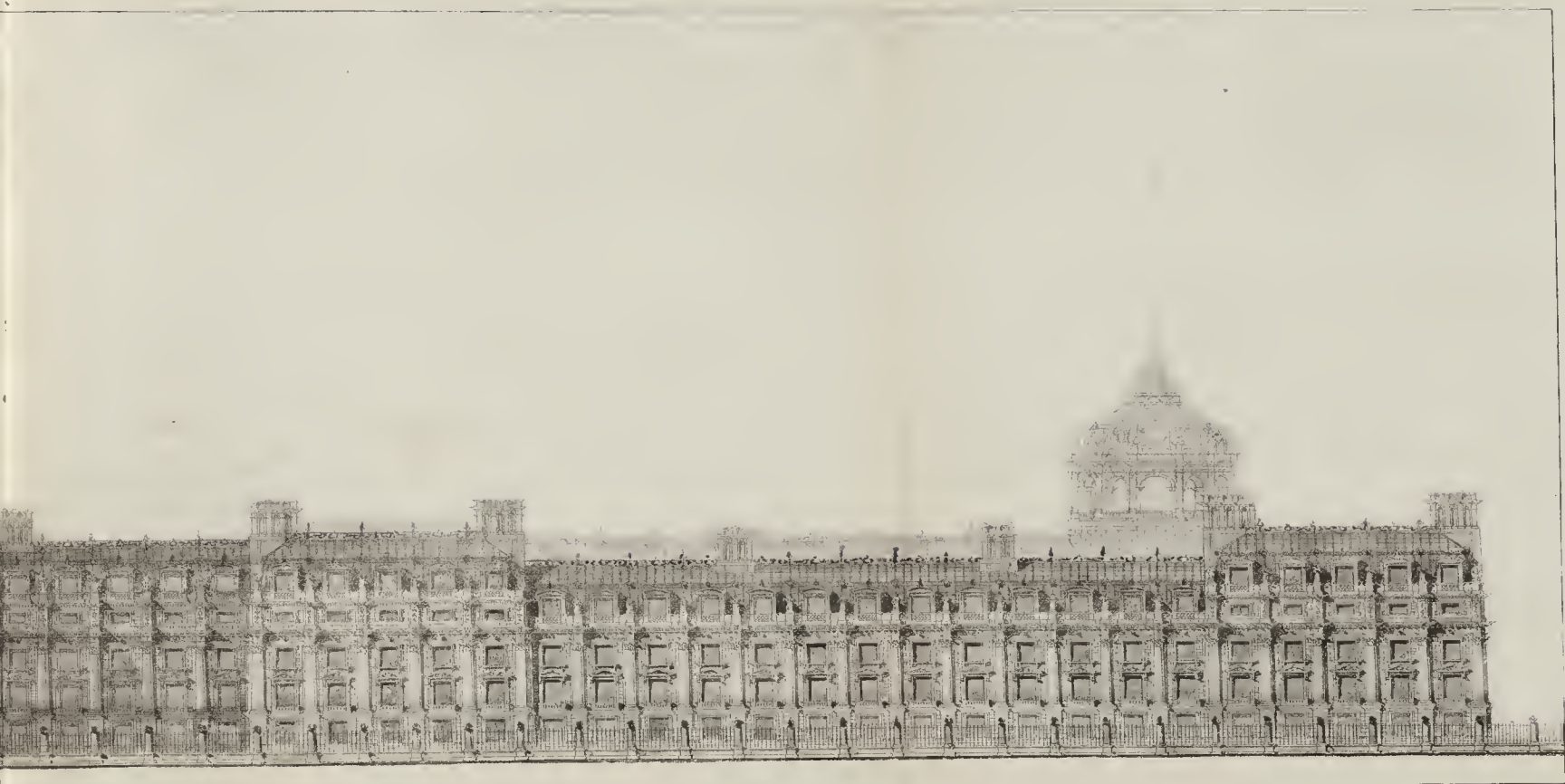


DESIGN



DESIGN FOR NEW PUBLIC OFFICES ELEVATION TOWARDS WHITEHALL

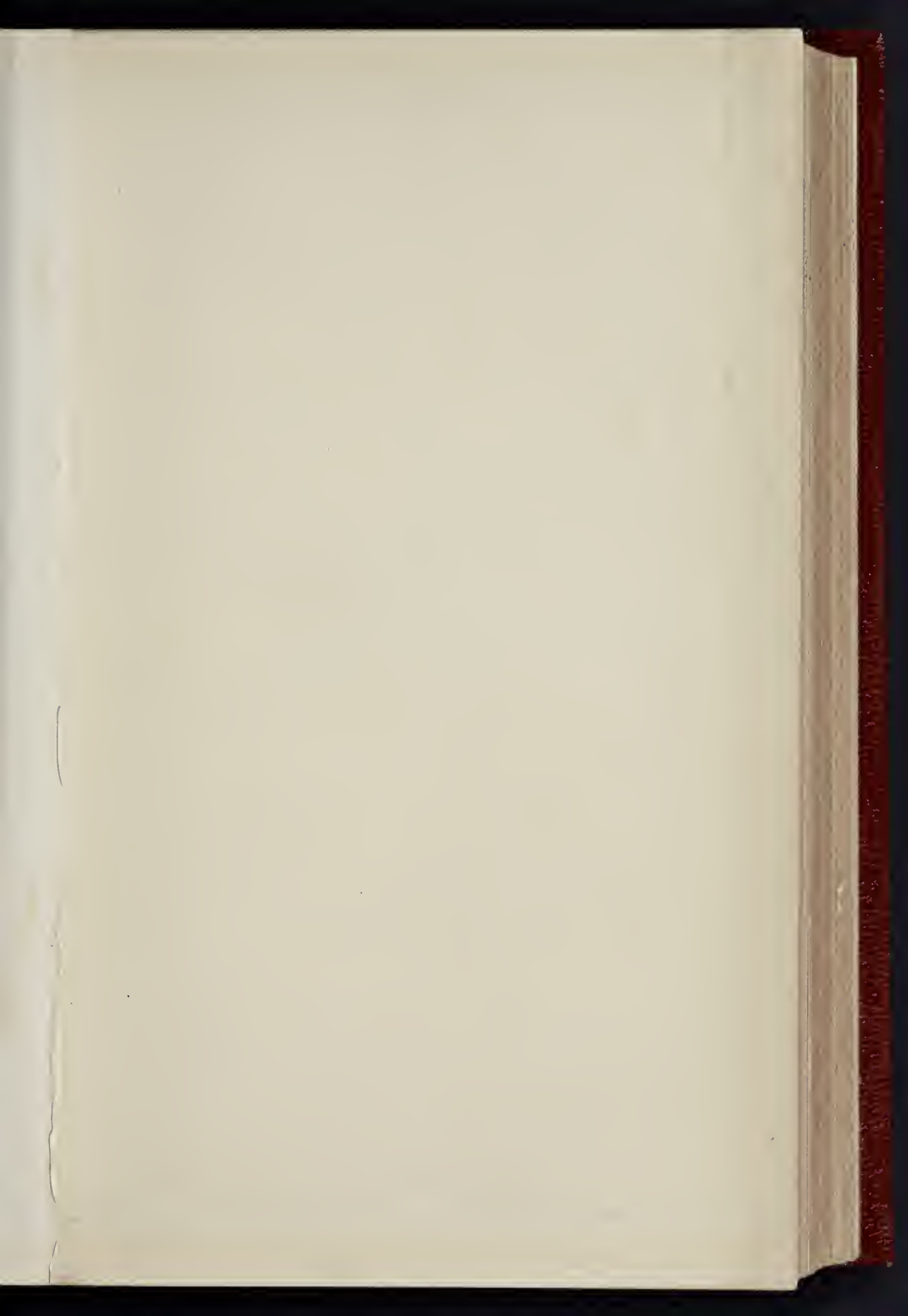
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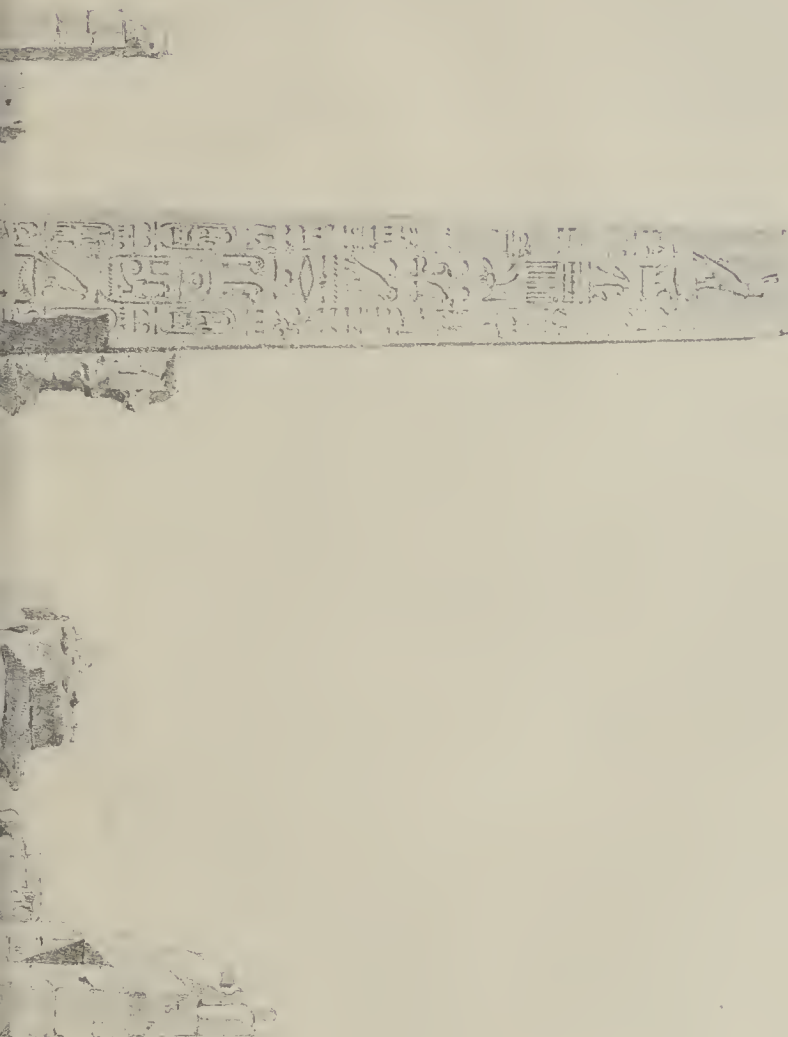


DRAWING OF THE RUINS OF KARNAC, MADE BY SIR CHARLES BARRY
PROBABLY ABOUT 1818, DURING HIS EARLY TOUR IN EGYPT AND GREECE.

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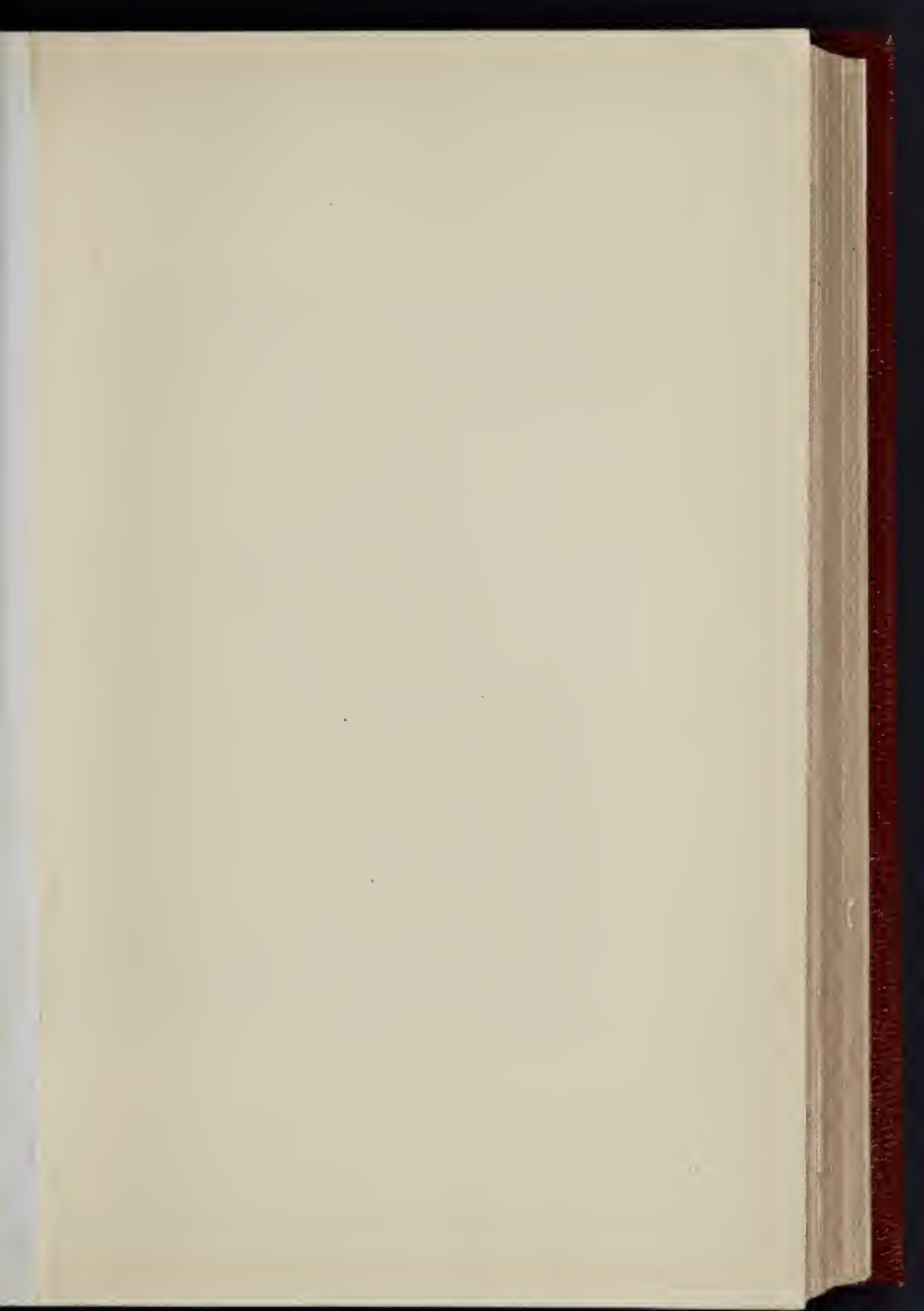
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THE BUILDER, JANUARY 5, 1901.

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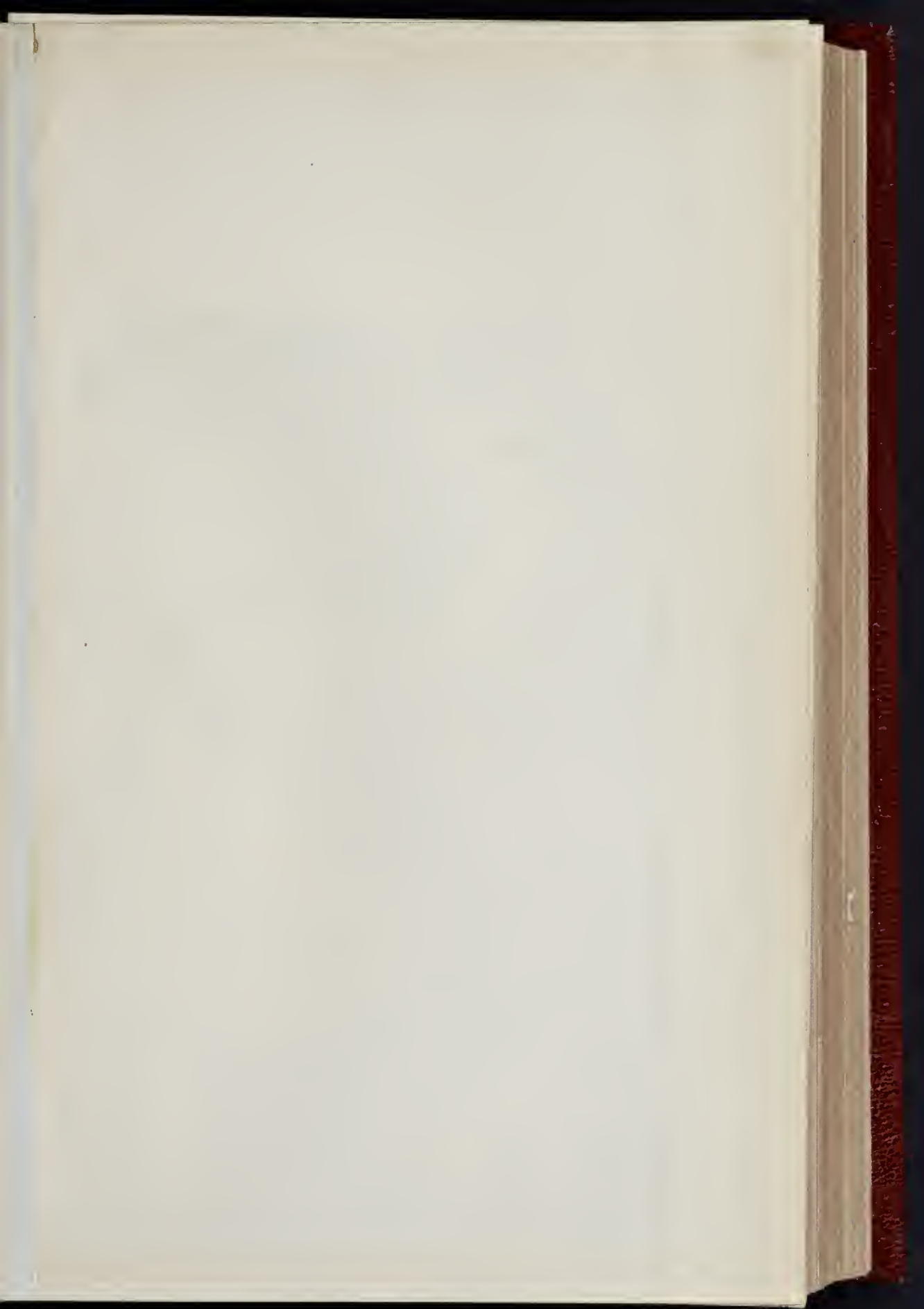




Springue & Co., Ltd., 4 & 5 East, Harrow St., Fetter Lane, E.C.

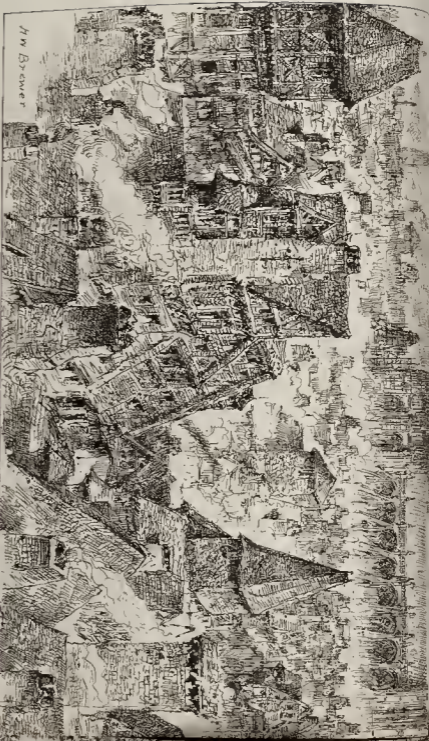
THE SMALLER ART PALACE ON THE CHAMPS ELYSÉES, PARIS.—M. GIRAULT, ARCHITECT.
THE PRINCIPAL FAÇADE.

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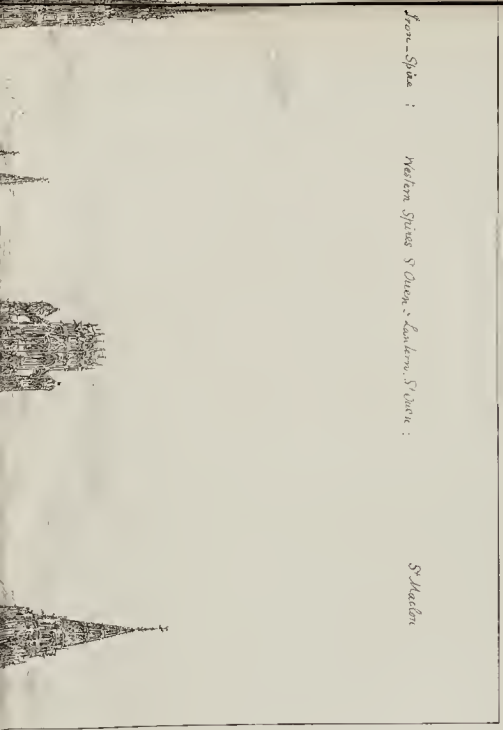
M. H. W. BREWER,





Form of Cathedral Gothic: Butler Tower: St Romanus Tower: Cathedral:

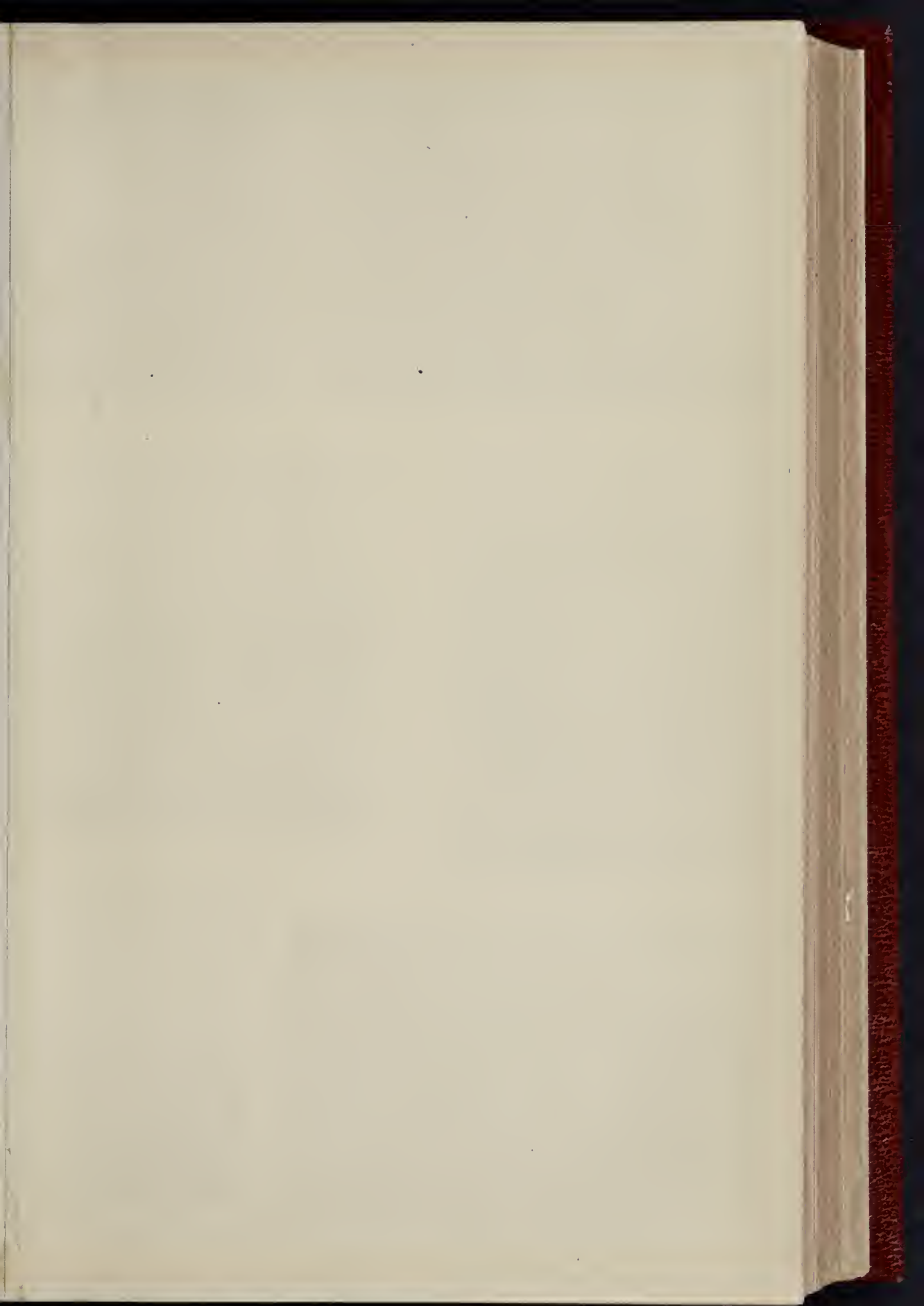
THE BUILDING 1800



from-Spina: Western Spire of Queen's Chapel: Spire:

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RURAL MILLBANK.



MILLBANK PENITENTIARY.



OLD BRIDEWELL GATE.



OLD WEST LONDON BRIDGE.



THE PAINTED CHAMBER.



THE HOUSES OF PARLIAMENT.



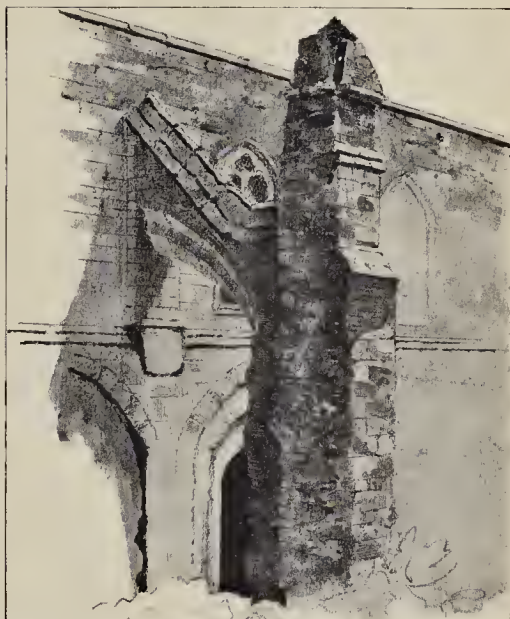
TIARY.



NEW PALACE YARD.



STER BRIDGE.



BUTTRESS, WESTMINSTER HALL.



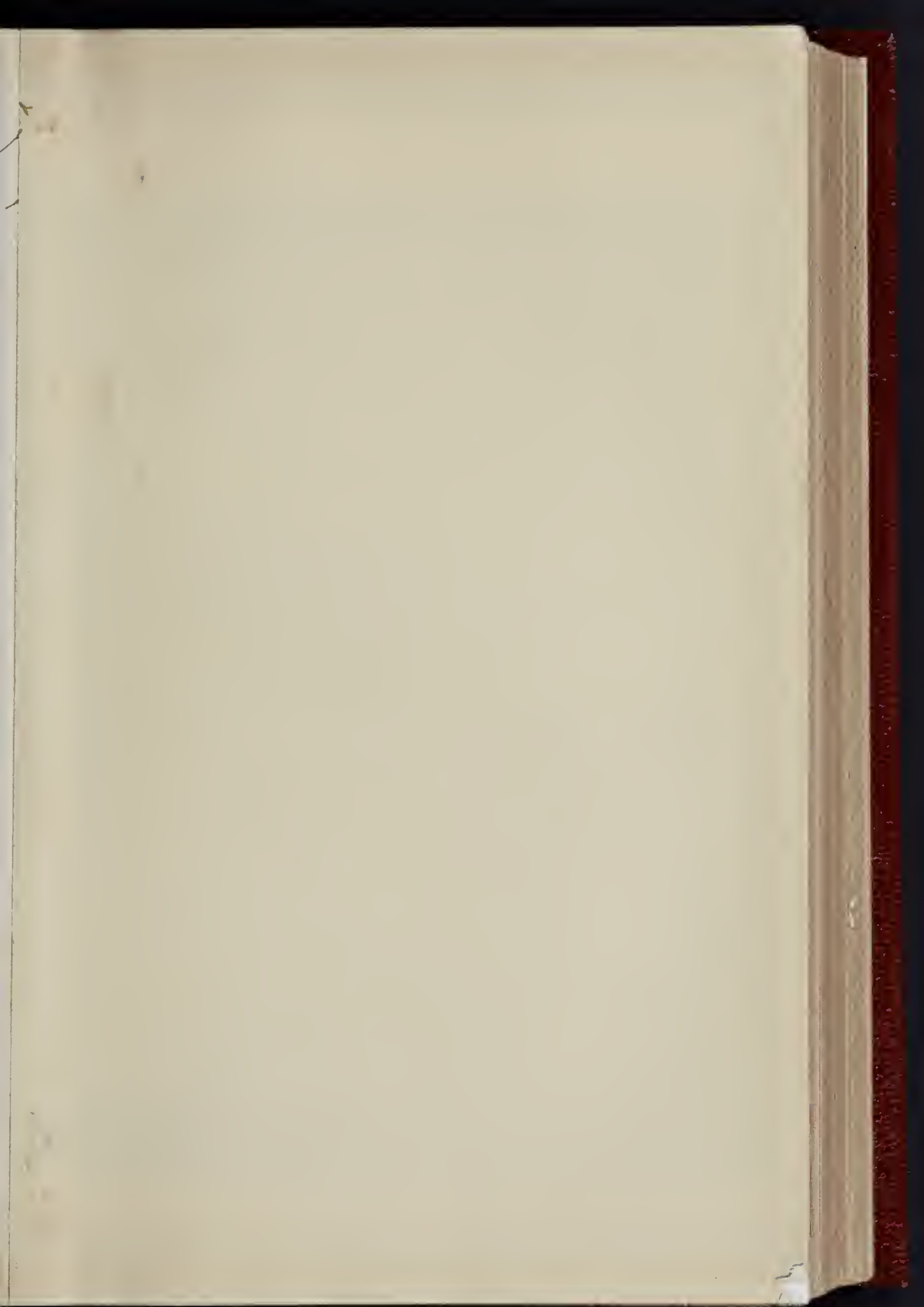
ARDS AND COMMONS.

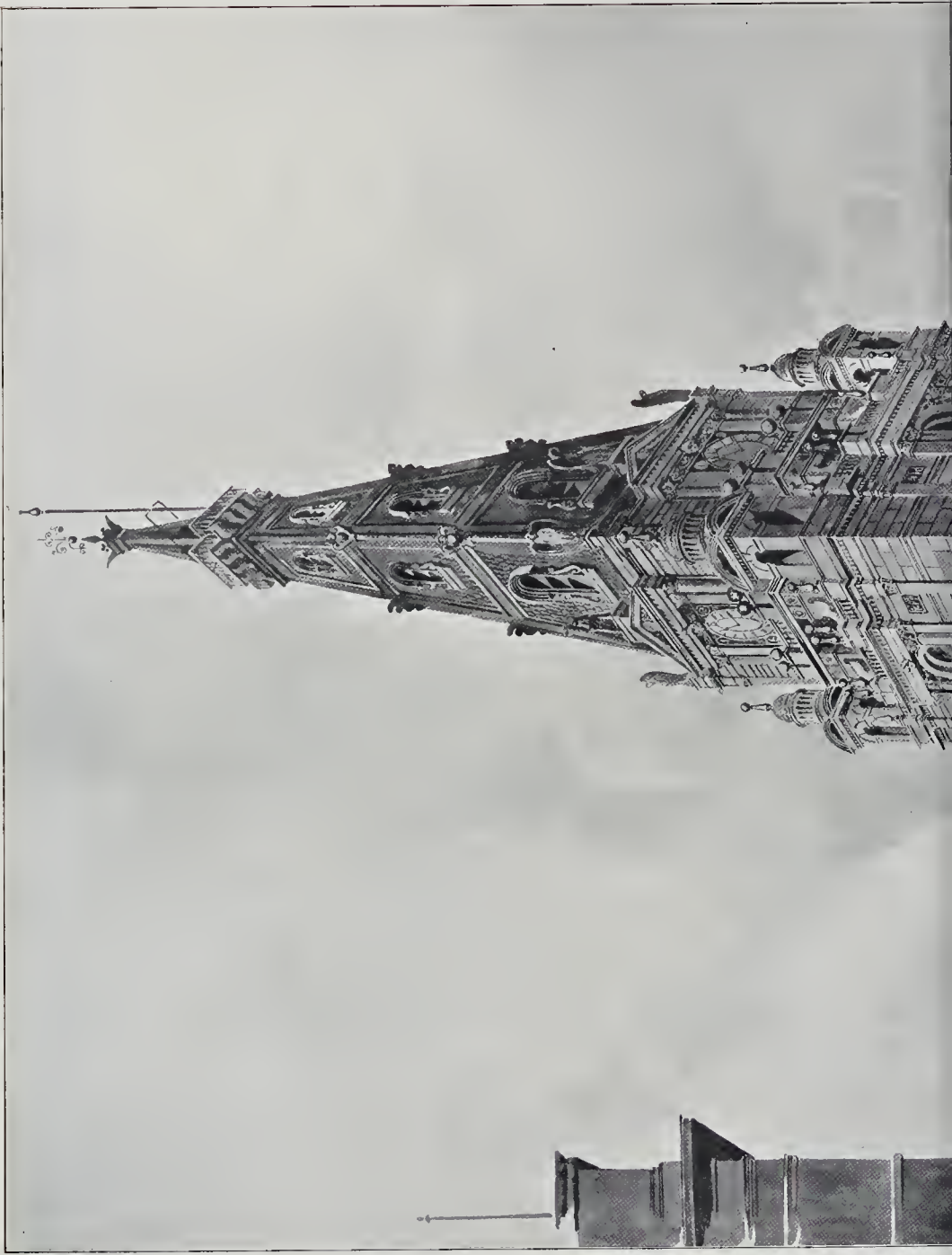


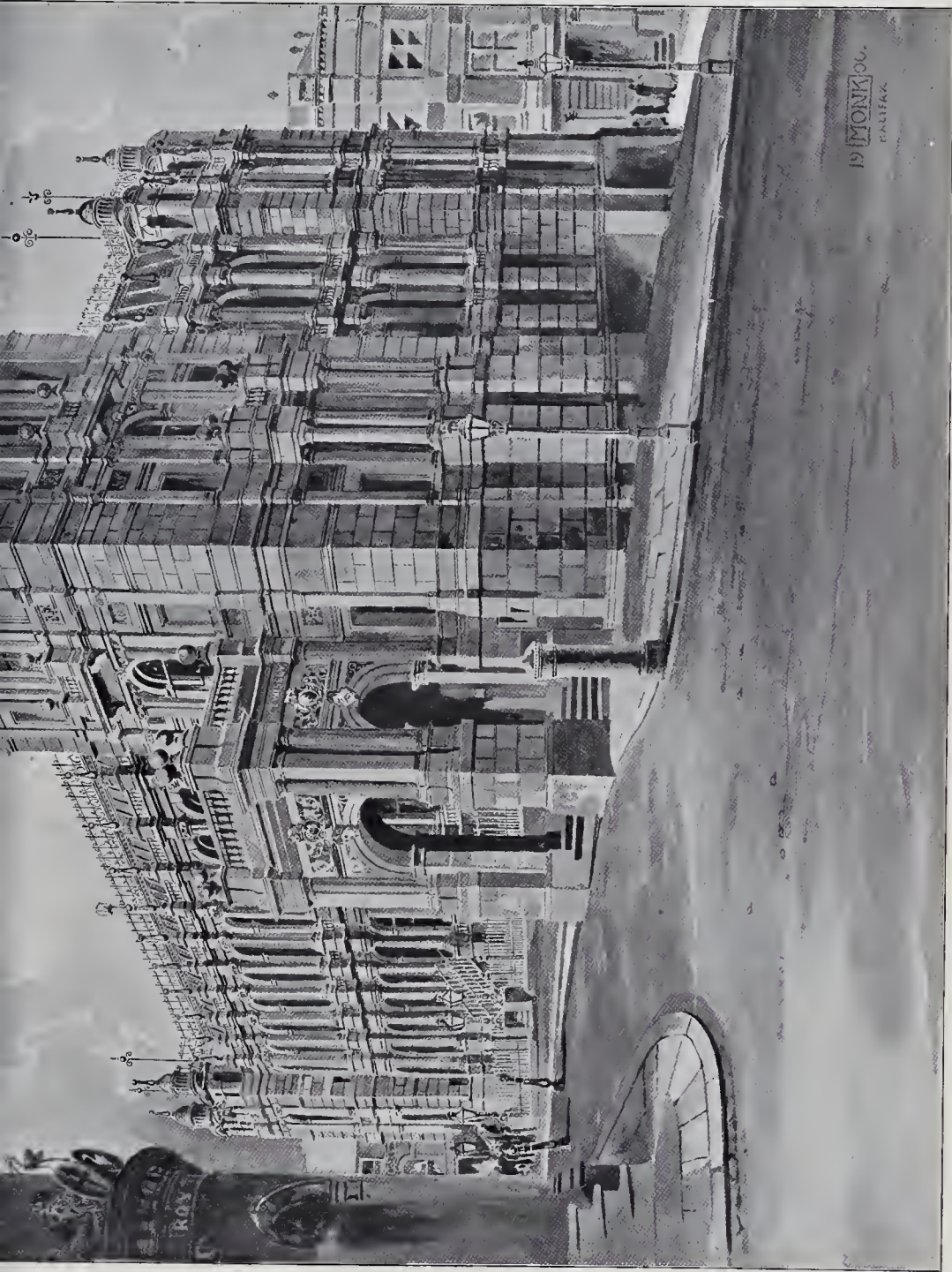
SOUTH-WEST ANGLE, CLOISTER COURT, HOUSE OF COMMONS, AFTER THE FIRE OF 1834.

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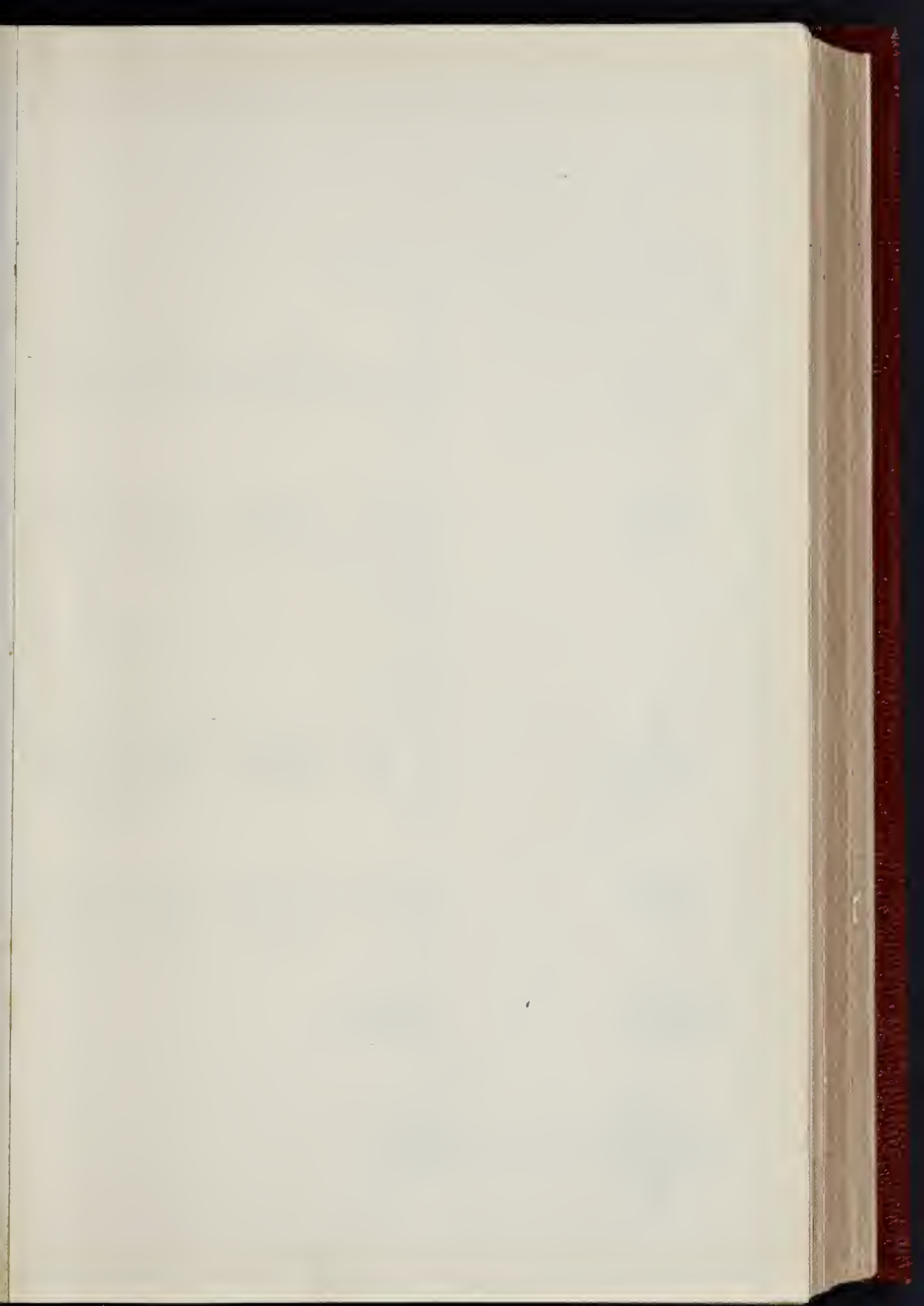


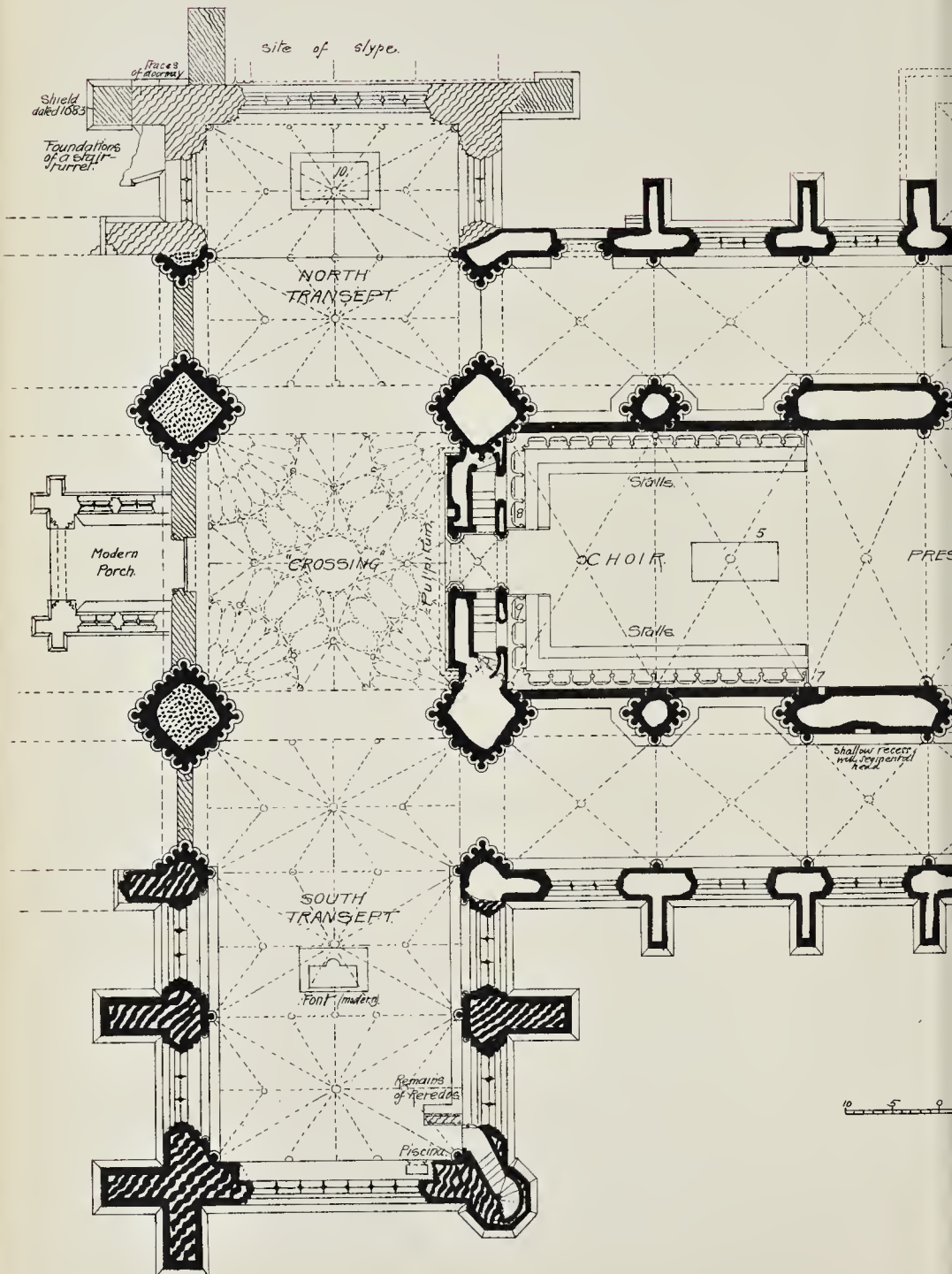


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THE TOWER OF HALIFAX TOWN HALL: THE LAST WORK DESIGNED BY SIR CHARLES BARRY

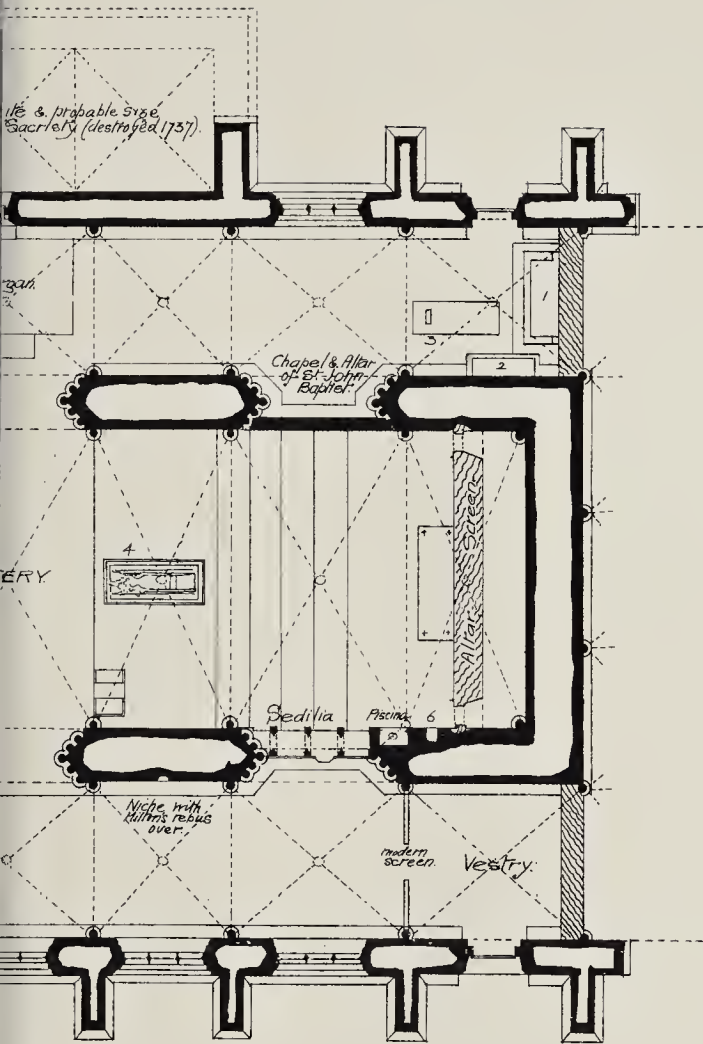






MILTON ABBEY

Ground-Plan of Church.

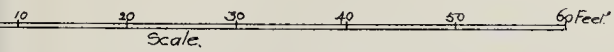


Monuments, etc.

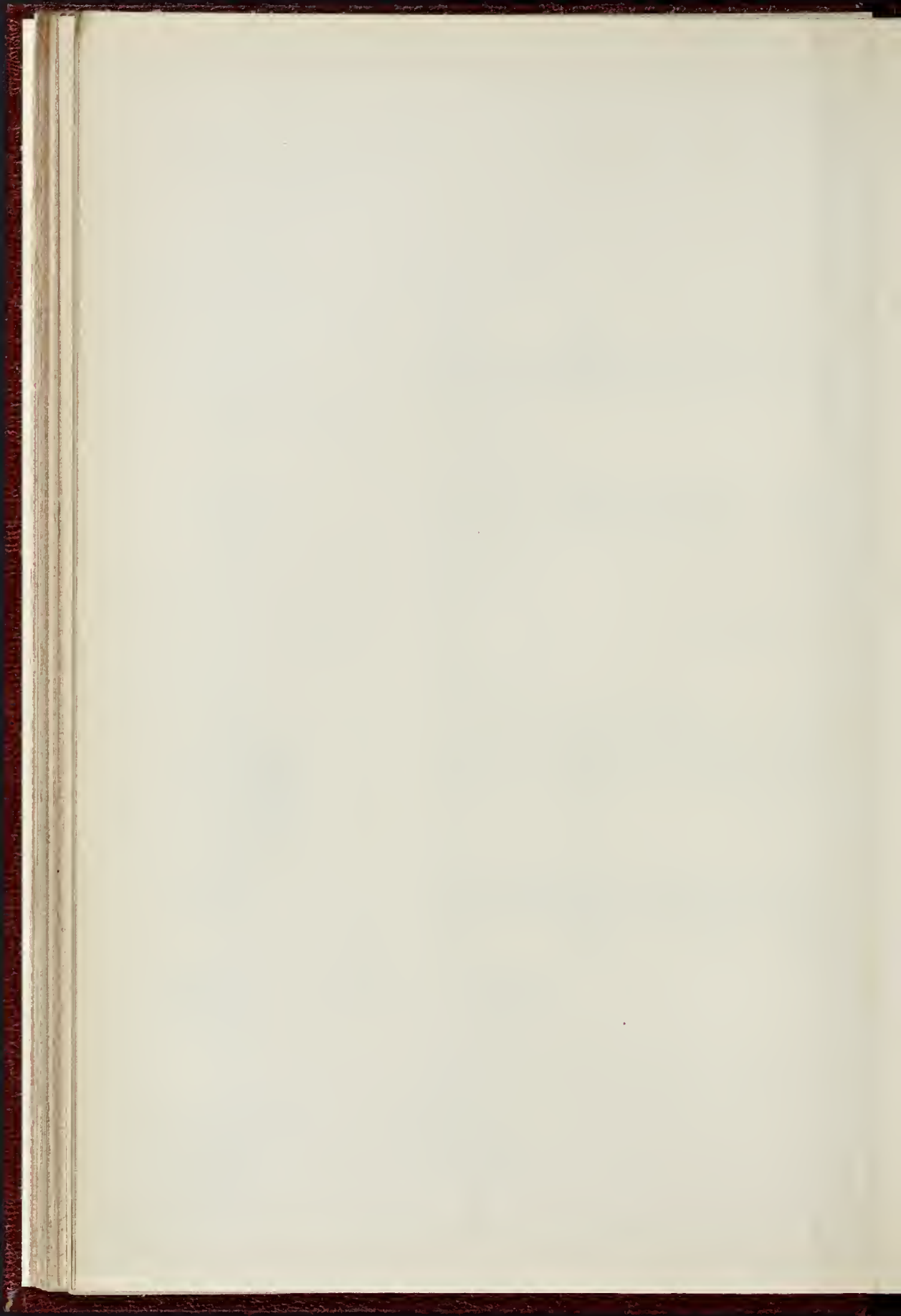
1. Bonch's monument
2. Tregonwell & brass.
3. Brass of John Artur, monk.
4. Matrix of brass of Abbot Waller
5. Grave-stone.
6. Traces of Norman arch.
7. Traces of Norman arch
8. Panel paintings of King Athelstan
9. & his Queen.
10. Damer monument.

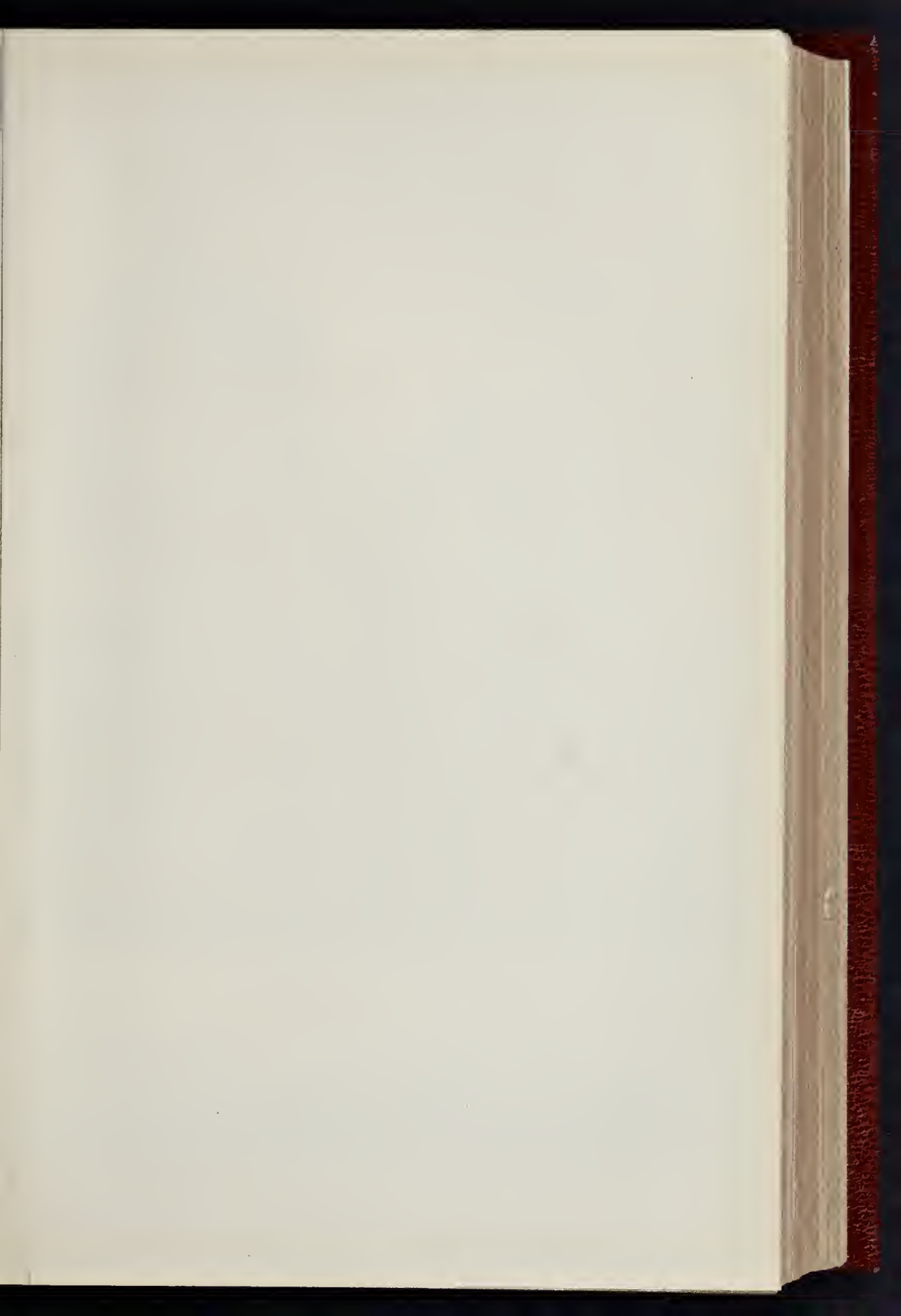
Site of Lady Chapel.

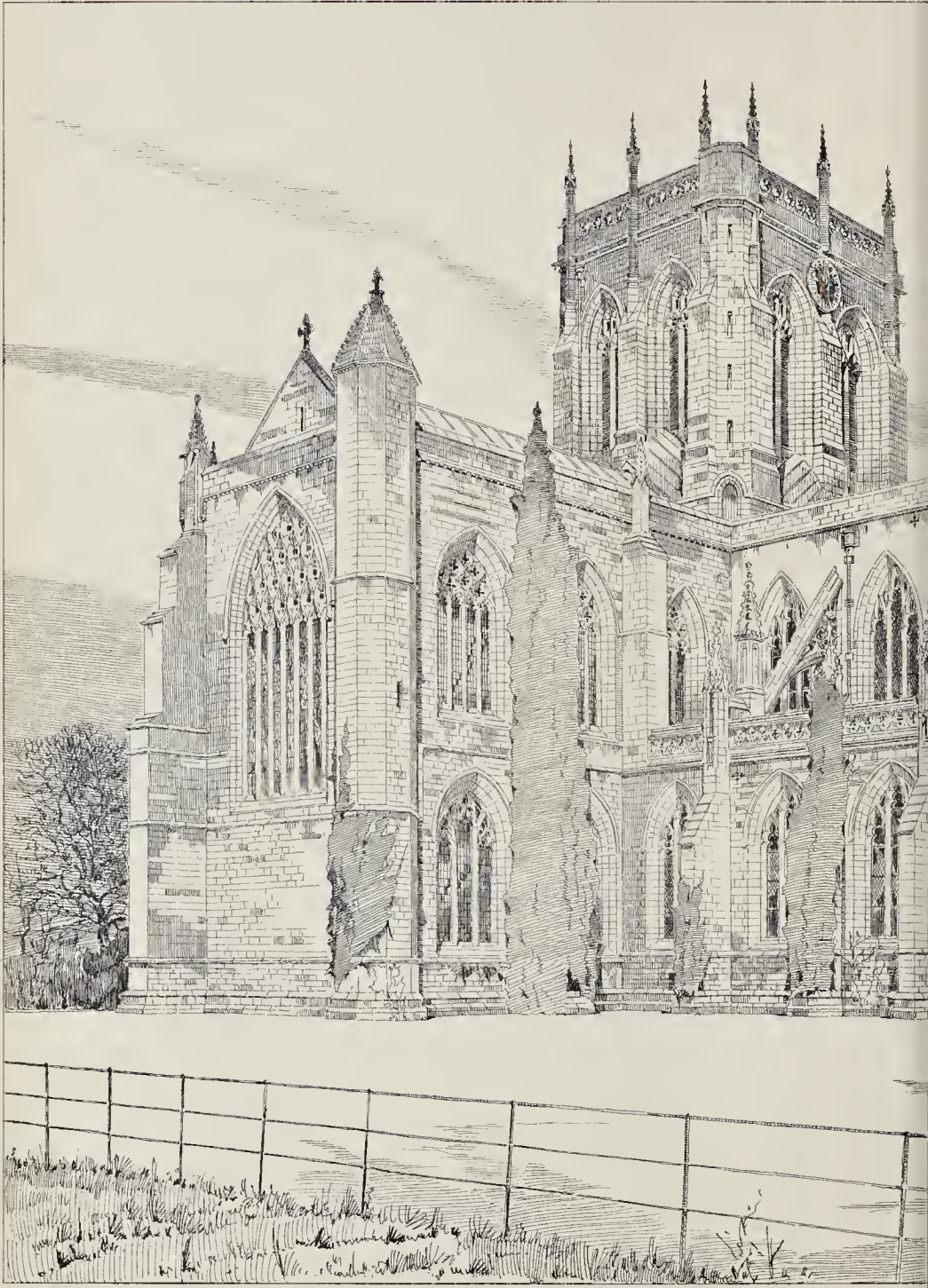
- 1st Decorated
- 2nd "
- 3rd "
- Perpendicular.
- Post-Reformation.
- Modern.



Prof. Geo. Paul
 1890







THE ABBEYS OF GREAT BRITAIN

DRAWN BY MR. [Name obscured]

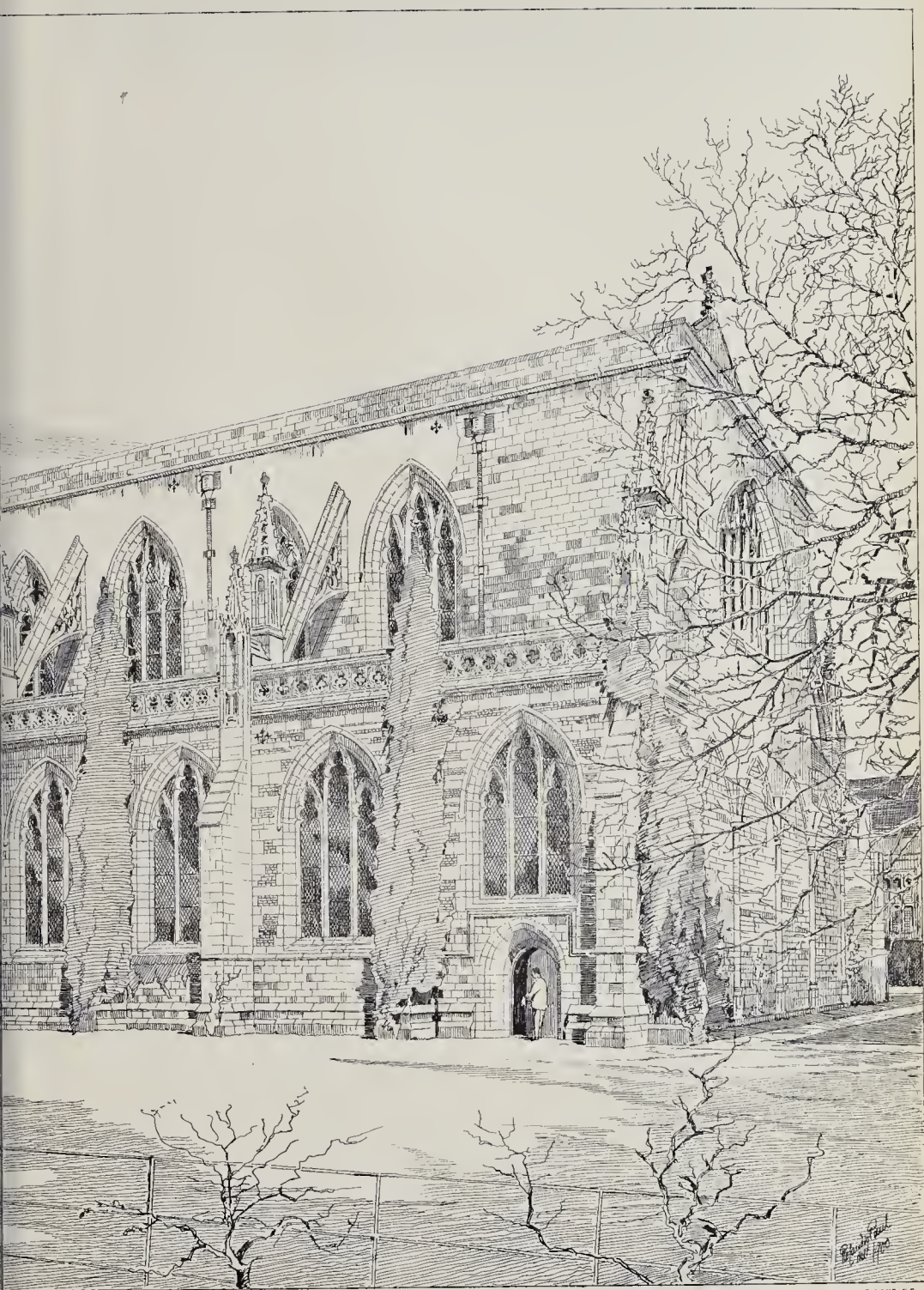
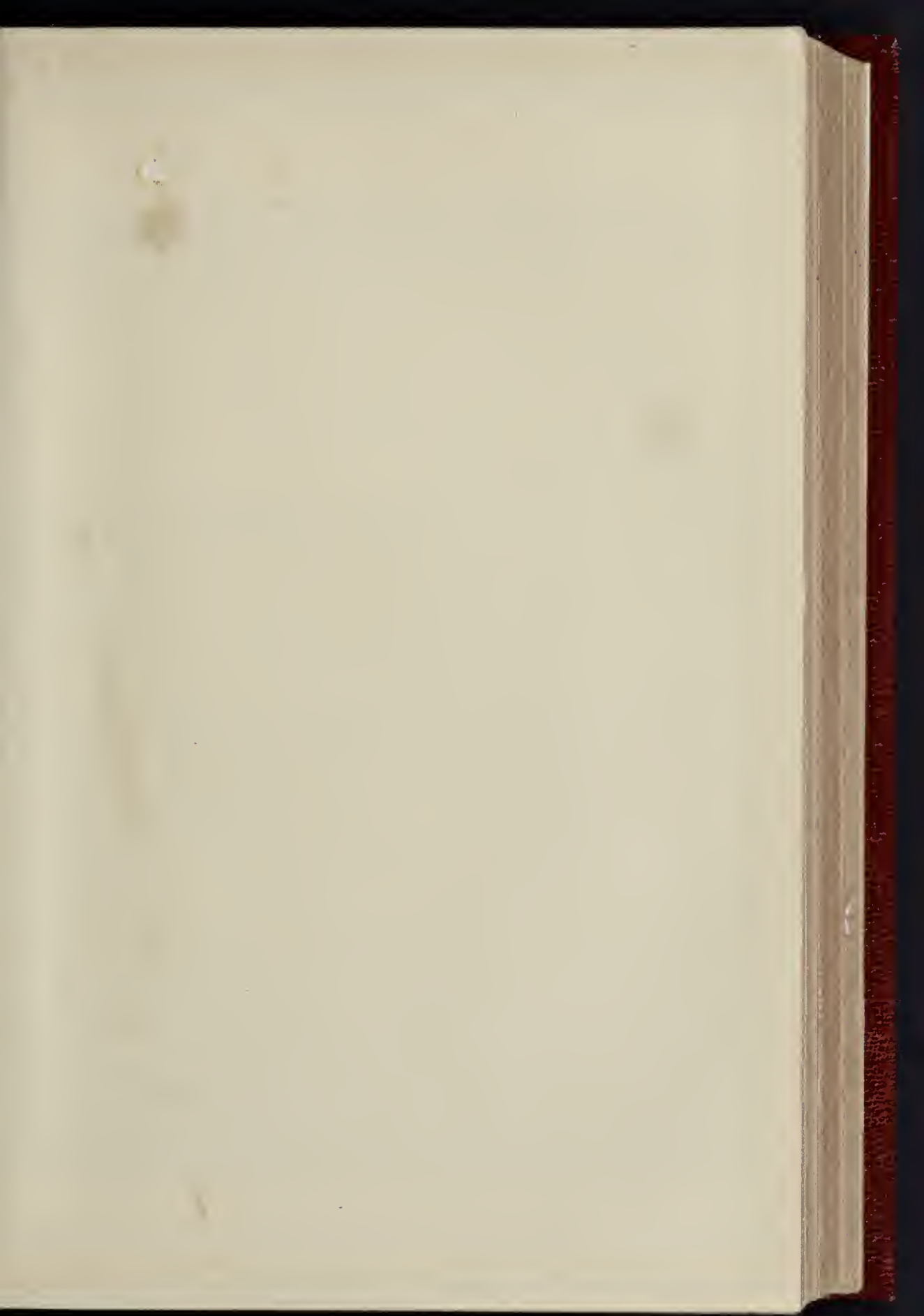


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PLATE IN. No. 36. MILTON ABBAS.
AND W. PAUL.





THE SMALLER ART PALACE ON THE CI
THE INT



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GRAND PALAIS, PARIS.—M. GIRAULT, ARCHITECT.
COURT.



The Builder.

VOL. LXXX.—No. 3293.

JANUARY 22, 1904.

ILLUSTRATIONS

Font Cover for Grantham Parish Church.—Mr. W. J. Tapper, A.R.I.B.A., Architect	Double Page Ink-Photo.
New Church of St. Mark, Plumstead: with Institute, Parish Hall and Parsonage.—Mr. Charles H. M. Mileham, Architect	Double Page Ink-Photo.
Warwick Chantry, Tewkesbury Abbey.—Measured and Drawn by Mr. Kotaro Sakurai	Double Page and two Single Page Photo-Lithos.

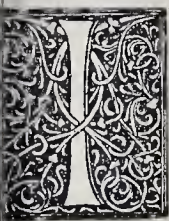
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Westminster, Old and New: 1801-1901.— Westminster before Victoria-street. (From Harwood's Map, 1755-99) Page 34	Westminster, Old and New: 1801-1901.— Milton's House in Petty France, Westminster. (Now pulled down).. Page 36
Caxton's House in the Almonry at Westminster, which fell down in 1845	St. Mark's, Plumstead. Sketch and Plan
.. 35	Illustrations to Student's Column
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Burlington House and the New Gallery.



Arranging an exhibition of the works of "British artists deceased since 1850," the Royal Academy have made one of the most interesting collections of pictures which could well have been got together.

Many of the principal works exhibited are so valuable enough to the present day to be still as fresh in the memory of many of us, and yet have not been publicly exhibited for so long that a sight of them again is welcome. Other really fine works there are owing to names of painters who never deserve that degree of impression on the public mind which their talents would have justified; painters whose style and whose subjects made little appeal to the popular taste, whose names are almost forgotten now except by a few persons, but whose re-exhibited works show how little they deserve to be forgotten. Among these Paul Falconer Poole, the painter of poetic landscapes in which more is meant than meets the eye; landscapes stimulating to the imagination, suggesting something beyond mere landscape-painting. He is represented here by two of his best pictures: one now called "The Seventh Day of Decameron," but which we first knew, many years ago, under the title "The Song Philomena on the Shores of the Beautiful Lake," is a kind of dream landscape, in which the figures are not Boccaccio's—they are not the costume or the manner of his day, but are idealised into harmony with the landscape. The other and more powerful work, "A Lion in the Path," hangs exactly where it was hung, we know not how many years ago, when it was first exhibited at the annual Academy; lurid and threatening landscape in the

foreground of which is a man pausing at the sight of a lion in the shadow of the trees before him; after Poole's manner, the landscape seems to express the terror of the incident. It is a pity that Poole's perhaps still finer work, "The Dragon's Cave," we believe the last which he exhibited at the Academy, was not added to the collection. Another half-forgotten name which is brought up again here is that of Sir William Boxall, most refined of portrait-painters of his day, so sensitive and so hard to please that he could hardly endure the sight of his own works after they were completed; yet even he, his own severest critic, might have been satisfied with the dignity and refinement of style realised in his portrait of the late Mr. Frederick Huth.

A few pictures there are which serve to recall reputations that are *passé*; it was kind to include them, perhaps, but their appeal to us is in vain now. We will not altogether class Sir John Gilbert among these; there is always a vigour of action and power of composition in his productions which make them effective in spite of their sameness of style and superficiality of conception; but surely ten of his pictures is a larger proportion than was required on an occasion of this kind. Perhaps they are more easy of acquirement than some others, and have not been lent so much. His large picture of Henry and Wolsey, "Ego et Rex Meus," belonging to the Corporation of London, is a fine work, but the head of the Cardinal does not give the idea of the dangerous and subtle character of the actual man. In some other cases we are surprised to find how much more finely and learnedly this or that man painted than we have been accustomed to think. C. R. Leslie, for instance, it has become the fashion to think of as a man over-rated in his day; perhaps he was in some respects; but look at the foreshortened head of the infant in his small picture called "Mother and Child" in Gallery I.; it is a masterpiece of delicate and conscientious execution; indeed, in the present day of "broad" effects it is rarely that we see a foreshortened head painted with such care as this; it is a bit of

work to which students should give their attention.

Where the earlier painters of the half-century most especially failed (and one or two of the later ones also) was in colour. Poor E. M. Ward, who was really a historical painter of much thought and dramatic power, and who was so harshly treated by the critics in his latter days that it drove him to suicide, was one of the prominent failures in this respect; MacIise was another; indeed in both cases it was not so much failure as a totally ignoring of the quality of colour. Ward's large work, "The Last Sleep of Argyll," however, is a really pathetic and expressive picture, and one we are glad to see again. Landseer, again, seems to have been almost without the sense of colour; in his large "Stag at Bay" the animal is magnificent in force and realism, but the tone of the whole picture is painfully cold and dreary; so also with his clever portrait of himself under the title "The Connoisseurs."

In landscape there are works in the collection which serve to remind us that there was in the earlier part of the half-century something like a great style in English landscape-painting; a quality which cannot be said to exist now. There was Turner of course—a school in himself; but we see the quality in some of the smaller works in this exhibition, such as David Cox's "Going to the Plough," and Linnell's "Landscape," both in Gallery II. Turner's "Venice," one of his later works, is exceedingly like a fulfilment in painting of Shelley's description or poetic paraphrase of Venice in his "Lines written among the Euganean Hills"; the whole thing a kind of uncertain vision of light and colour, in which we cannot tell very well where the water and reflections end and the buildings begin. It is curious, though, as an example of Turner's certainty of touch, how the apparently formless loading of white pigment on domes and other features in strong light, results in conveying the impression of architectural solidity and of the glitter of architectural detail; curious, too, to compare with such a picture Holland's solid and powerfully-

built but comparatively matter-of-fact pictures of Venetian architecture, of which there are two or three in the collection.

If we have lost for the present the sense of great style in landscape painting, however, we may be consoled by thinking of what we have gained in sea-painting. It is almost amusing (or pathetic) to look at Cooke's "Goodwin Sands" in Gallery III., and to think that the author of this was once one of our leading sea-painters. We have got beyond that, at all events. It must be confessed, too, that Turner's sea, in "The Minotaur" is just as bad, so far as any resemblance to sea goes; it is only less commonplace because it does not attempt a stage realism, but is an idealised sea, evolved from Turner's inner consciousness; whereas Cooke's is really a kind of stage imitation of sea. And yet Cooke, we believe, lived much on the sea and professed to paint what he saw! Was it that people really saw differently in those days, or was it that the power of representing sea was not developed?

Mason is largely represented; indeed, most of his best works are here—the "Harvest Moon," the "Evening Hymn," the "Pastoral Symphony," &c. It is interesting to see in the first room the "Harvest Moon" hung opposite to Walker's "Bathers"; two very opposite treatments of rustic life, which may be called the real and the ideal, though in fact Walker's centre-group is somewhat idealised; he could hardly have found two such Greek-like figures among lower-class youths in a riverside bathing party, any more than he would have found among real rustics such a *spiritual* figure as that which leans over the plough-tail, in the grand picture of "Ploughing" (which is also here), or such a figure of a labourer as that in front of "The Old Gate." Walker intended his figures to be typical of the best qualities of a class, or his instinct led him to paint them so (for he never theorised about his art); but Mason's "Harvest Moon" personages are mere creatures of a rural romance, and on the whole less interesting, on that account, than Walker's more human though somewhat idealised types.

Turner's "Conway Castle" reminds us of another change in landscape-painting, and that if we have lost the great style we have gained immensely in what is called "local colour," a matter in which Turner will often hardly bear criticism from the modern point of view; see the colour of his shore and foreground generally in this picture. Possibly it is in part through too much attention to local colour that modern English landscape-painters have lost that breadth of style which characterised Turner, Constable, Muller, Crome, and others of past days. Among the most beautiful landscapes in the exhibition are Alfred Hunt's "A Mountain Joyous with Leaves and Streams," and his exquisite "Time and Tide," a view of sea and sunset, one of the most perfect of modern landscapes in conveying the feeling of a scene. We have Millais' fine landscape-painting, too "Winter Fuel," not poetical certainly, but masterly in its way. Millais is not largely represented in proportion to his importance, because it was desired not to repeat pictures which had been already recently seen in the collective exhibition of his works. The most striking picture by him is one which we do not remember, a three-quarter length of a

brunette little girl in a yellow dress, under the title "Pensive"; a beautiful piece of colour. Among other works of special interest is Albert Moore's "The Quartet," originally called "A painter's tribute to the Art of Music," and one of the most perfect works he ever painted; much superior in colour and vigour of style to the larger and more elaborate but sentimental "Summer Night." Mrs. H. T. Wells is represented by several works, the only one of which that is at all striking is the sad little idyll, "No Joy the Blowing Season Gives," which is fine and pathetic. Owners of pictures by George Lewis have lent them liberally, and those who delight in fine painting of architectural detail and decorative accessories could find nothing better of the kind than in "The Commentator on the Koran."

But why, may we ask, in giving a representative exhibition of works by British artists who have died within the half-century, were the sculptors entirely omitted? Was it that sculpture is not popular, or have the Academicians a lurking feeling that British sculpture, till within the last twenty years, was better left without illustration? At all events in that case the title of the exhibition should have been "British Painters," not "British Artists." But it seems to be an *idée fixe* [with the Royal Academy that "art" means "painting."

The New Gallery shows a collective exhibition of the works of Sir William Richmond, who certainly has a claim to this dangerous honour, a modern ordeal from which Millais alone, to our thinking, came out leaving in the minds of the spectators an even higher opinion of his powers than they had gained from the study of his works in a more isolated manner. Sir W. Richmond, however, may be glad of an opportunity to show how varied his work has been—more varied than is perhaps generally realised; for we have here classic and legendary paintings, portraits, decorative work, and a number of small but very interesting landscape sketches and studies. Some of the classical pictures no doubt owe something of their inspiration both to Leighton and to Burne-Jones. Sir W. Richmond's own special treatment of classic legend is probably best illustrated in such works as "The Bath of Venus" in the West Gallery and the "Birth of Venus" in the North Gallery; pictures with a special scheme of colour, and in which the nude figure is treated in an abstract, severe, and half-decorative manner. "Hermes" and "Icarus" are however, admirable conceptions, though they make us think of Leighton, and would hardly have been painted but for the pre-existence of that artist. Among the numerous portraits are some which are admirable just as characteristic likenesses—those of Browning and Mr. Andrew Lang, for instance; others which have a remarkable character of sumptuous magnificence, such as that of Lady Bell, seated with one arm out in a grand attitude recalling Reynolds's Mrs. Siddons; and that of the Earl of Pembroke, a typical portrait for a nobleman with a long line of ancestry. The large cartoons for the mosaic at St. Paul's cannot be very fairly estimated in these comparatively limited spaces; they are too near the eye for their intended effect at the proper distance to be realised. The small studies and sketches in the Balcony, for St. Paul's decoration, and for

various pictures, are most interesting; and we would also specially mention the drawing for the treatment of one of the St. Paul's windows, in the South Gallery. Among the sketches of buildings and scenery are many architectural sketches of great interest, and giving admirably the character of the architecture. Everywhere there is to be seen complete command of draughtsmanship, whether in highly-finished portraits and groups or in slight sketches of figures and landscape. The whole collection is a remarkable testimony not only to the versatility but to the conscientious industry of the artist. Such a life's work goeth not forth but by labour and devotion.

THE HOLBORN TO STRAND IMPROVEMENT SCHEME.

By Mr. J. S. GIBSON, A.R.I.B.A.



It may be possible to influence the London County Council to take a worthy view of the greatest architectural scheme that is likely to come before it during our lifetime, I would briefly review the action taken by the Council, and that of the architects invited to submit designs for the southern end of the new street.

It is generally admitted that the lines of the new street, its width and gradients, are satisfactory, and the members of the Royal Institute of British Architects may be congratulated on their suggestion for the southern crescent end having been adopted, and this manifest improvement on the lines laid down by the County Council is the first fruit of expert advice.

The next step towards obtaining a street which in architectural design would be a credit to the town, was undoubtedly to obtain designs, but here the County Council failed most completely to rise to the occasion, and that for two reasons. The first was that there was no decision on their part as to the nature of the buildings desired for the land, beyond the re-housing of a newspaper, two theatres and a restaurant, which occupy a small proportion of the ground, all else was vague and unsatisfactory. It would have been a comparatively easy thing to lay down the general lines of the accommodation required for the business premises which it was manifest to all would ultimately occupy the land. The County Council have had for years the cost of this improvement before them; these estimates must be based on a return from property the nature of which is known to their valuer, and if these figures are not so based they are misleading. Having all this information before them, the Council acted exceedingly unwisely in not setting forth in general terms the actual conditions which will govern the design of the buildings likely to be erected to meet their financial estimates.

In reference to the suggested County Hall to be shown in the centre part of the "Island" site, I do not overstate the case when I say that the prohibitive costliness of the land for this purpose must have been evident to the Council for many months previous to the invitation to submit designs, and consequently its inclusion in the invitation was certain to render the designs for a large part of the land absolutely useless. That a responsible public body should wantonly waste the time of architects in this manner seems almost incredible.

The first reason of the County Council's failure may be summarised thus: that, having all the estimates of expenditure and return before them, they failed to acquaint the architects with the information or to decide on the class of property required, and so rendered the competition abortive.

The second reason for the Council's failure was their treatment of the architects selected to compete. The intention was to ask "eight leading architects" to submit designs for the frontages, and for these designs a sum of 150*l.* each (subsequently increased to 250*l.* each) was to be payment in full, and no guarantee would be given that any of the architects would be employed in the execution of his design.

It was intended that four architects should be nominated by the Royal Institute of British Architects and four by the County Council.

Before any nominations were made, a deputation from the Royal Institute waited on the County Council and pointed out the unsatisfactory nature of the conditions, and suggested others which would commend themselves to all architects, but with no appreciable result.

In consequence of the refusal of the County Council to amend their conditions, it was found that two out of the four architects nominated by the Royal Institute declined to take part in the competition, and a request from the County Council for further nominations was met with a refusal on the part of the Royal Institute owing to the unsatisfactory conditions. The result was that six architects were nominated by the County Council and took part in the competition, besides two of those nominated by the Royal Institute.

No doubt the gentlemen selected struggled with the unsatisfactory conditions governing the designs to the best of their abilities. The attitude of the County Council in refusing to give any guarantee that the architects would be employed in the execution of their designs was fatal to their chance of obtaining good designs, and is a typical instance of how architecture is regarded by the average man, cultured or otherwise. It shows the inability to distinguish between a design on paper and the actual embodiment of that design in the ordinary building materials. Now, however much architects be tempted to become designers on paper, it is nevertheless a fact that the erection of our designs is the sole justification of our existence as architects.

But it was apparently the idea of the County Council that they could get a number of sketch designs by leading architects, and that afterwards any person of average intelligence could carry these into execution. This would probably be paralleled by their asking Mr. G. F. Watts or Mr. J. S. Sargent for a sketch design for a fresco to a small scale, and then handing the sketch over to Mr. Cimabue Brown from which to paint the fresco itself. I could imagine a public body doing such a thing, but I should find it impossible to credit it with any business capacity or artistic appreciation. The business of architects is to produce buildings, and until all public bodies or private persons are aware of that fact there will not be proper relations established between the two parties.

Having pointed out the causes of the failure of the competition, I would also point

out that the obvious course for the Council to pursue, to enable them to obtain designs from which a street might be erected that would be a thing of beauty, is to institute a new competition, in which the conditions will be the reverse of those embodied in the former one. The objections to such a course are, that it is impossible to define conditions regulating the design of the buildings until the nature of the businesses to be housed is known. This contention is, however, fallacious, in view of the fact that the majority of these premises are for ordinary business shops and flats or offices, and that in very rare instances special requirements will necessitate special treatment. It has already been pointed out to the County Council how the architect for the street frontages could be employed by the lessees of the land without extra charge to them, and any other architect employed for the buildings behind the frontage if the lessees so desire.

In proof of my contention that these buildings in the majority of cases will not require special treatment, I may point to the cases of Shaftesbury-avenue and Charing Cross-road, where the vacant land as a rule was bought up by speculators, who had no intention to do other than make a profit out of it. If a purchaser or tenant did not come along within a moderate time, the speculator proceeded to erect the usual shops and flats over without any regard to any object other than his prospective profit. The result is such a deplorable exhibition of vulgarity as make those streets a travesty of architecture, and unless some strong line of action is determined in the case of the new street it is probable the results in the latter case will be worse than the former, owing to the greater scale of the street. I am firmly convinced that if the County Council insisted on the employment of the architect for the new street frontages whose design they may select, the economy to the direct lessees of the land would be considerable, and the architectural character of the buildings would assuredly be improved thereby. That something definite must be done very soon is evidenced by the fact that the houses are now being demolished, and the rehousing of the theatres and *Morning Post*, must be a matter of considerable expedition.

I have seen it stated in several newspapers that the Gaiety Theatre is to be rebuilt from the plans and designs of Messrs. Runtz & Co. If this means that this part of the "Island" site is to be built according to the design submitted by Mr. Ernest Runtz in the recent competition, it will interfere with the unity of the general scheme, and stand in the way of the opportunity to carry through a great architectural design for the new street. The question is of such moment to London that I hope the County Council will take the best architectural advice it can obtain before giving its sanction to the design of any buildings on this land, and until it is firmly convinced of a consistent line of action which will ensure an architectural treatment of the new street of which we may all be proud.

J. S. G.

NOTES.

It is sincerely to be hoped that the Royal Commission now engaged in a consideration of the various questions connected with

the Port of London may evolve some satisfactory scheme for ameliorating the conditions at present existing. We are glad to notice that the County Purposes Committee of the Corporation has lately put forward some suggestions for the future management of the port. The committee proposes that a public trust should be constituted, including representatives of the Admiralty, the Board of Trade, the Customs, the Trinity House, Lloyd's, the chief railway companies, the Corporation, and the London County Council. This very comprehensive body, it is suggested, should be armed with the fullest possible powers for making the port in every way attractive to the shipping industry. No doubt the Royal Commission will be prepared to show in what manner this desirable aim may be attained, and if the trust were instituted without loss of time after the report of the Commission has been presented, there would be reason for believing that the utterly inadequate accommodation and antiquated methods now prevailing might speedily give place to facilities more worthy of the metropolis, and of the century in which we live.

It is understood that the third wing of the Admiralty building, the one facing to the Horse Guards' Parade, is to be commenced almost immediately, and that it is to be more ornate than the other two, and to have sculptural decoration. It is to be hoped that it will at all events be architecturally more worthy of the site and of the purpose of the building than the portions already erected. We should have thought the best policy would have been to start again *de novo*, get a really fine design made and carried out for the new wing, and then pull down the two others and rebuild them as a continuation of the new design.

In a "Note" on August 4 last year we referred to the mishap, on June 28, 1900, to one of the lifts at the London Bridge Station of the City and South London Railway. A recently-issued Board of Trade Report confirms the details which we then stated. The primary cause of the accident was the failure of a shaft that was originally believed by the makers, and we presume by the Board of Trade also, to be of ample diameter. The condition of absolute intallibility with regard to purely structural matters is, of course, practically unattainable, but the public is entitled to demand reasonable safeguards against injury in the event of breakage, whether avoidable or unavoidable. In the present case, we find the lift gear included a safety apparatus, and buffers were fitted at the bottom of the lift well, but the safety gear had been disconnected while some adjustments were being effected. Under these circumstances it is simply astounding that the lift should have been used. But a further reason for astonishment is afforded by the fact that the workmen engaged in adjusting the balance of the apparatus had placed some heavy weights in an insecure position just above the fragile roof of the cage. When the shaft broke, the cage descended at an abnormal speed, and although the friction of the ropes prevented the attainment of a velocity likely to endanger the safety of the occupants, the sudden arrest of the cage at the bottom

The Port of London.

of the well was sufficient to shake the weights from their temporary resting place, and thus to injure the lift attendant and two out of three passengers present. There is one point in connexion with this particular case to which the attention of all lift makers should be specially directed, namely:—That even if the safety apparatus had been in gear, it would not have been sprung because the ropes neither broke nor slackened. As most of the safety gears used in this country cannot come into operation unless a rope breaks or slackens, it is imperative that some improvement should be introduced without delay. One plan suggested is to add a rope passing directly from the safety clutches over the pulley at the top to the counterweight. This will bring the clutches into operation as soon as any alteration takes place in the distance between the cage and the counterweight, measuring along the course of this auxiliary rope. In our opinion, a much safer device is that in which the release of the safety gear is directly controlled by the actual velocity of the cage. Under this system any abnormal rate of speed, whatever may be the originating cause, at once results in the application of the safety clutches.

Electric Railways and Electrolysis.

In a letter in Monday's *Times* Mr. Hunter points out the dangers likely to arise from electrolysis, owing to leakage of current from the rails of the electric tramways that are being constructed all over the country. He suggests that no injustice would be caused by making and enforcing proper regulations as to return mains, and that it would be advisable to appoint a Royal Commission to consider the subject. Now there are many indications that as tramway and electric lighting systems are getting larger and larger, the stray currents from them are increasing in proportion, and that the present Board of Trade rules about leakage will have to be made even more stringent in the immediate future. A striking instance of this was mentioned by Mr. Parshall at the recent Board of Trade conference to discuss methods of preventing the working of the electric tramway between Kew and Brentford from affecting the magnetograph records at the Observatory. He said that at the present time, although the tramways were not yet working, there was sometimes a difference of pressure between the ends of the tramway rails of 0·8 of a volt. As the resistance of the rails is probably less than the hundredth of an ohm per mile, it will be seen that at certain times of the day there are several amperes of current flowing along the rails. This current must be due to leakage from some of the neighbouring electric railways, or possibly from a direct current electric lighting network. This shows that already the currents flowing in some of the water and gas mains in London are appreciable, and a keen look out should be kept for any signs of electrolytic corrosion. The Board of Trade regulation for the difference of pressure between the two ends of a rail in an electric tramway is that it must not be greater than seven volts. Hence there is not much margin for preventing leakage by making this rule more stringent. Sooner or later a remedy will have to be found, as it is evident that the country

desires electric tramways. Several have been already suggested, such as keeping the pipes negative to the rail, &c., or using an insulated return. Making an insulated return compulsory in country districts would be a pity, however, as it would make the cost practically prohibitive.

Stoves in France.

A DEMOCRATIC people is sometimes the most arbitrary, and thus it happens that the French people patiently submit to official acts which would not be tolerated in England. Of late, in Paris, numerous accidents have occurred from persons being suffocated through stoves being imperfectly connected with the chimney, or it may be not being connected at all. An order has therefore been issued by which inspectors are appointed for the purpose of seeing that the stoves of Paris are properly fixed and their fumes carried away. They have full power to enter any house for this purpose. It may be desirable that there should be this form of inspection, but can any one imagine the letters which would be written to the daily paper were smoke inspectors appointed in England with similar powers? It is to this autocratic attitude of the French officials that many structural reforms are also due. It is to be observed in connexion with this order that it seems to show that stoves, however desirable as heating apparatus, require more careful attention than patentees and salesmen will often allow. That stoves are not sufficiently used in England—if it is desired to economise fuel—is certain; at the same time, they have drawbacks which do not belong to the agreeable, if often wasteful, open fireplace.

SOME tests on the corrosion of iron and steel have lately been considered by the "Engineers' Society of Western Pennsylvania," and they were undertaken with the object of ascertaining what influence the presence of copper might have in arresting corrosion. In the first set of tests the following percentages of loss from atmospheric corrosion were found:—Bessemer steel, 1·85; Bessemer steel, with 0·263 copper, 0·74. Other specimens in this series showed the percentage of loss to be inversely proportional to the amount of copper contained in the metal. In the second set of tests, the percentages of loss were:—Bessemer steel, 1·65; wrought iron (mean), 0·81; wrought iron, with 0·393 copper, 0·53. The presence of copper in the small proportions indicated above cannot be thought likely to exercise any prejudicial effect upon the physical properties of either iron or steel, and it might readily be introduced during smelting by the employment of ore containing copper. Retardation of corrosion also follows the addition of nickel, a result evidenced by investigations, of which an account was given at the Congress of the International Association for Testing Materials of Construction. In small proportions, nickel has the further property of increasing both the elastic limit and the tensile strength of steel.

Traffic Problems in New York.

ALTHOUGH American engineers have been allowed to do pretty much as they liked in the past, it is becoming more and more evident every year that their operations will ultimately have to be conformable with regulations

very much akin to those existing in our own country. The necessity for such rules is nowhere more apparent than in connexion with traffic facilities in great cities. City railroads and tramways have hitherto, in American cities, been carried in a cheerfully promiscuous manner along the public thoroughfares or erected on stilts, as it were, above them, the chief idea being to deal with a difficulty in the way that seemed for the moment to be the most practical and convenient. In spite of the freedom permitted to engineers, it is clear that means of rapid transit are still wanted in many American cities, and notably in New York. The view that public thoroughfares present a strictly inelastic area has prevailed for many years in London. It has successively extended to Glasgow, Paris, Boston, and New York. In the last-named city, an interesting example of an underground railway, known as the "Rapid Transit Tunnel," is now in course of construction. A large proportion of the subway is being made on the cut-and-cover method, and on sections of the line where this class of work is adopted little trouble in respect of actual excavation is anticipated, but somewhat complicated problems are likely to arise when material has to be removed from below various street railway tracks. Where tunnels are driven, they will generally lie at a considerable depth, particularly below the elevated district known as Washington Heights. For a distance of over two miles, between 150th-street and 195th-street, the average depth will be 120 ft., and two stations in this section will be 100 ft. and 120 ft. respectively below the street level. Like the Paris Metropolitan Railway, the new subway will contain both the up and the down lines, and electricity will, of course, constitute the motive power. Very satisfactory progress has been made with this undertaking, which is clearly a step in the right direction.

The Walls of Avignon.

THE credit which is due to France for the care which is given to questions concerning the erection of modern buildings can scarcely be extended to the buildings of historical interest. The French spirit is essentially logical, it is not one which values the past, hence it results that old structures are demolished not only without hesitation, but sometimes almost prematurely. There is no more striking relic of mediæval France than the wall which still surrounds Avignon, with its towers and its gateways. But the ancient gateway, which faced the modern suspension bridge and so formed a main entrance to the town, has been pulled down. It was said to be in a very weak state, but be that as it may, no attempt has been made to preserve it, and a great gap has been made in the wall. Restorations, or renovations after the antique, have to be carefully carried out, but we are inclined to think that if the old gateway could not longer have been preserved it might have been rebuilt, thus keeping up the continuity of the walls. These walls themselves are not too well looked after, and seem to be decaying in many places, and to need small repairs, and the shanties which are placed in various parts against their external sides should be pulled down. Boulevards may be built, but the walls of Avignon can never be replaced; and we wish we could think that those who are responsible for their preservation realise

to the full the trust which they hold, not for
 France only, but for the whole world.

In a "Note" of January 20,
 last year, we commented upon
 the scheme propounded by the
 Corporation of London for rebuilding upon
 their "John Carpenter" estate between
 Dover-street and Tottenham Court-road.
 The leases of nearly all of the property will
 expire on Lady Day next year. The City
 Lands Committee have now prepared plans,
 which the Corporation adopt, and which,
 as we apprehended at the time, will
 quite destroy the architectural character
 of the streets on that estate, as laid
 out by George Dance, R.A., for the Cor-
 poration in the interval 1790-1814. The
 approved plans provide for the demolition
 of the North and South crescents, at the two
 ends of Alfred-place; for the extension of
 Alfred-place towards the north as far as
 Alfred-mews, and towards the south across
 Bayley-street, and so behind Bedford-square
 to the lately widened thoroughfare from
 Caroline-street into Tottenham Court-road;
 and for the replacement of Alfred-mews
 with a new street, to be 50 ft. in width.
 In the report which accompanies the plans
 the City Lands Committee express their
 opinion that Dance's planning of the two
 crescents, with cross thoroughfares (Chenies
 and Store streets), at the open ends of the
 wide road upon the axis between their
 centres is quite out of date, and is to be
 deprecated for many reasons. We should
 like to know what these reasons are.

It is stated that the trustees
 have finally closed this school.
 in pursuance of an order to
 that intent made by the Charity Commis-
 sioners, and that the site will be disposed of,
 on behalf of the trust, for purposes of the
 proposed West London Polytechnic Insti-
 tute. The school endowment was estab-
 lished under an Act of Parliament passed
 for administering the estate of Sir William
 Godolphin, our Ambassador to Spain,
cap. Charles II., whose testamentary dis-
 positions were in that respect regulated by
 two schemes in Chancery in 1852 and 1859.
 The school, remodelled accordingly as a
 grammar school, was opened in August,
 1862, in the present buildings erected upon
 a site of nearly four acres, adjoining St.
 John's Church (Butterfield, 1860), in Dart-
 mouth-road, after C. H. Cooke's plans and
 designs, which are described and illustrated
 in our columns of August 10, 1861. The
 buildings comprise a schoolroom for 200
 boys, class-rooms, dining-hall, dormitories for
 forty boarders, and headmaster's residence.

On December 16 the final ser-
 vices were held in this chapel,
 and after a subsequent valedic-
 tory meeting of the congregation the
 chapel has been finally closed. The sites of
 the building and three adjoining houses have
 been taken for the local street improvements
 about to be carried out by the London
 County Council, who, we gather, will allot,
 in compensation, a fresh site on the line of
 the new road, High Holborn to the Strand,
 for headquarters with a church-house of the
 Baptist Union of Great Britain and Ireland.
 The chapel in Kingsgate-street was originally
 founded in 1735; the present building was

erected in 1855-6, after C. C. Searle's plans
 and designs.

This winter's exhibition of the
 Society of Oil Painters, at the
 Dudley Gallery, contains a good
 many interesting works, among them the last
 production of the late Mr. Wimperis, "Stan-
 pit Common" (112), a large work showing
 this artist's usual fine qualities as a water-
 colour artist of the old school. The new
 President, Mr. Frank Walton, is represented
 by a fine and carefully-finished landscape,
 "Holmbury Gorse" (276), not, it must be
 admitted, in the highest style of water-colour
 art, but a very charming work of its type;
 in regard to style, we prefer the smaller
 drawing, "Upfolds" (278). Among the pic-
 tures in which figures form a prominent
 element is Mr. Fulleylove's "Montpellier"
 (262), a kind of restoration of the terrace with
 eighteenth-century figures; possibly the young
 man in the foreground is meant for Rousseau,
 who tells us in his "Confessions" how he
 was warned against the fascinations of the
 Montpellier beauties. Mr. Dollman's "Fox
 and Pheasant" (256) is a clever picture of a
 hunting man and a shooting man, in approp-
 riately costumes, apparently discussing the
 merits of their respective sports. In a higher
 vein is Mr. Wardle's "The Flute of Pan"
 (209), where panthers and poppies combine
 to make a fine piece of imaginative colouring.
 Mr. F. D. Millet's "The Fireside"
 (165) is an interior with a figure painted
 in his best style. Otherwise the figure
 pictures are not generally the principal
 interest in the exhibition. Among land-
 scapes which may be singled out as of
 special interest are M. Fantin-Latour's
 "La Nuit" (169); Mr. Austen Brown's
 "Burning Weeds" (247); Mr. Julius Oisson's
 sea pictures, especially "Study of Rough
 Sea" (40); Mr. John White's "Evening at
 the Well" (70), a village street scene in a
 quiet evening light; Mr. R. W. Allan's
 "Honfleur Fishing-Boats" (150); Mr.
 Thorne Waite's "Evening Light" (308), and
 Mr. Alfred Hartley's "Water Nymphs" (468),
 which takes its name from some small
 figures of bathers, which add a little inci-
 dent to a beautifully composed landscape.

PROFESSOR AITCHISON'S Lec-
 tures on Architecture at the
 Royal Academy, which will
 commence on the 28th, deal entirely with
 the subject of St. Peter's. A set of lectures
 from Professor Aitchison on such a subject
 is sure to be of exceptional interest.

A CORRESPONDENT signing him-
 self "Engineer" makes an ex-
 cellent proposal in the *Times*
 for preserving the stones at Stonehenge
 from being any further overturned by storm.
 The object of course is to effect this without
 destroying the ancient appearance of the monu-
 ment. "Engineer" proposes to cut a trench
 of about a foot wide against one stone,
 excavated to the level of the bottom of the
 stone, and carrying it outwards to a length
 of 6 ft. or so at right angles with the side of
 the stone. Then fill this trench with con-
 crete, and make a similar one alongside the
 first, and so on until the foot of the stone is
 bedded in a mass of concrete; the turf
 to be then replaced over the concrete,
 so that no sign of the work would
 appear. We would suggest, however, that
 an improvement on "Engineer's" scheme

would be to have these trenches only at inter-
 vals, or two against each of the larger sides
 and one against each of the shorter sides of
 the stone; these would act as buttresses, as
 effectually as the complete mass of concrete,
 and would disturb the ground less and
 require less labour and material.

THE small and select exhibition
 of a few landscape-painters at
 the Dudley Gallery—Messrs.
 R. W. Allan, Aumonier, J. S. Hill, A. D.
 Peppercorn, Leslie Thomson, and E. A.
 Waterlow—again comes round as a pleasant
 event in the artistic world; an exhibition in
 which we can concentrate attention on a small
 number of thoughtful landscape-paintings,
 undistracted by the crowd of an ordinary mul-
 ti-farious exhibition. Mr. Waterlow, who comes
 first in the order of hanging, with a less distinc-
 tive individuality than one or two others of
 the group, is always complete and satisfying
 in his treatment of landscape, more espe-
 cially in the largest work exhibited here,
 "A Hill Farm, Provence," a landscape quite
 perfect in style. Of the others, "A Mill on
 the Ouse" (a mill we know well), and
 "Walberswick Church," are the most
 interesting. Mr. Allan shows his most
 typical qualities in "Cullen Harbour,"
 but surprises us by a grand and bold view of
 "A Gate of the Sea"; a sea-shore gorge
 between two vast cliffs, at the end of which
 the waves are just discerned breaking on the
 beach. The "Falls of Clyde" is rather
 heavy; "Portknockie" is a fine little harbour
 scene. Mr. Aumonier's largest picture, "A
 Cambridgeshire Farm," looks a little cold
 and ragged; the most taking of his pictures
 are "Evening" and "The Strayed Flock."
 Mr. Leslie Thomson's "Peaceful Summer"
 has a broad calm about it which quite answers
 to the title; his most powerful work is
 "After Thunder," where he has succeeded
 in conveying the effect of the glitter of white
 cliffs and other objects as the thunder-cloud
 clears off behind them. Mr. Peppercorn is
 not quite at his best; "A Sedgy Pool" has
 the materials of a fine picture, but the trees
 are too defiantly ragged in execution; the
 best of his set are "The Edge of the Moor"
 and the little bright sketch (on a Surrey
 road?) called "The Hay Cart." Mr. Hill's
 best things are really his flower-pieces—still
 life—hardly in place in a landscape exhi-
 bition; he experiments a little too much in
 landscape; his "Night" is fine, however,
 but (as usual in such pictures) not really
 dark enough for night.

THE PROPOSED NEW STREETS IN CENTRAL
 MANCHESTER.—A Bill to authorise the construction
 of new streets and other improvements in the
 neighbourhood of Market-street, Manchester, has
 just been deposited for next Session on behalf
 of certain persons named in the Bill, who seek to be
 incorporated under the name of the Manchester
 (Market-street Area) Improvements Company.
 The preamble sets out that great local and public
 advantage would follow the making of two new
 streets, the one to run from the corner of Market-
 street and Corporation-street to the corner of New
 Brown-street and Cannon-street, and the other to
 run from the corner of Market-street and New
 Brown-street to the corner of Corporation-street
 and Cannon-street, affording in the one case a more
 direct road from Shudehill Market to Victoria
 Station, and in the other a more direct road from
 the home-trade warehouses and Shudehill Market to
 the Manchester Exchange. The preamble further
 recites that the buildings on the lands adjoining the
 proposed new streets are for the most part very old,
 and their removal and the erection of new buildings
 thereon would be a public advantage. To effect
 these improvements it is proposed to establish a
 company with a share capital of 1,000,000l.,
 divided into 100,000 shares of 10l. each, and with
 the right to borrow on mortgage a further sum of
 500,000l. The new streets are to be completed
 within four years from the passing of the Act.

Alfred-place,
 Bloomsbury.

Society of
 Oil Painters.

Landscape Exhi-
 bition, Dudley
 Gallery.

Godolphin
 School.

Godolphin,
 our Ambassador to Spain,

Professor
 Aitchison's
 Lectures.

The Preservation
 of Stonehenge.

Kingsgate-street
 Chapel.

WESTMINSTER, OLD AND NEW: 1801-1900.

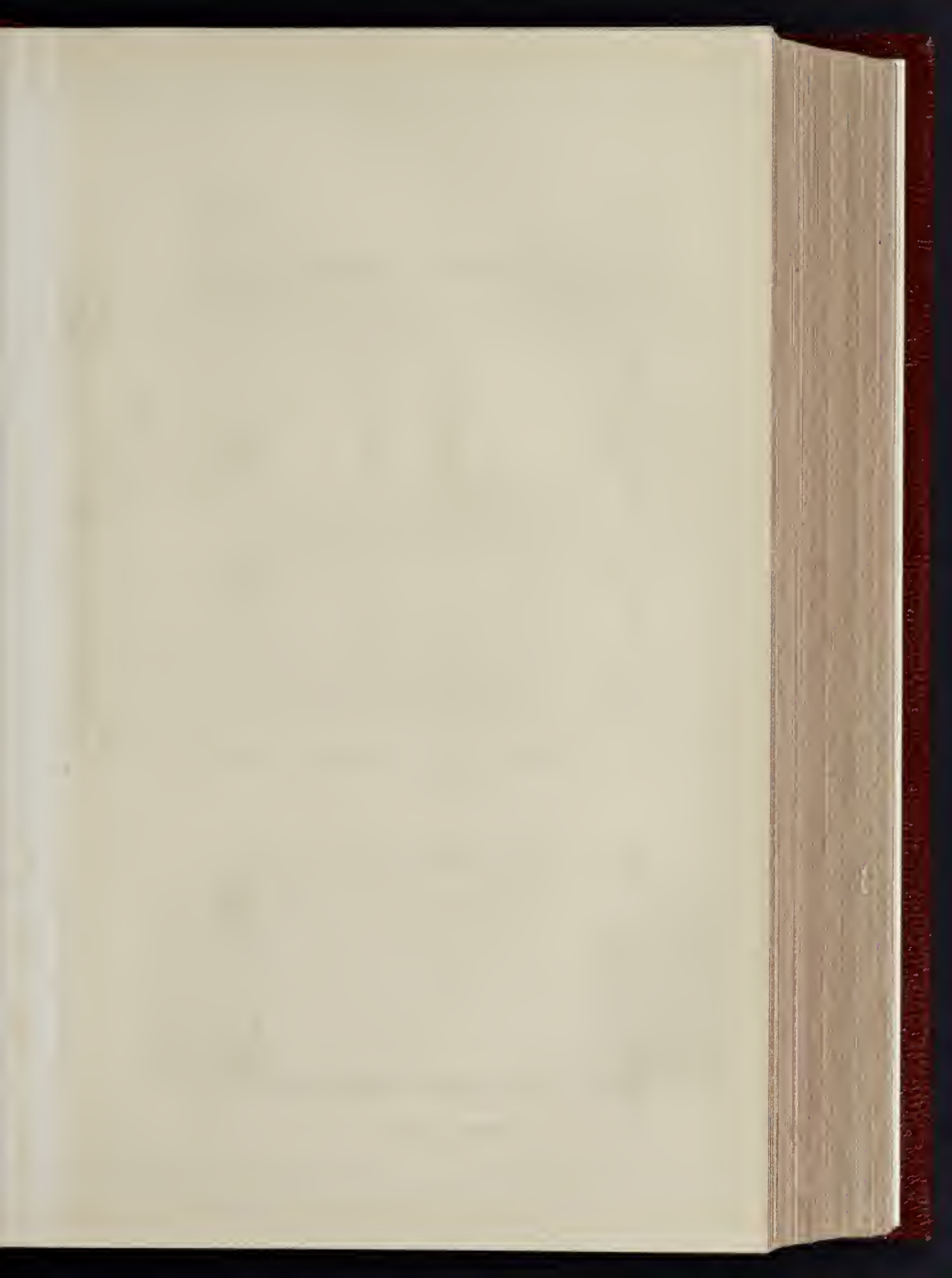
(Continued from page 13.)

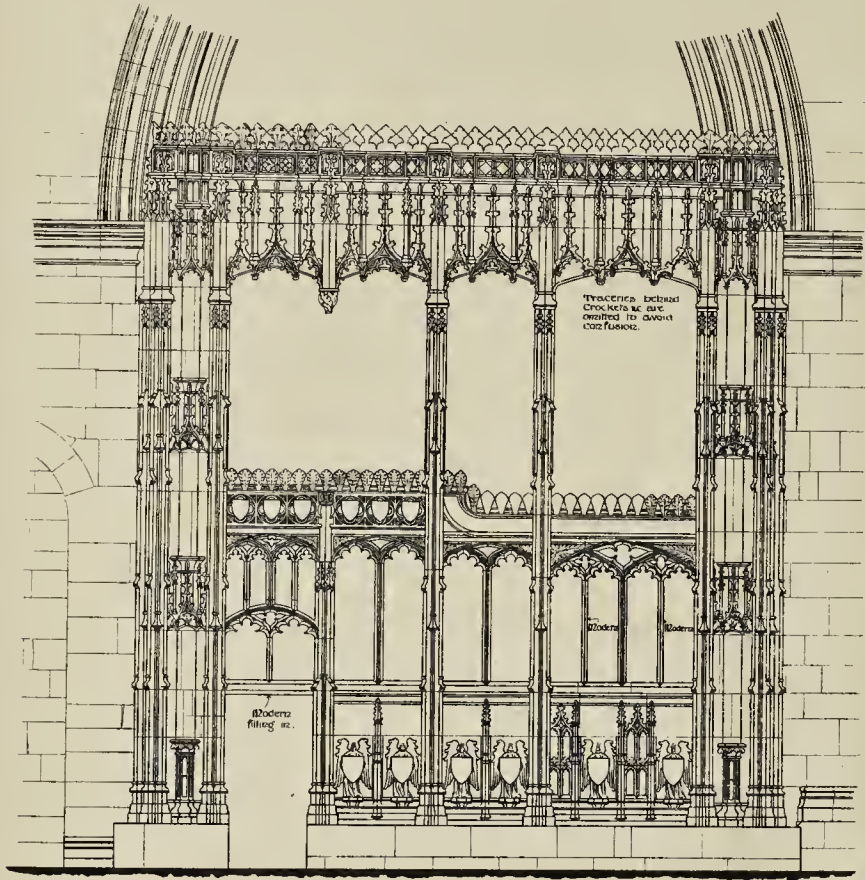
VICTORIA-STREET. — Whilst the making of a new street from the Abbey to the Chelsea Waterworks basin at Pimlico was foreshadowed in Gwyn's "London and Westminster Improved," 1766, the formation of New Westminster may be said to practically begin with the appointment in 1845 of the Westminster Improvement Commission in terms of the Acts in that behalf of 1845-7. In 1845 various plans were submitted by Tarring, Donthorn, Lapidge, Lewer, S. Smirke, Bardwell, H. H. Russell, Abraham, and others, and "notices" were served on owners and tenants on September 27 of that year. The Commissioners laid out a slightly-curved thoroughfare 80 ft. wide, about 5 furlongs in length, and with frontages from 60 ft. to 70 ft. deep, from Broad Sanctuary to Shaftesbury-terrace, Pimlico, passing through the Almonry, Dean, Orchard, New and Old Pye-streets, to Strutton (Stourton) ground, through the burial ground at the New Chapel, and so across Brewer's-green, the artillery ground, and past the White Hart, or Elliott's, now Watney, Combe, Reid & Co.'s brewery, to a point opposite the later Victoria railway station. The street was opened on August 6, 1851. Building operations began at the south end. It is said that Mr. Elliott received 22,000l., at the rate of 4,000l. per acre, for the meadow fronting his brewery. In Broadway, on the line of route, is Christ Church (Ambrose Poynter, 1842-3, the glass by Willement) on the site of the New Chapel built in 1626 as a chapel-of-ease to St. Margaret's. Fig. 4, from Horwood's plan, gives the plan of the streets before Victoria-street was begun.

The new frontages were not acquired as quickly as was expected. Amongst the earliest buildings were Henry Clutton's Training Schools for the National Society, begun in 1852, and some blocks of flats at the southern end by Mackenzie [December 3, 1853] and by Ashton. E. Bassett Keeling (obit 1886) designed Prince's Mansions. On the site of the Black Coat School and Palmer's Almshouses with their chapel and school, founded in Tothill-side 1654, was built the "Army and Navy," renamed the "Windsor" Hotel (Thomas Pilkington, obit 1898), at a cost of 80,000l. Another conspicuous hotel is the "Westminster Palace," 1858-61 (Andrew and William Moseley), at the west end of whose Tothill-street front stood Caxton's reputed house (the "Reed Pale") in the Almonry (fig. 5), which fell down in November, 1845. Alexandra mansions, and Members'-buildings, 1878-9, are by Mr. Francis Butler. Beyond Palmer's-passageway, now Palmer-street, between the Peabody-buildings and the Windsor Hotel stood Nicholas Butler's Almshouses (1675). The Palmer and Butler Charities have been re-settled in Rochester-row. Abbey-mansions at the corner of Orchard-street were built by Mr. W. Rickard, contractor, at a cost of 95,000l., after Mr.

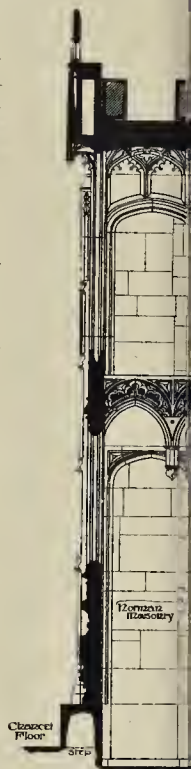


Fig. 4.—Westminster before Victoria-street. (From Horwood's Map, 1795-99.)

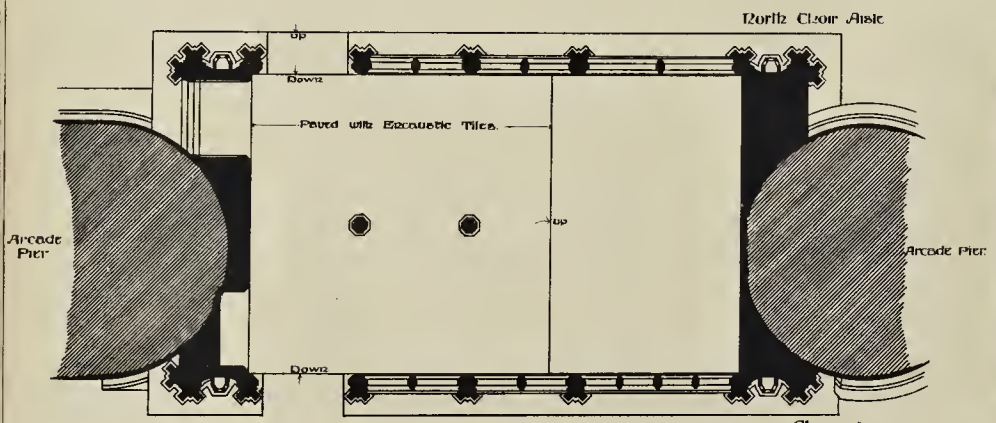




Elevation



Cross

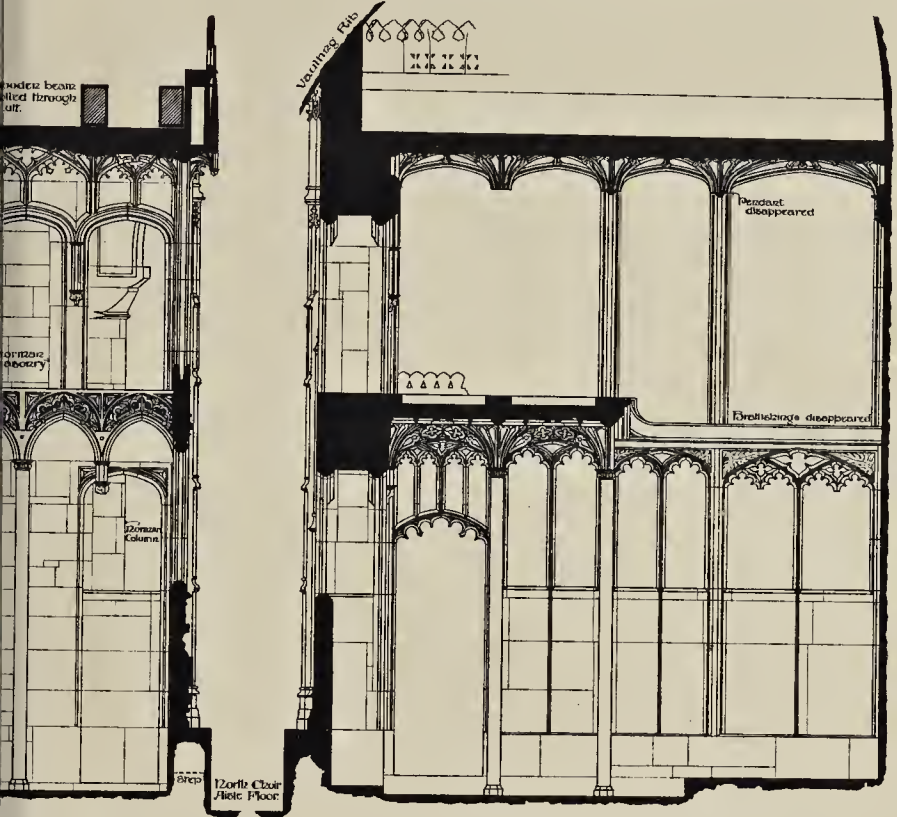


Ground Plan

Lower

Scale of 1 2 3 4 5 6 7 8

WARWICK CHNTRY, TEWKESBURY ABBEY.

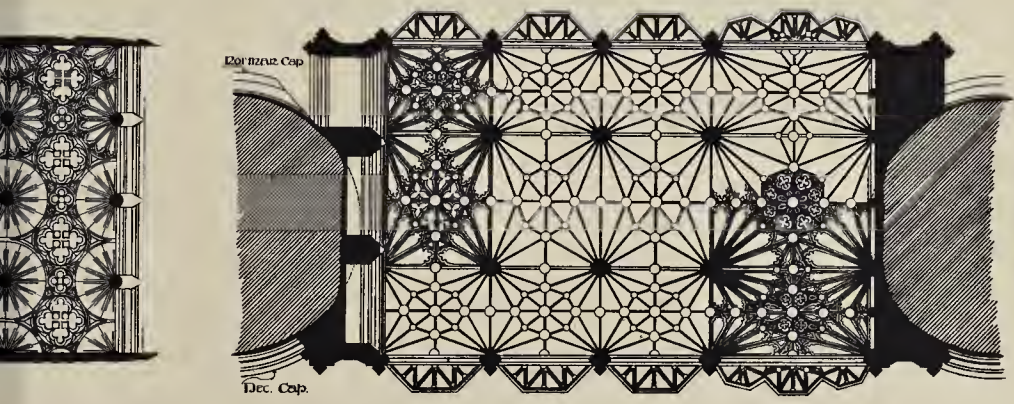


Section

Longitudinal Section

DESCRIPTION
 of the chantry
 monument of Isabelle
 le Despenser, Comtesse
 de Warwick, que l'avez
 Capelle fondue en
 l'abbaye de Tewkesbury
 et est l'abbaye apud
 Warwick le 22^e jour
 de Sepbre l'an 1399.
 Et sepulta e. i. choro i
 dextra patris sui: cuj
 ante pariet dicitur.

Note - There is trace
 of colour decoration &
 painting in whole place.



Vaulting Plan

Upper Vaulting Plan

0 15 30 Feet.

Measured & Drawn by
 Norman Jackson
 March & April 1891



Fig. 5.—Caxton's House in the Almshouse at Westminster, which fell down in 1845.

in pitch (the dormers remain on the north side) and the dome of the great drawing-room flattened down, 1848, for the present top floor; alterations, including the "Scott" memorial library, 1883-5, by Mr. Bodley, for Westminster School; rebuilding, 1883, of the late Mr. Turle's house, *temp.* Henry VIII., on the site of the convent privy dorter or necessarium; "Rigaud's" boarding-house, rebuilt for Westminster School, 1897—Mr. T. G. Jackson. *Delahay-street*: No. 2, St. James's Lodge, on the site of Duke-street Chapel, which in 1769 was made out of the north wing of Judge Jeffreys' house; Nos. 7 and 9, being the front and south wings of the house built for Jeffreys, pulled down in October, 1832, and rebuilt after Messrs. Ernest George & Peto's designs; the State Paper Office, 1829-33, by Sir John Soane, pulled down, 1862, for Sir G. G. Scott's Foreign Office; Nos. 13 and 17—Messrs. Isaacs & Florence; No. 19—W. Butterfield. *Great George-street*: Houses at corner with Delahay-street—Henry Wyatt; No. 12, Surveyors Institution, 1807-8—Messrs. A. Waterhouse & Son [April 1, 1869]; No. 8, in 1884—W. Halsey Kearsley [October 10, 1898]; the Institution of Civil Engineers, on the sites of Nos. 24-5 (original Institution) and 26, in 1894-5—Charles Barry, *ob.* June 2, 1900, the portrait busts by Mr. H. C. Fehr, Messrs. Mowlem's contract for 41,000l. [June 22, 1895]. *Storey's-gate*: Institute of Mechanical Engineers, opened on February 9, 1899—Mr. Basil Slade [June 3, 1899]; block of flats, 1896-7—Mr. Basil Slade. *Dartmouth-street*: Universities Mission to Central Africa, with chapel—Mr. G. C. Horsley [September 10, 1896]; and House of the Society of St. John the Evangelist, the Cowley Fathers—Mr. Henry Watson. House in *Queen-square*, for Sir Charles Forster—T. H. Wyatt (1807-1880). *Totbill-street*: The "Cock," the traditional pay-table of workmen at the Abbey, *temp.* Henry III., demolished in 1845 (see Archer's "Vestiges of Old London"). *King-street*, and the west side of *Parliament-street*, pulled down, 1896-1900, for the new Government Offices—Mr. J. M. Brydon [March 25, 1899, and May 5, 1900]. *Parliament-street*: Nos. 52-3—Mr. H. Huntly Gordon [November 21, 1896, two]; No. 54, Grindlay & Co.'s bank, 1898—Mr. Alfred Williams [December 16, 1899]; No. 48, the "Red Lion," 1899—Messrs. Gardiner & Theobald. H.M.'s Stationery Office, *Princes-street*, 1853-4, by Sir James Pennethorne, on the site of the Guards' Store and Royal Westminster Mews—Decimus Burton, *ob.* 1881. *York-street*: Milton's, and afterwards Hazlett's house, No. 10, pulled down in 1877 for Mr. Harkney's mansions; M. D. Ry, Co.'s offices, St. James's Park Station, 1898—Mr. H. L. Florence, Messrs. Cubitt & Co.'s contract, 15,416l.; Wellington-chambers, 1899—Mr. G. Simpson. St. Ermin's mansions, *Caxton-street*—Mr. E. T. Hall [June 25, 1887]. *Vincent-square*: St. Mary's Church, 1837—E. Blore; Grosvenor Hospital for Women and Children, 1897-8—Messrs. Roumieu & Aitchison as honorary architects for the hospital and out-patients department.

Victoria-street: At the south-end, the Clock Tower, 1892—Messrs. Gillett & Johnson. St. Matthew's Mission House—E. Ayton-Lee (1846-90). St. Matthew's Church, *Great Peter-street*, begun in 1840—Sir G. G. Scott. *Great Smith-street*: Free Public Library—Mr. Francis J. Smith, Messrs. Stimpson & Son's tender, 7,350l., accepted in August, 1891; Baths and Washhouses—Mr. Francis J. Smith, Messrs. Stimpson & Son's tender, 18,800l., accepted in August, 1891; enlargement of Queen Anne's Bounty Office, 1899-1900—H. Currey and Mr. Percival Currey. Police-station, *Rochester-row*, 1900—Mr. J. Dixon Butler. *Greycoat-place*: Army and Navy Co-operative Society's buildings, 1899—Mr. R. T. Blomfield. Westminster Palace-gardens, *Artillery-row*, 1898-9—Mr. A. Blackford. Residential flats on west side of *Emery Hill-street*, and south-east side of *Francis-street*, 1900—Mr. E. J. Stubbs. Blocks of flats on the north-east side of *Carlisle-place*, and two blocks on the north side of *Francis-street*, between *Carlisle-place* and *Morpeth-terrace*, 1897-8—Mr. G. Baines. Army and Navy Mansions, corner of *Victoria-street* and *Francis-street* [May 7, 1898]—Mr. C. J. C. Pawley, built by Mr. W. Goodwin, 40,000l. *Horseferry-road*: Coroner's court, public mortuary, &c., 1893—Mr. G. R. Wheeler, Surveyor to the Vestry; workshops for Messrs. Broadwood, 1856—Francis Edwards, *ob.* 1857; Wesleyan Normal Training College Model School, 1849-50—James Wilson [December 21, 1850].

Chapter and Regency streets: Drill-hall and headquarters of the Electrical Engineers' Volunteer Corps, 1900—Mr. W. C. Waymouth.

Orchard-street: Offices and warehouse, 1898—Mr. G. H. Biphick. Rebuilding on the sites of Nos. 10-3, *Little College-street* and Nos. 6-8, *Cowley-street*, 1899-1900—Mr. F. A. Smith.

North of Victoria-street—Westminster enjoys a full share of eleemosynary and educational endowments. One of the more important was Emmanuel Hospital, in James-street (formerly Buckingham-row, and since renamed Buckingham-gate), founded by Anne, widow of George Fienes, tenth Lord Dacre of the South, who died *s.p.* September 25, 1501. The Baroness directed her executors to build near to her own home, Stourton House, in Tothill-fields, "a

J. C. Pawley's plans and designs [May 7, 1898], for Government offices. Our comments upon the disaster whereby seven men met with their death and others with serious injury through the collapse of the concrete roof, and a full report of Mr. Justice Grantham's summing up for the defendant in Regina v. Pawley will be found in the *Builder* of May 28 and July 2, 1898.

South of Victoria-street.—The old Bridewell, first built in 1618, along the northern side of Green Coat School and Hospital, on Tothill-side, stood until 1836, when its gateway, lock, and keys (see lithograph plate in last issue) were removed as relics to the new Tothill Fields Prison, erected in 1830-4 at a cost of 186,000l. upon about nine acres of land—between Ashley-place and Francis-street—purchased for 16,000l., and situated near the then Palmer's Village, after Robert Abraham's plans and designs, for 800 prisoners. The plan consisted of several wards, including forty-two day and 348 day-rooms, arranged around a central garden, the governor's house, with chapel above, being in the front. The entrance, on the south-east, in Francis-street, had a handsome elevation of granite, with a porticulis, and the whole structure, for which ten millions of bricks were used, was considered to form one of the finest examples of brick masonry in London. The outer wall, one-third of a mile in length, was 4 ft. thick at the base. The materials were sold by auction in February-March, 1884, and Ashley-gardens and Ambrosden-avenue now divide the site into two portions. The portal and inscribed stone of the original Bridewell were set up against the north wall of the Sessions House, since rebuilt, where they are still preserved. In 1850 Tothill Fields Prison was reserved for women convicted in Middlesex and youths under seventeen, and latterly formed the women's prison for all London. The site was acquired from the Crown by the Westminster Land Company, who in February, 1884, conveyed 4½ acres of the ground for a payment of, it is said, 55,000l. (since valued at about 300,000l.), with exchange of lands to the late Cardinal Manning, Monsignor Gilbert, and Canon Bamber for a new Metropolitan Cathedral in fulfilment of Cardinal Wiseman's project. In 1894 the design was committed to Mr.

John F. Bentley, who, after some months' study amongst the churches in Italy and consultation with Cardinal Vaughan, adopted the older Byzantine style in preference to that for a basilica as at first proposed. Of the new structure, described in our columns, July 6, 1895, February 25, 1899, and June 23 last, Cardinal Vaughan laid the foundation-stone on Monday, July 1, 1895. The contractors are Messrs. Shillitoe & Son, of Bury St. Edmund's. The works are being carried out "by schedule," up to December last the sums paid amounted to 134,600l. It is further proposed to build an archbishop's residence, together with a convent for thirty Benedictine monks and forty-five lay brothers. We gather that the exterior ornamentation of the cathedral will be mainly confined to the facade, the decorations being concentrated upon the interior. The church of St. James-the-Less, in Upper Garden-street, 1860-1, by G. E. Street [June 15, 1861, and March 15, 1862], was built at a cost of 9,000l., and endowed in memory of Dr. Monk, Bishop of Gloucester and Bristol, and formerly a Canon of Westminster, by his daughters. The fresco above the chancel arch is by Mr. G. F. Watts, R.A., the painting of the roof is by Messrs. Clayton & Bell, the carving by W. Pearce—all after Street's designs. St. Andrew's, in Ashley-place, 1851-5, is by Sir G. G. Scott; St. Stephen's, with parsonage-house and schools, in Rochester-row, 1846-7 (B. Ferrey, the glass by Wallis), were built at the cost (30,000l.) of Lady Burdett-Coutts as a memorial to her father, Sir Francis Burdett, Bart., who for a long period represented the borough in Westminster. The building in Francis-street for married men of the Guards regiments was designed, 1853, by H. A. Darbishire; Artillery Mansions are by Messrs. Waterhouse & Son, 1900; and the buildings on the site of Artillery Brewery, 1894, by Mr. John Calder, the contractors being Messrs. W. King & Son, 27,046l.

Notabilia.—For buildings, events, &c., not cited in the foregoing text:—

The Star Chamber, pulled down in 1836, some of the ornamental fittings of the Court Room removed to the dining-room at General Sir Edward Cust's country-seat, Leasowe Castle (see Capon's drawing, 1793, in the Walmisley Collection). *Little Dean's-yard*: Ashburnham House—the south wall raised, and the south part of the hipped attic roof altered



Fig. 6.—Milton's House in Petty France, Westminster.
(Now pulled down.)

meet and convenient house for twenty poor aged folk and twenty children," and appointed the Lord Mayor and Aldermen of London to succeed her last surviving executor as Governors of the trust. The hospital, as rebuilt, *temp. Anne*, was enlarged with a chapel in 1732, and in 1821 with a school-room and dormitory for the extended school that in 1873 the Charity Commissioners took into their scheme for the United Westminster Middle-class Schools—Palmer's (1653), Emery Hill's (1708), St. Margaret's (Greencoat, 1633), and Emmanuel—now in Palace-street. The buildings stood on three sides of a quadrangle, each of the two wings containing ten one-storied sets of rooms. The materials were sold on February 20-1, 1894, and in July of that year the late Lord Justice Chitty sanctioned a scheme for the apportionment of the eleemosynary endowment whose income had fallen to 2,600*l.* a year. St. James's-court (C. J. C. Pawley, 1896-7) has been built upon the site; the large gates, of forged and hammered iron, by Messrs. Starkie Gardner & Co., after Mr. Pawley's designs, were illustrated on December 12, 1897. Close by are the new Christchurch Schools, 1899-1900, by Messrs. Beazley & Burrows, who also enlarged the Bluecoat School [July 16, 1898] in Cuxton (formerly Little Chapel) street, removed thither from Duck-lane in 1799; the later schoolhouse, at Brewer's-green, which some attribute to Wren, was built by William Greene, owner of the still existing brewery. "Green's brew-house" is plotted in Evans's rare map-plan of London, 1799, as next, south, to the chapel—formerly Dr. Dodd's, now St. Peter's—in Charlotte (now Palace) street, Stafford-row, and was, it appears, the predecessor of Elliott & Watney's (see above), by the long-familiar sign of the White Hart. The Charity Commissioners framed a scheme in January, 1898, for the sale of the Bluecoat School at not less than 9,500*l.* to the Vestry of St. Margaret and St. John united parishes. Near the end of James-street are the headquarters of the 7th Middlesex "London Scottish" Volunteers—J. Macvicar Anderson (1885)—and Queen's Hall, the headquarters of the Queen's Westminster Volunteers. For the Town Hall in Caxton-street, opened on July 19, 1883, Messrs. Lee & Smith won the first premium [October 9, 1880]; it occupies the site of St. Etrian's Hill Workhouse, and, on the north, of Van Dun's Almshouses. The cost, about 42,000*l.* of the hall and site was quite met by the sale of the old workhouse in Marlowe-road to the Kensington Board of Guardians. Westminster Chapel, 1840 (John Tarring, *ob.* 1875), at the corner of James-street and Castle-lane, site of the old

venor, Bart. (*ob.* 1700), ancestor of the ducal house of Westminster. Pennant, whose account is somewhat confused, says the house "was rebuilt in its present form by the Grosvenor family"—it is plotted as "Belgrave House" in Horwood large-scale survey of May, 1799. It is commonly averred that the Penitentiary House was built upon the site of Peterborough House. We have been at the pains to ascertain by measurements on old and new maps and surveys that the south wall of the house—the river there runs nearly south and north—stood 108 yards distant from the middle line of Horseferry-road; that distance struck on the large scale Ordnance survey (1867) ends at about 11 yards short of the south end of Grosvenor-wharf, and at a point 146 yards distant from the nearest angle of the prison's outer wall, which angle was 99 yards from the river wall. The two Acts, 52 Geo. III., c. 49, and 56 Geo. III., c. 63, recite the purchase from James, seventh Earl and first Marquis of Salisbury, as sole vendor of a site for a Penitentiary House for London and Middlesex; the ground, some seventeen acres, between Peterborough House and the Halfpenny Hatch (south) was bought for, it is said, 12,000*l.* A sketch in the lithograph plate gives a view of rural Millbank as it existed at the opening of the nineteenth century.

Since some misconception prevails as to the authorship of the design for the prison we may here state that in 1813 the Government awarded premiums of 200*l.*, 100*l.*, and 50*l.* to J. Williams who had been teacher of military drawing at the Royal Military College, C. A. Bushy, and Hervey, respectively, for their proposed designs. On March 7, 1868, we printed a letter from a correspondent stating that the entire fabric (the gateway excepted, which was by Thomas Hardwick) was built from Williams's drawings, in the making of which our correspondent helped him. The plan of the radiating blocks has been claimed for Jeremy Bentham; also for his brother, Sir Samuel Bentham, by Sir Samuel's widow in letters addressed to and printed in this journal. In 1815-6 Sir Robert Smirke, R.A., made good, by laying down concrete, the failing foundations of the gateway and other portions, and in the end he rebuilt, in brick, the six radiating pentagonal blocks. Owing to the defective nature of the soil the structure cost a great sum of money, computed at nearly 500,000*l.*

The prison (see lithograph in last issue) was first used on June 27, 1816, for thirty-six female prisoners from Newgate, and was completed in 1821. In 1843 it became "Millbank Prison," with a capacity for 1,000 convicts. All the

Westminster Hospital (1719), was rebuilt in 1864 after Mr. W. F. Poulton's designs.

In the spring of 1652 Milton, being then Latin Secretary to Cromwell, removed from Scotland-yard to "a pretty garden-house" in Petty France, which at that time was entered, through its garden, from St. James's Park; he remained there until the Restoration, becoming totally blind in the interval. The house (fig. 6), since numbered 19, York-street, and rented in 1812-9 by William Hazlitt for the poet's sake, gave place in 1877 to Mr. Hankey's "Queen Anne's Mansions" (begun in 1875), where the lawn includes the ground of Milton's garden.

Millbank.—The grounds of Peterborough, known also as Belgrave, or Grosvenor, House (pulled down in 1869) extended northwards to Market-street, since Horseferry-road, and westwards to alignment with Marsham-street. The house, built by John Mordaunt, elevated Earl of Peterborough in 1628, was bought by Alexander Davies, of Ebury, whose only daughter and heir brought the estate in marriage to Sir Thomas Gros-

doors were of iron, the cells, galleries, kitchens, laundries, yards, &c., being paved with York or Portland stone. About nine acres of the site consisted of the burial-ground, exercise-yards, and gardens. Having ceased to be used as a convict prison, the building was finally closed on November 1, 1890. The materials were sold at auction at intervals in 1892-3. On October 24, 1893, the London County Council resolved to purchase about ten acres of the western portion of the site at 2,500*l.* per acre for the erection, at an estimated cost of 245,981*l.*, of dwellings for 3,700 (since increased to about 4,500) persons of the working classes. In February, 1897, they instructed their then architect, Mr. Blashill, to prepare plans for about 1,200 persons. In a limited competition for a "specimen block" of further buildings Mr. W. D. Caröe, as assessor, awarded, in March, 1899, the first premium of 150*l.* to Messrs. Spalding & Cross, the second of 75*l.* to Messrs. Joseph, Son, & Smithem, out of sixteen competitors. Of the seven completed blocks, the first five were completed in the course of last year; they are named Turner, Hogarth, Millais, Leighton, and Romney buildings. In the south-eastern corner of the prison site has been erected by Messrs. Higgs & Hill, after Mr. Sidney R. J. Smith's plans and designs [January 2, 1897], the National Gallery of British Art, the gift to the nation of Sir Henry Tate, Bart. (*ob.* December 5, 1899), and opened by the Prince of Wales on July 21, 1897. Mr. Sidney Smith's design was completed by the building of ten more rooms for pictures and sculpture, in 1899, by Messrs. Higgs & Hill.

THE ARCHITECTURAL ASSOCIATION: HINTS ON THE PREPARATION OF STUDENTSHIP DRAWINGS.

AN ordinary fortnightly meeting of this Association was held in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., on Friday evening last week, Mr. W. H. Seth-Smith in the chair.

The minutes of the last meeting having been confirmed, the following gentlemen were elected Members of the Association, viz. Messrs. H. W. Clapson, C. L. Gill, H. J. Rippon, and K. D. S. Robinson.

Mr. R. S. Balfour, Hon. Secretary, announced the following classes commencing, viz. the Elementary Water-Colour class on January 11, and the Elementary Construction class on January 14.

The Chairman said he very much regretted to announce the death of a past-President of the Association, Mr. H. C. Boyes, and he desired to move that a vote of condolence be forwarded to the relatives of the deceased gentleman.

Mr. R. Weir Schultz then read the following paper entitled "The Preparation of Studentship Drawings":—

"Most of our studentships of the present time are rightly or wrongly awarded on a system by which, under certain conditions, drawings are submitted in competition for the various awards. It is a matter of grave question whether this is the best method of choosing the student who is most worthy to participate in the benefits to be derived from the opportunities for study opening up by the bestowal of the prize. I fancy, however, that it would be going outside the limits of our subject were we to discuss this point; we must, therefore, accept it for the moment as a fact, and try to consider how far the conditions can be acted up to with most benefit to the student and with the prospect of obtaining the best results. During the past thirty years or so architectural students have been encouraged to worship at the shrine of the fetish of mere draughtsmanship, and they have got into the way of dividing themselves into two camps—(1) that of the draughtsman *par excellence*, and (2) that of the so-called practical man. The former have been accustomed to go about with their heads rather high in the air, and a general tone of superiority in their bearing, and to be obtrusively patronising to the latter, who have been looked upon as mere 'hewers of wood and drawers of water.' It was considered a much greater merit to be able to make a pretty perspective than to be capable of working out an honest, straightforward piece of construction; and this is hardly to be wondered at, when we find that the bulk of the prizes were usually awarded, consciously or otherwise, to the

most taking sets of drawings, looked upon as drawings. Many things were responsible for this, and amongst them I think we may place the following:—1. In the case of the Royal Academy, the fact that the architectural prizes were judged by a committee or council in which painters largely bulked, the majority of whom had little or no knowledge of architecture. We can all remember instances where thorough and careful studies were obviously passed over in favour of others which had been made purposely attractive to the body of selection, often at the expense of ignoring or depressing the essential points of the subject set for study when judged from an architectural standpoint; and, indeed, students got to expect this, and, consequently, drawings were prepared purposely with a certain superficial attraction. I well remember a hue and cry which was raised by students a few years ago when by strange chance a really strong and original, if somewhat unprepossessing design, showing true genius in composition and construction, was given the first place over others better drawn perhaps and worked out on more correct archaeological lines, but which did not show anything like the same sturdy grasp and powerful, strong handling of the subject. 2. I think I may also say that Mr. Norman Shaw's beautiful drawings had a potent influence on the younger generation, who seemed to lose sight of his power of composition and daring of construction in the charm of his draughtsmanship. 3. The attraction of the walls of the architectural room at the Academy also carried weight. Men knew that a pretty drawing was more likely to be placed than a clear straightforward architectural diagram. 4. The growth of architectural competition generally, likewise created a certain demand for showy drawings, and men knew that they could command a higher price for their services if they cultivated the knack of mere draughtsmanship, and so were apt to ignore the more essential qualities which go to make a good architect.

I tried to ascertain from your Hon. Secretary the motive which influenced your Committee in selecting the subject for our evening's entertainment, but the answer I received left me more in the dark than before. I assume, however, that we are expected to give you some hints that will be useful to you. There are at least two ways in which such hints can be of service to you; but they may lead in diametrically opposite directions. The first is, hints that will enable you to go in for a studentship with a chance of winning it; the second, hints that may help you to prepare your work in such a manner that you will reap the greatest benefit to yourself from the study of the subject which has been set before you. On the first I cannot venture to help you, and will leave this to my friend Professor Pite, who, in his day, was fortunate in obtaining some of the most sought-after prizes, and who is now, I believe, a member of one of those mysterious bodies or councils who carry your fate in their hands. On the second, I can, perhaps, give you some advice which may be of use to you if only in the way of starting what I hope will be an instructive discussion afterwards.

I assume that studentships are looked upon as purely educational, that is to say, affording the young architect an opportunity which would not otherwise be open to him for perfecting himself in the study of his art. To enable him to obtain one of these studentships, certain conditions are laid down, some of which, I am sorry to say, have a considerable savour of red tape about them, and tend to hamper the student rather than to encourage him. I refer more particularly to the condition regarding size and number of sheets, scale of drawings, &c., which are in many cases needlessly arbitrary. Broadly speaking, the type of subject is of two kinds. The student may have to prepare a design for a building or a portion of a building, or he may have to submit a series of drawings, showing evidences of study of old buildings, or their accessories.

The first we may look upon as an essay in design and composition, and it will surely bear on its face the impress of the training through which its author has passed, or show evidences of the course of thought which has influenced him, but whether it will show a grasp of the sense of proportion, a constructive capacity, or an idea of fitness for a suggested purpose is very doubtful. The second will indicate that the author has visited and drawn examples of old work, or perhaps made careful and exact measured drawings to scale of an

old building—church, palace, or mansion; but how far he has peered behind the surface and tried to analyse the motives which influenced the old men, or to grasp the difficulties they had to contend with and see how they overcame them, is quite a matter of small moment as things are at present—probably the idea never occurred to him.

In the first case, we have a set of taking drawings, a plan more or less apparently workable, the elevations designed in some phase of a past architecture, and all nicely linked in with a good deal of go, carving and figure work perhaps suggestively indicated, but no cohesion, no definite note of character. You look at the perspective view; the building might be suitable for half-a-dozen purposes, it lacks expression.

In the second case you have a series of very pretty drawings with plenty of flick and dash—sketches of church towers, say, or old mansion houses, a piece of panelling or a ceiling to scale, or a church screen or font; and there may be also some sheets of coloured decoration more or less approximately suggesting the present state of the original, with all the blemishes shown to the life; but how seldom anything more! How rare to see the subjects really studied, the materials analysed, the detail and construction investigated!

Now in the preparation of studentship drawings it seems to me that draughtsmanship as such should occupy a secondary place. It is not the first essential by any means. The quality of the paper used, the tone of the ink, the breadth of the line, the way in which carving should be indicated, how mouldings should be tinted in; none of these things is of prime importance; undue attention to them will not make you a better architect. What you want to be able to do is to show as clearly as you can that you have made a thorough study of your subject. If it is a design for a new building, get your plan simple and straightforward; if an awkward site is purposely given, fit in your building skilfully and directly. Do not sacrifice everything to a hobby or a piece of empty cleverness. Get a sense of proportion and of dignity, or homeliness as the case may be, or both combined, into your composition. Ignore striving after effect as such. Make it apparent that you have considered the most suitable materials to be employed and the most judicious use of them. Do not neglect your construction. Do not overlard your design with ornament everywhere; if you want sumptuousness, you can get it by concentration more effectively than by diffusion. If it is a building for a town site, do not neglect such practical points as lighting. Do not put heavy cornices or other projections in positions where they will obstruct light and air, or where they will not be visible. Do not place your sculpture where it could only be seen at an angle of 60 deg. or not seen at all. Avoid unnecessary projections that would in reality only catch and hold dust and dirt, to be blown into the windows whenever occasion offers. Do not propose a scheme of colouring that will probably be obliterated after the first six months. Be reticent, appropriate, dignified. Give your attention to these and other such points, and do not be afraid. There will be plenty of scope left for a building with character, expression, and individuality; and see that your drawings express the building and its nature, just as the building itself should express its uses. Let them be clear, straightforward, and simple. If a perspective is required, let it not be set out from an impossible point of view. Apply the same rules generally to whatever the subject may be. Leave the books alone. There are far too many books to refer to nowadays. Sit down and let your mind have free play, and think the subject out from the beginning. By doing so you are training yourself for the real work of the future, and for tackling the real buildings you all hope to erect. There will be much harder and more complex problems to face then, but you will be able to deal with them far better by overcoming the ones of the present, and whether you win your studentship or not, you should come out of the ordeal feeling stronger and more capable by having manfully faced the real issue, by having trod the narrow path and not the broad road.

If, on the other hand, you are asked to submit studies of old work, go and examine the old buildings thoroughly; try to put yourself in the place of the old men who built them; raise, if you can, the conditions under which they laboured; look how they

made the most of the materials to their hand, and see how they overcame their difficulties, and how sometimes they did not, and had to remedy things afterwards; take warning from their weaknesses; admire their general skill and foresight; and learn what is good to be learnt from their experience; but do not think that you are going to imitate them, because you cannot if you try. Conditions are entirely different, and what was straightforward and right in the thirteenth century would be more often than not an affectation now; but come away, if you can, imbued with a desire to emulate them by trying in your day and generation to tackle your conditions as they did theirs, and show by the results of your study that you have grasped this. You may not win your prize, but you will have learned more than if you had done nothing but brought back pretty water-colour drawings and notes of useful, cribbable detail.

I do not wish to say much more now, although there is no doubt a great deal more that might be said. Do not forget that you are young, and being young, you have enthusiasm, which should carry you far and overcome many difficulties. Do not bury it in the slough of past styles—of Italian Renaissance, of Francis I., of Thirteenth Century, of Roman or Byzantine or Periclean Greek. Do not let yourselves be mere draughtsmen, but be men, and acquit yourselves like men, modern men, men of the new century which has just dawned. Yours will be the task to grapple with its complexities and its new problems. Try to make the complexities less complex and the problems more simple. Prepare to tackle them with a stout heart and with determination, foresight, and common sense. Do not mistake the shadow for the substance. Do not be slaves to a past which you probably do not understand. Do not study old buildings exclusively, but look at the works of great modern architects, men like Butterfield or Mr. Philip Webb, who have learnt the useful lessons that the past can teach better than most men, but who can never be classed with the copyists, and whose work can never be labelled with the tag of a dead style. They have worked in the period nearest to you, and have understood and tackled its difficulties. Where they have succeeded there is room for at least a hope that you will not fail."

Professor Beresford Pite then delivered an address on the same subject. He had not, he said, prepared a paper in the ordinary sense of the word, and all he proposed to do was to give a few hints on the subject. Mr. Schultz had put before them the evils of competitions and of draughtsmanship. It was certain that those evils would prevent a student from getting a studentship if he were really convinced of the evils of competitions and draughtsmanship, for in that case he would not compete. Another aspect of the matter which was equally tantalising was that, from Mr. Schultz's point of view, a competing student was always working for an impossible end—giving his attention to real building which would never be built, and working out construction which would never be constructed. A student from that point of view had better not go in for a competition. For his (the speaker's) part he would very much like to go in for a studentship competition now with all its evils.

In the first place, he desired to give them a few hints on materials. He thought that Mr. Street's advice on the subject was good advice, viz., to use only the best materials. Bad paper had an astonishing influence on a drawing. A good hard paper should be got and cheap paper should be avoided. There were many kinds of Whatman which could be used, and a very good paper, on which the Ordnance maps were printed and which stood a good deal of scraping, was that known as unbleached Arnold. The O.W. papers were good, especially an extra strong one with a very smooth surface, and there were good papers known as Joynson's. Drawing paper must bear scraping or the drawing would suffer. The best pencils should be used—the sixpenny kind he meant; for after all, in pencil drawing fine line was necessary, especially for the student, who should get a good point on his instrument. In ruling lines, a junction should always be effected where two lines meet; never stop accurately at the point where they meet, but draw them boldly across and put the point of the compass on the junction. They should never draw with the H, the HH, or the HHH, for as architects

they should draw beautifully, and the use of a hard point was about the worst habit possible for the fingers and tended to harden the student's methods. An HB would be soft enough for small scale, but for details a softer pencil could be used. They should draw mouldings with a free and running line, and the best instrument for the purpose was a brush, which afforded plenty of freedom. India-rubber was a very important adjunct. Any artist or architect who was such an accomplished worker that he had no need of india-rubber must be a very bad designer. He judged a man's artistic morality by his india-rubber. An architect must have an elastic conscience, as far as that went, made of india-rubber. Rubbing out was the test of perseverance, the test of revision. The late Professor Reginald Stewart Poole, of the British Museum, once said, and said truly, that the governing principle of Greek design was elimination; they eliminated and eliminated down to that point of refinement where the work would stand no further elimination; in other words, they rubbed out. Their friend, Mr. Devey of the profession, once sung the praises of india-rubber in some clever and amusing verses which were published in *Architectural Association Notes*. As to pens, they should avoid those abominable crow-quill mapping pens, which were as vicious as hard pencils and quite calculated to spoil a drawing; at the same time, for fine work a fine pen was needed, and those known as Edinburgh Fine Points were to be recommended. Decent quill nibs were difficult to get in these days, but students should not be put off with bad ones, for bold and free sketching. It was good practice to learn to draw with a pointed stick, for by that means they got breadth of line. As to bottle ink v. stick ink, the bottle ink was convenient, but to his mind it was a doubtful blessing. It was perfectly black, it was true, but under india-rubber it lost its brilliancy. With bottle ink, too, they were always sure to draw with that same dead black, and his advice, in short, was to flee the bottle and use the stick. They needed an ink which they could erase, and he thought that stick ink erased better than bottle ink. For erasing ink they should use the hardest and best ink eraser. Attempts to wash out ink lines or to scratch them out were, as a general rule, likely to fail. As to mounting drawings, mistakes were fatal. It was undesirable for a student to experiment when mounting his drawing, and he very strongly advised them, if they had a set of drawings on which they had spent much time and thought, to put them in the hands of the picture-frame maker, especially if they had got to the last week or day before sending in. They should use cheap strainers, and should have them stout enough; if they did not, the strainers might depart from the office nice and flat, and when they were seen on the walls the corners would be buckled up owing to the drying of the paste. They should have an eye to marginal lines. Very nice paper was to be had, but often drawings were spoiled by a horrible blue or a too dark brown. There was nothing safer for a black-and-white drawing than a white margin. As to the size of the strainers, he did not think we had them large enough, though that was chiefly on account of want of room. In the Alpine Club the Institute of Architects were now hanging 160 strainers more than last year, and of course there was not room to show them. Architects ought to, and perhaps one day would, have a suitable room for the exhibition of such works. As to the writing on the drawings, architectural printing revealed character as much as handwriting—perhaps a little more accurately. A pompous fellow, full of eccentricities, would be almost sure to show it in his architectural printing. Writing on drawings should be well and plainly done, though they should not imitate printers' type. Then there was the fine fun of selecting mottoes, which afforded the only chance a student had of being a little patronising to the adjudicators, and it was interesting to notice how character came out in the selection of mottoes. Their friend, Mr. William Scott, who had since turned his attention to etching, went in several times for the Institute Soane Medallion, and the motto on the drawings that finally won him the prize had the splendid motto: "Choose well; your choice is brief yet endless."

As to the methods of finish, if the Association were in the habit of passing resolutions, he thought that a resolution addressed to pro-

motors of studentship competitions, to the effect that drawings need not necessarily be finished in black and white, would be a healthy one. Black covered a multitude of sins; it was inimical to effects, and led to carelessness in drawings. Windows, for instance, were made black instead of inlets for light. He did not know why black had grown to be a necessity in such competitions, but he supposed the promoters were afraid of being bamboozled by colour. There really was a fine scope for the careful use of colour in the getting-up of an architect's set of drawings, and the whole paper technique of an architect ought to be artistic and satisfactory. In default of colour he would sooner have a whole set of drawings in outline, which would lead to the cultivation of boldness and quality of line. There was nothing more deceptive than to draw a set of drawings and then to black them in, for the black destroyed a fine line altogether. Window black was especially mischievous; vertical lining was better. They should avoid free etching on a geometrical drawing, and he thought the shadow etching which was sometimes seen in deficient elevations was a mistake, for it took the attention away from the elevation and its proportions.

In students' designs sketchiness was not possible or permissible, for as in painting and other forms of drawing, the line of demarcation between sketching and finished work was very definite indeed. The Royal Academy did not, they would say, exhibit sketches. Every picture must have a finished background, and there was just the same distinction of line in architectural drawings. A sketch had a charm and freshness which, though attractive, was manifestly different from the finished study. Complete perfection of the accomplished geometrical drawing should be aimed at, but the two elements of students' drawings should not be mixed up. Students should not raggedly sketch in tiles, &c., on to a carefully outlined drawing. He did not see why shadows should not be scientifically put in, and any student able to do that successfully would have a good pull over those who had not acquired the art.

In spite of its sinfulness, he must say there was a charm and a pleasure in accurate draughtsmanship—in sitting down and trying to excel in it; in trying to draw the dentils and brackets of a cornice, for instance, in such a way as to watch the growing effect; and gradually bringing in detail and letting the building gradually grow up. In inking in elevations they should give attention to the effect of lines; but, unfortunately, this was seldom done. In treating ornament, they should give attention to the concentration and grouping of those lines which made the drawing effective. They could not be too much concerned with the actual lines which told in an actual building, but they should always bear in mind the very important truth that a building never looked as it was seen in elevation on paper. When they were dealing with elevations they were dealing with diagram. There was a definite, logical difference between the elevation, viz., what the building was and what the building appeared to be; there was no real relation between the two apparent to the eye. As to the indication of surface and material, a great deal of interest could be given to a drawing if this were studied carefully. They would realise that drawing horizontal lines 3 in. apart all over the building made it look like brickwork; drawing them a foot apart, like stone; and omitting them altogether, like stucco. He had seen beautiful drawings in ink with the brick-course lines put in in pencil and the stone joints in their order, not to confuse the construction lines. But these methods should be used only so far as they gave a conventional effect akin with the materials of the surface.

Plans could be made impressive by the simple art of dotting, and a crooked plan could be made to look quite important by the aid of dots. Pavements and ceilings, fully shown, often made a drawing very interesting, and students must take advantage of these points, especially as they were not asked to show drains and gullies. The interior of a building should be shown in section; it was an opportunity for display which was all studentship drawings were for, and students should make the most of their opportunities. He would advise students to take full advantage of the size of strainer, and make the size of the strainer the ultimate size of the building.

In the detailed drawings, which were usually

wanted, a rare opportunity was afforded. The promoters of the competition knew pretty well the sort of thing they wanted in the elevations, but their minds were blanks as to the detail, and they directed that some part of the elevation must be drawn to a larger scale. That was the student's opportunity for display. He should show his freeland and indulge his humour in sculpture, and generally show what sort of a man he was. They should draw boldly, and he should make up their mind that their detail should not be overcome by a neighbouring perspective, or by the plan in black above or below. In detail there was an opportunity for using with plenty of freedom the pointed stick. Mr. Schultz had advised them to take the perspective from a possible point of view. He (the speaker) said, do not, and for this reason: the building would never be built, and students should be absolutely unfettered. They should be as original in the matter as they could, and if there were any choice, be imaginative—taking an imaginary standpoint rather than an actual one. They should say to themselves: "This is to be a picture, not a perspective; this is the end of my design; this is all I have been working for; I have come to the point when I can enjoy myself in laying out the richness of my imagination, spreading it large upon the strainer." The building would never get nearer actuality than that; therefore they should make the most of their opportunity. Of course, the perspective would fail badly if it had no relation to the design, and they must work the thing out so as to give it its value. In that connexion the best thing he could do was to give them an idea of what he meant. Take the perspective drawings of Piranesi, the great perspective artist; look how he revelled in the idea of vastness! Take the drawings of William Burges, when he was purely imbued with the Gothic flavour; he drew St. Simons Stylites simply for the sake of drawing, and for nothing else—a most delightful drawing which would for generations do students good to look at.

As to coloured perspectives, they had got into disrepute owing to the weakness of competition assessors. One of the most distinguished R.A.s of the day—an accomplished water-colour artist—issued competition directions with the almost invariable rule: that the perspective was not to be in colour, but was to be in outline. There was no monopoly of this art, and it was open to all who would like to venture. He would suggest that wherever they had the opportunity they should master the art of colouring architectural perspective drawings. That was a large order, but still there were plenty of opportunities for the proper study of the subject. They should go to the picture galleries and look at the works of that wonderful old architectural draughtsman, Mackenzie; say nothing of Prout and Roberts and Holland. Turner's extraordinary accuracy of architectural drawing should be studied, although in the ordinary sense of the word Turner was not an architectural artist. There was Mr. Ernest George, too, who had founded his delightful method on a sympathetic study and mastery of the art of Prout and others. It was a Fine Art which was being lost owing to our prejudices and the decrease of the art of chromo-lithography.

As to pen-and-ink work, the greatest duffer with the brush, or the most nervous architectural artist, was safe in an outlined diagram, and this was possible to those who were nothing more than geometrical draughtsmen, and could be made quite interesting and beautiful. Of course, if they liked to go farther, and shade it in pen-and-ink, they would be going outside the bounds of diagram-drawing into a new world altogether, where they would need someone to guide them. For the study of pen-and-ink work, he would advise them to study etching, or the works of etchers. The tendency in all pen-and-ink work was to get black spots and darkness without composition or line effect. An accomplished artist like Mr. Axel Haig never failed in this respect; his old black-and-white drawings showed that they were equally true in composition, weight, and value. There was that gradation of tone in Mr. Haig's work which was difficult to attain in pen-and-ink work. They should get a good type and follow it thoroughly; Mr. Norman Shaw, for instance, afforded a beautiful type, and had founded a school which was not difficult to follow, as the methods were clear. Foliage and foreground were subjects of diffi-

culty. Students could not go to some clever artist, as Mr. Shaw did, and get foliage put in; but rather than do it badly, students should omit it. They should study the work of the old men, and notice the way in which they filled up the foreground with architecture—with steps, terraces, pavements, and frustra. That method was open to architectural students who knew more about such things than they did about foliage. He had found useful the pen-and-ink sketches that accomplished artists used to put in the catalogue of the oil and water colour picture exhibitions. The wretched little photographs now put in were no good, but the pen-and-ink sketches which were their predecessors were exceedingly useful. If the student wanted to put in trees, he should take time in studying them, and obtain photographs and draw fully and carefully from them.

As to measured drawings, that was another class of work altogether, and must be dealt with rather more differently. If the drawings were to 4th scale, the plan should be done first; then the line of heights to the scale of the plan. Beginning at the top and working downwards the mouldings should be made full size and not touched afterwards. A few leading dimensions should be taken on the spot, and the building drawn to scale and the mouldings filled in at home from the full-sized drawings. The plot-scale sketches ought not to be touched again, for the redrawing of them robbed them of all their life, and studentships which were given for measured drawings not done on the spot were worthless, and, in his opinion, the prize for measured drawings should be for work done on the spot only. In this connexion the student should pay attention to the time of the year, so as to give the necessary days instead of hours to doing the work properly. In measured work, everything that Mr. Schultz had said about construction was essential. The student was not designing, but recording an accomplished fact, and unless he studied that accomplished fact thoroughly he would not do himself any good. They had to learn to think backwards—to begin with the finished building and go back to the elements out of which it was produced; consequently, they should measure the joints and show nothing which had not been measured. They should not, for instance, take the drawing home and proceed to tack on the stonework. If they wanted to show the rubble, they should measure it. That seemed a hard task, but they might measure, say, 3 ft. of it very carefully. This was an invaluable study and equally necessary for both beginners and advanced students, who ought to sketch and measure with thoroughness to the end of their studying days.

As to pretty pencil sketches, they could be done for their own sake—or for the ladies—and students could, and should, enjoy such work in doing so. Such sketches had their work to do, as had other pretty things in this world; but such work should not be confounded with the steady, businesslike drawings which were useful to an architect.

Mr. Schultz had given good advice as to colour decoration. It was very difficult to judge colour decoration from sketches or drawings, and he was inclined to think that drawings of colour decoration were of doubtful value. The colour deceived one, and it was difficult to translate on paper the actual colour of the building itself. One was liable to be greatly deceived, though of course it was necessary to take note of arrangements in the design. For the purpose of studying colour they should go to flowers, the old masters, and ceramics. One rarely got good colour out of old buildings, for the mediæval builders avoided harmony and indulged in positive contrast; whatever harmony in colour there was in old architectural works was the result of time—a refining fog, which made old buildings beautiful. Still, it must not be forgotten that the original colour was often crude, or extreme. Mr. Butterfield, who realised this, used colour as the mediæval architects did, and he was howled at for his pains.

As to design, happy indeed were students. They were happier than their employers, happier than practising architects. They had no clients to worry them, every opportunity to design, no fads but their own, and these they always enjoyed. There was no limit to cost, no light and air troubles, and above all, no hurry. Students had ample time for working out their designs. Oh, the joy of being able to design just for the sake of designing—to do it because it was nice, and not for the

sake of a living! That was the delight and pleasure of a student's life—he was free from caring care, and while he built castles in the air somebody paid for him to live. Then they could realise the truth that audacity always paid, for in students' competition they could be as audacious as they liked. His advice to them in matters of design was to begin early. The Institute, for instance, published their conditions of competition in March, and the designs had to go in by Christmas. Students could do no great work if they did nothing in the matter until the summer was over. They should begin at once to work up examples, and, as they did so, they should grow bold. They should say, "This is not good enough or large enough." They should not be content, but should think there was something better to be found ahead. But as they collected examples, they must design. They should not say, "When I have collected all the designs on this subject, I will begin to design myself." If they did they would find they had collected more than they wanted, and the material would not digest. Pegasus was a greedy and lazy beast, who must only have a certain amount of food. When the student had found his material he should work upon it. If he began in March the days would begin to get longer; whereas if he left his studies for cricket and croquet, and did not commence work until after summer, the days would grow shorter. If he commenced work in March, the fever would be on him in May, and by June he would be wanting to give up the delights of sports for something more exciting—something more enrapturing—something which would take him to the desk rather than the river. There was another reason for starting early—unlimited time was needed for revision. The whole history of good design was—revise, revise, revise; the wording might be altered into—refine, refine, refine. They should give themselves opportunities for going back upon themselves, and nine months were not too many for the preparation of a successful student's design. A student should sketch, rub out, and start again and again, keeping himself fresh, so that when the brilliant idea came which would certainly get him the prize, he would be able successfully to solve the problem. For they must not forget that every problem had its solution. They should not forget, moreover, that the architect who was easily pleased with himself—the man who could knock the thing off as he came up in the train in the morning—was a donkey. Nothing could be "knocked off." Unfortunately the "knocking off" process came easily to some architects who had been in the profession a year or two, and who prepared designs for little stucco villas in provincial towns. But that was not architecture, which could only be learnt by downright hard work, and this principle underlay all good design. True, there were moments of inspiration, but sometimes they were worth nothing at all, except to please the student, for they often put one on the wrong scent altogether. Inspirations were sadly needed, but they were a doubtful blessing when they came. One could not brew from nothing, and in architecture the only way to produce was to know. The student must feed his imagination and cultivate it, and fill his mind with information; he should take up a period or style, and work it until he got to the bottom for the sake of understanding it. It was open to them to design in the style chosen—not as the ignorant architect did, but as the Academy student was taught to do. Let him design, say, an immense mansion in the style of Cyrus the Persian, as a very accomplished architect once did, producing an extraordinary design, which was published in the Architectural Publication Society's proceedings. The student should cultivate his mind by the study of Bramante, Inigo Jones, or Sir William Chambers for instance—how they drew and thought, and what detail they loved. In doing that the student would begin to draw, think, and love as did those masters, and a new world would be opened to the student, *i.e.*, the world of antiquity. It was not open to the modern architect, but it was open to the student.

In addition to the names he had already mentioned there were Piranesi, Brunelleschi, William Burges, Alfred Stevens, and he would mention William Blake, and the architectural backgrounds of Holbein. The student should avoid the commonplace and the conventional, and be academic, grand, and graceful. He should remember that it was an unreal building

that he was engaged on and yet he must make it real with architectural life. There was design of liberty for ideas: if they had to design a national monument expressive of gratitude for victory without the employment of sculpture, how would they start? They ought to be able to deal with it, because the opposite proposition, a national monument expressive of grief and mourning appealed to the imagination at once. The study of decorative art was useful to the architect in this connexion, for the decorative artist, especially on the continent, had the knack of expressing such ideas—the love of country, or a prehistoric race, for instance.

Whatever the student did, he should not trouble himself in the least about the assessors. He should not trouble whether the men who were going to judge his work cared about this, that, or the other. That was the bane of the competition system in real life. In studentship work what was important was what the student liked and wished. The student, moreover, should remember that in the event of his design failing to move the assessors, he had the chance of publishing his own design and confounding their award: the publishing of designs was an effective way of influencing opinion, and putting on record accomplished work. Labour was not only its own reward, for if the student worked on a definite line of his own, fame would come, and perhaps some day an opportunity of carrying out his cultivated ideas, which had been growing in his mind from the moment they were conceived. But all successful students were not successful architects, though, of course, there were some who were. Mr. Norman Shaw took the Royal Academy gold medal with a commonplace academic design. Mr. Ernest George got the same prize shortly afterwards. The word "student" had a relation to its end which was study. They must bear in mind that they were not studying to gain the prize or the medal: they were artists studying art for the sake of art, and as such were willing, under these conditions, to compete with others. They were servants of the art, and would continue to be so whether they got the prize or not. Competing for the prize was an opportunity for opening up and revealing the resources of an art which wonderfully exhibited the nature and aspirations of man. The greatness of architecture would possibly never appear so vast as when they took up design, as students, for design's sake—for the sake of proving its delights and pleasures. They should work with eagerness, but actuality; with enthusiasm, but with completeness. They would be lifted above mere office routine, or baser designs, with minds delighting in the cultured vision of sweetness of proportion and form, and would prove, what he believed to be a fact, that if they cultivated the memory of architectural form at the same time as they cultivated design, they would find that design would operate in their memories upon the forms with which they had stored it. If, when they saw something beautiful, they stored the impression in their minds, some day it would influence them in their design, for the idea would mature in their brain. That was a process that was necessary to any lofty view of architectural art—to progress, really, in architectural art. His advice to them was to get the imagination to operate on the last step in architecture; to try and do something better than had been done before. There were grandeurs of expression of which this unspeakable art was capable, like music. They could not describe the impression produced on their mind by the Pyramids, the Pantheon, St. Peter's at Rome, or St. Paul's or Westminster Abbey at home, though that was their fault.

The Chairman said the interesting addresses they had heard appeared at first sight to contain conflicting advice, but he thought they could be reconciled in their teaching.

Mr. H. L. Florence, in proposing a hearty vote of thanks to the speakers, said that the first address was taken up principally with the word "don't," and the second with the word "do," and he thought there would be some difficulty in reconciling them from that point of view; but the spirit was practically the same in both. Professor Pite went very much more into detail than into the broad principles dealt with by Mr. Schultz. He thought that Mr. Schultz's address was more important to competition judges and committees than to the students. Unfortunately, the views of such committees were too often formed on some of the effects of a drawing, and were the result of

personal admiration. Consequently, he thought the principles contained in Mr. Schultz's address deserved considerable attention. At the same time, he had more sympathy with Professor Pite's remarks. In preparing drawings in competition for prizes, students should show in invention what imagination they possessed, and not merely the dry facts of construction or aesthetic principle. He was not disposed to quarrel with Professor Pite for expressing what at first sight appeared to be extravagant or impossible views. On the practical side it was necessary, before students' drawings could be proceeded with, that the student should be a draughtsman first, and he was always sorry to hear anything said which tended to undervalue the mere fact of draughtsmanship. It should always be remembered that the means by which an architect conveyed his ideas to others, and sometimes even to himself, was by paying attention to the way he could best represent them on paper. Draughtsmanship was necessary to the architect for his own knowledge and for the purpose of showing his intentions to others, especially if suggestively drawn and not merely with the hard and fast lines of pencil. As to the preparation of drawings, the brush gave a freedom and breadth of view which could not be obtained by pure line drawing, and this was particularly useful when the student came to design ornament on those graceful features which helped to make architecture a fine art. There was no doubt a great deal of truth about what Professor Pite said about india-rubber, but nothing had been said about the use of tracing paper. He had always found tracing paper as useful as india-rubber, over which it had this advantage, that it enabled one to preserve first and subsequent ideas. It was interesting in that connexion to note that often when a subject had been well considered, the first idea was often the one adopted, and if preserved on tracing paper it proved of great use to them. In reference to the use of the brush, it would be of great advantage to the student to take a plain piece of paper and shade it with the brush from black to white from top to bottom. It was a difficult thing to do, but when they learnt how to do it it was of much use to them later on in getting a disposition of light and colour.

Mr. W. J. N. Millard, in seconding the vote of thanks, said it was, as he expected, difficult for the lecturers to adhere to their title. Mr. Schultz, although he said something about drawing, told them principally how to set about making a design, and Professor Pite told them both how to make a design and how to draw it. He was very glad that this had been so, for it had enabled the lecturers to give some very interesting views, and especially in the way of self-revelation. In thinking about drawing, he was reminded of early days when there were two schools of drawing and two schools of architects. The battle of the styles was then not quite fought out, and the two schools of drawing—the schools of Street and Burges—practised respectively thin lines and thick lines, and it was his fate to go from the office of one to the office of the other. It was then that he began to doubt if it really mattered whether one drew in thick lines or thin, so far as the architecture was concerned, and he had been thinking that ever since. As to the use of india-rubber, there was a legend that Street never used india-rubber. He (the speaker) knew that Street did, because he had seen him use it, and he wished he had used it more. He never knew him revise details unless the whole work had to be cut down. He worked in that way in all his work and with the idea of not revising it. He (the speaker) did not think that an example for all to follow, and he, personally, agreed with Professor Pite when he said, "revise and refine." Architectural drawing was merely the production of diagrams. Unfortunately, a great deal of architectural drawing or draughtsmanship ought only to be called penmanship, for it was playing about with a pen on paper and the worship of dots and dashes. He would not call it draughtsmanship, and it was certainly not architecture. As to pretty sketches, if a sketch happened to be pretty he did not think it was necessarily any the worse for that; the point to consider was whether the sketched had put anything into his mind in doing his sketch, and if he had done so he did not think he need be blamed just for making his sketch pretty.

Mr. F. G. F. Hooper said he should like to urge students when they were looking at draw-

ings, either of executed or contemplated work, by men who had made their mark, to do so more with the desire to see what was good in them than with what was bad or weak. He thought there was a tendency with some students to do too much sketching—sketching of pleasing bits—to the neglect of measuring, and he was glad to notice that students were being encouraged in competition conditions and in other ways to do measured work. Men were apt to deceive themselves by making sketch elevations from the ground, though they no doubt got a certain degree of accuracy. It was essential to study effects and how they were obtained, and that was possible only by means of measuring. He had just been looking at a young fellow's design for a building on a rather important site in London; the cornice was put at such a level that the blocking course was completely hidden, as also were the dormers, a careful Mansard roof treatment, and an angle turret. In street architecture it was important for men to appreciate that their work would rarely be seen from a distance.

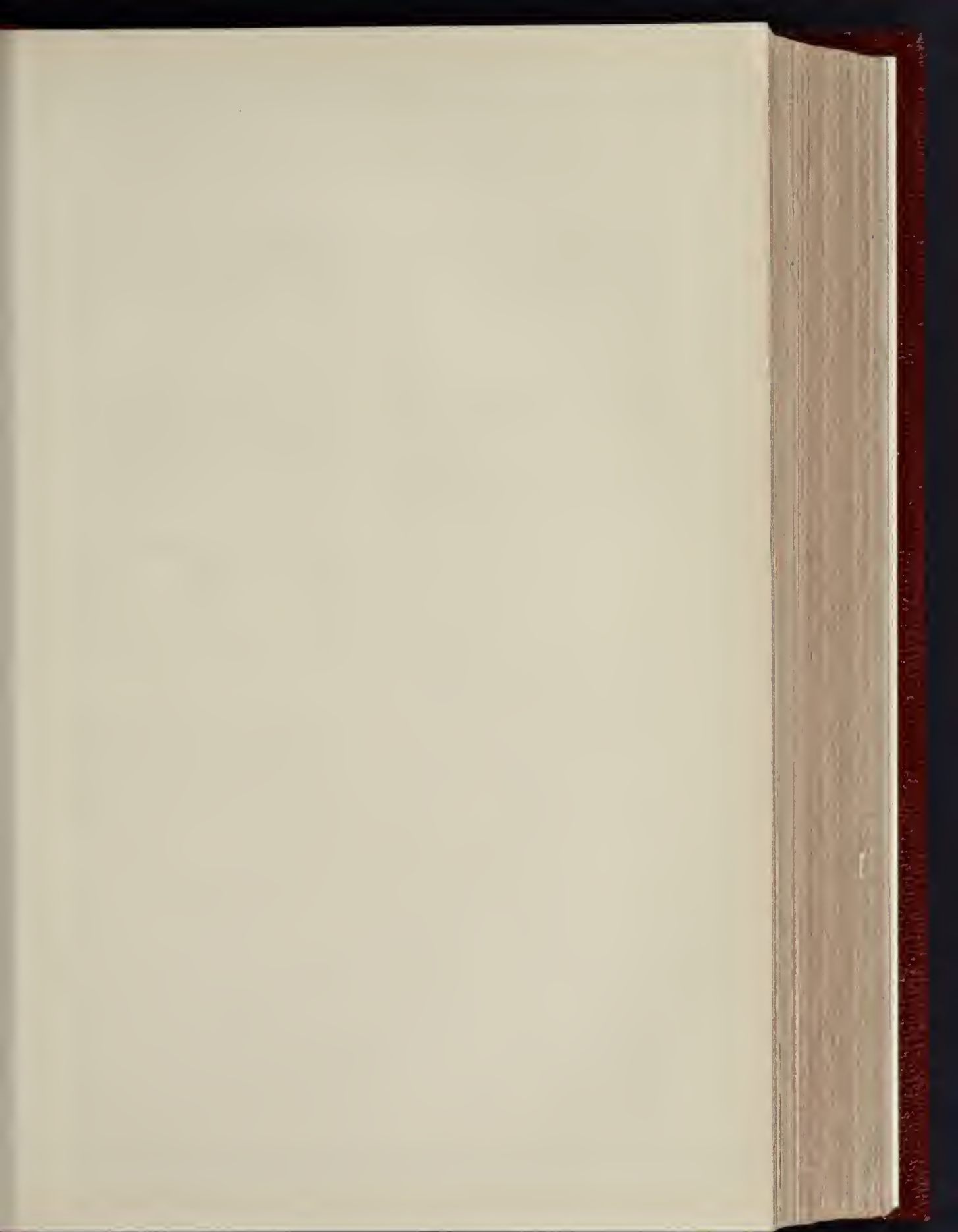
Mr. Arnold Mitchell said he thought that in one respect the advice of Professor Pite was hardly of the soundest, viz., that the student should regard his competition drawings as his ultimate object. Apparently, according to Professor Pite, a student might neglect entirely the real effect of the building so long as the competition drawing was pleasing and delighted the eye. That did not seem to be the soundest advice to put before students. It was surely necessary to think a building out in the solid—to think of it as it would really appear if put up; and a drawing prepared with that idea, and one which expressed that, would surely do the student most good, and would at least stand an equal chance of winning the competition. He thought that in doing such work they must assume that the building would be erected, and it was only by doing that that they could make the best of their work. As to the Institute competitions, a student who was competing should make up his mind that he would win, for in that belief he might feel an enthusiasm which would help him very much indeed. Students often spoke of their chances in a hopeless sort of way—"So-and-so is in for it, and I have no chance," for instance—and it was half the battle to make up one's mind that one was going to win, though, of course, no stone must be left unturned in order to attain that end. A student must use the best paper, &c., must use his india-rubber, and must draw with the greatest care, because there were others competing who would do all this. He was much interested in Professor Pite's remarks as to measured work. It seemed to him (the speaker) that the Measured Drawings competition was the first that the student should take part in. All would agree that the study of old work was essential, and he could think of no better preparation for future designing work than the careful study of some building. In doing measured work, in order to overcome the difficulty one often experienced in measuring old buildings, in regard to the varying levels of the ground—he had experienced great difficulty in getting accurate drawings of a building owing to varying levels of the ground—he made it his first work to take a short piece of straight board and to put a spirit level on it, and with a piece of chalk mark a level line round the building externally. Measurements up and down could be obtained from this line.

The Chairman said that the main point of Mr. Schultz's address was that students must prepare for practical work, and in his (the Chairman's) opinion that idea was running through Professor Pite's remarks also, and in that way, perhaps, they might be able to reconcile apparently conflicting opinions. It was desirable that the student should bear in mind Professor Pite's remark that he should not trouble in the least as to the views of the assessors; but he (the speaker) might say in that connexion that a judging committee valued thoroughly—he spoke as one of the Architectural Association Competition Committee—the power of imagination which some students displayed, and that power was made a great factor in the decision. At the same time, they looked at a design as a study by one who was preparing for practical architecture; they studied the plan, and noted what mastery a student had of building construction. Those two points of view were, in his opinion, essential. As to the bad influences which had led to the unsatisfactory state of architectural

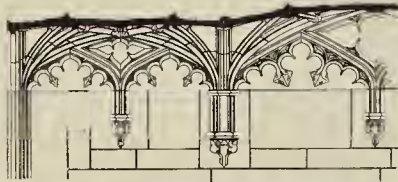
training, referred to by Mr. Schultz, that indicated the great importance of keeping the teaching of the profession in the hands of the profession as far as possible. Architects who had had practical experience of designing were the only people who could properly control the education of the architectural pupil. Even architects were led away, with the result that there were many schools, but on the whole teaching by architects would produce the best results, and hence the great importance of the Association retaining its position as the principal teaching body for London. In reference to Professor Pite's interesting remarks as to scraping and rubbing, he (the Chairman) was looking the other day, at the Rembrandt etchings in the British Museum, and he would advise all those who had not done so to go and look at them. They there saw the growth of some of this great master's pictures, and in one—"Christ being Brought out Before the People—Alter the Judgment"—Rembrandt showed what he thought was a representative crowd looking on in a jeering way. The artist was apparently not satisfied with that, and in other proofs he treated the crowd differently, and finally left it out altogether, adopting a different treatment. It was an interesting example of how a great artist would rub out and alter again and again. An artist told him recently how much advantage he had derived from practising not allowing his fingers to rest on his paper or canvas—sketching architecture freehand. That was difficult to do, but it was a point worth striving after. He was not altogether in opposition to the making of pretty sketches, for as architects had to cultivate beauty in every line, it was very desirable to make a sketch of anything which was beautiful in order to cultivate the sense of beauty. Students should not make such sketches often, however, nor instead of a practical study of architectural subjects; but they should make such sketches occasionally so as to get into the artist's freedom of line apart from the architectural. Mr. Brydon, in his recent paper in the Institute Journal on the late William Young, the architect of Glasgow Municipal Buildings, mentioned the fact that Mr. Young came out last in the first competition for that building, and when he was asked if he would, in those circumstances, compete in the second competition, replied: "Yes, the first shall be last." That emphasised what Mr. Mitchell had said as to determination to succeed, and that was the spirit which would lead to success.

The vote of thanks having been put to the meeting and very heartily agreed to,

Mr. Schultz, in reply, said that in spite of what Professor Pite had said he was not converted; nor did he think there was any need for conversion, seeing that the Professor had asked them to ignore assessors, and do exactly what they pleased in their student designs and not to compete for the mere sake of winning the prize. Those were the ideas he (the speaker) had tried to give expression to. As to the idea that students should design in a style, he supposed that the students might do that in the same way that boys at school wrote Latin verse; it was easy to learn to design in a particular style, but somehow, if they did that, the tendency was for them not to get beyond it. If they once made their architectural compositions in an archaeological manner, the inclination was to go on doing so, whereas if they began at the root of architectural design and studied materials and proportion, they would do something which would be worth looking at. It would be modern, too, and not done simply because two or three hundred years ago the same sort of thing was done. As to the drawing materials a student should use, he did not think it mattered in the least whether they used dark ink or light, or thick lines or thin, whether the drawing was mounted on brown or white paper, or no paper at all; all that did not affect the result, and he did not think that the judges considered those points. When a student began the study of a subject, of course it was necessary to look up examples and find out how, for instance, such buildings as town halls or hospitals should be arranged; but even here it would be best to get such information from the practical side and not from books. After he had got all the necessary information, he should start afresh, begin at the beginning, and think the matter out. He thought that Burges's architectural drawings were about the finest examples that existed, and he would advise all students who



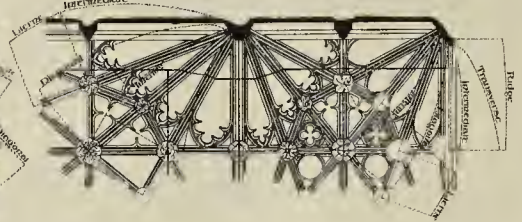
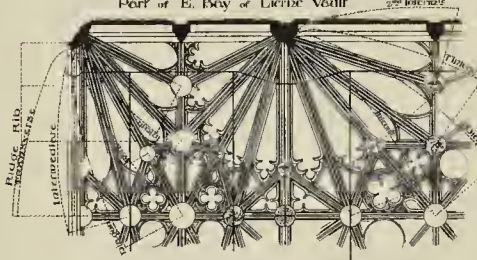
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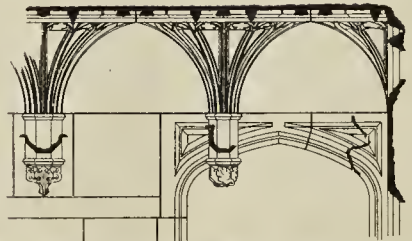
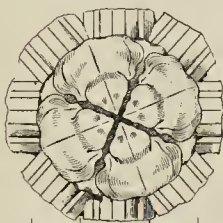
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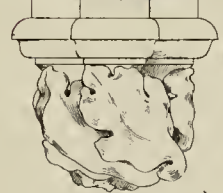
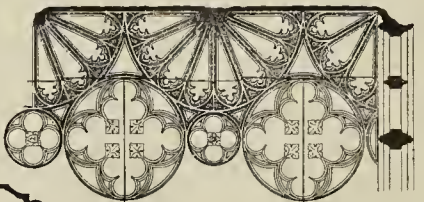
2 ft. Details of Vaulting

0 1 2 3 Feet

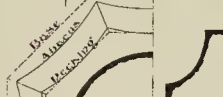
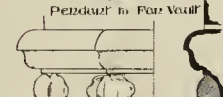
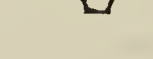
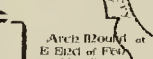
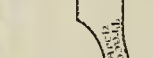
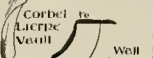
Full Size Arch Ornaments & Moulds



Plan & Section of Fan-Tracery Vault



Bosses



Corbel to Lierne Vault

Well Tracery

Lierne Vaulting Rib

Fan Vaulting Rib

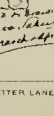
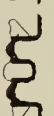
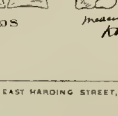
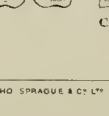
Pendant to Fan Vault

Cap

Arch Mould at E. End of Fan Vault

Base

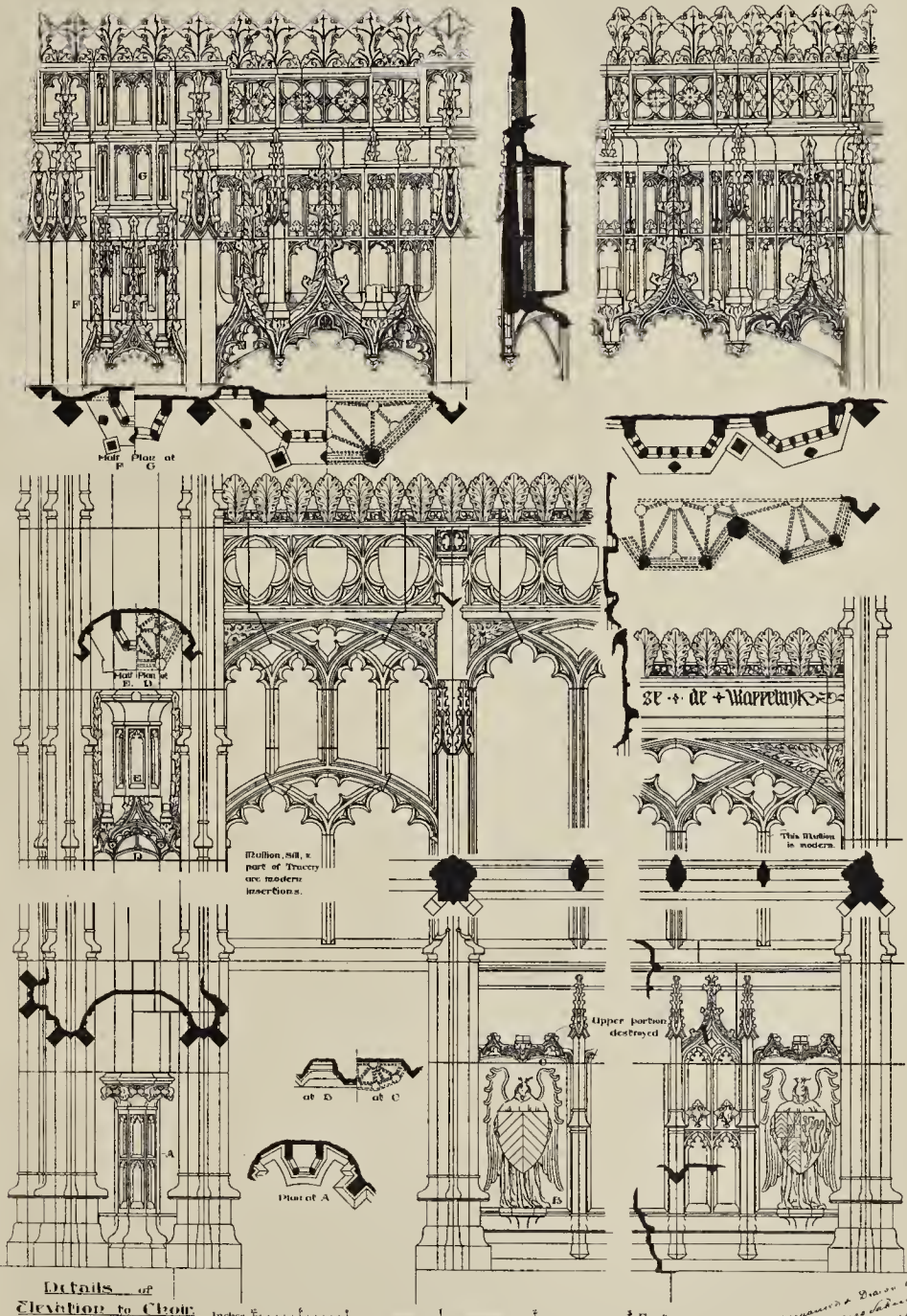
Decorative Section of



Cusps

Measured from a series of
Architectural
manuscripts.

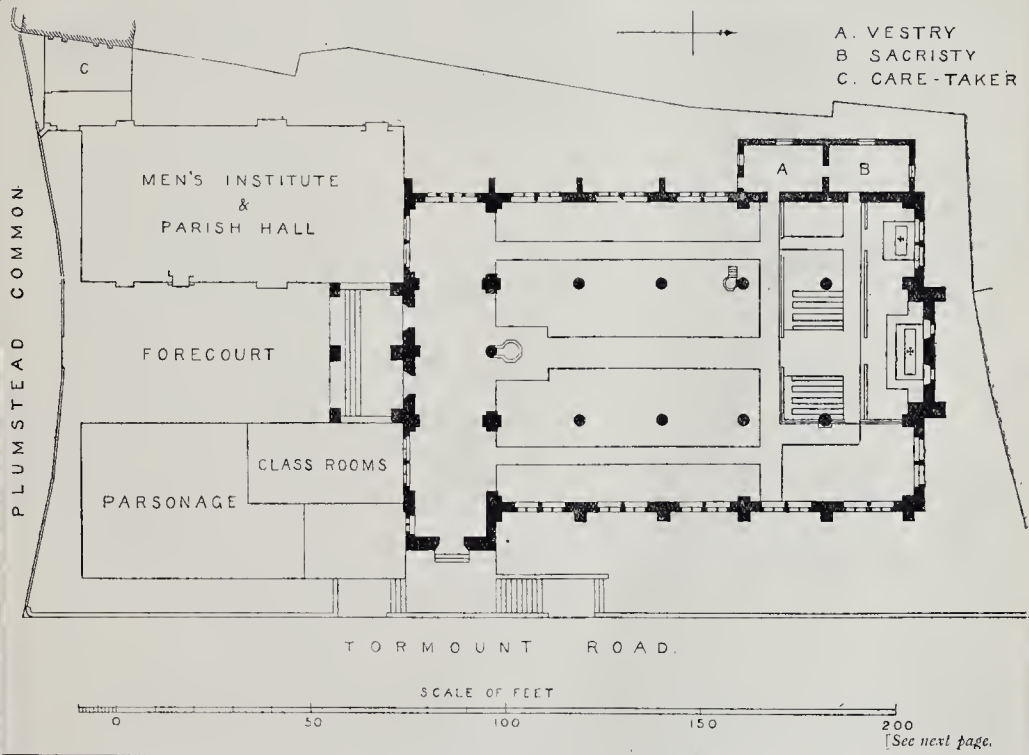
WARWICK CHANTRY, TEWKESBURY ABBEY.



Measured & Drawn by
 Robert Ludman
 March 1891



NEW CHURCH OF S. MARK PLUMSTEAD.



- A. VESTRY
- B. SACRISTY
- C. CARE-TAKER

were going in for making measured drawings of old buildings to study Burges's book entitled "Architectural Drawings," and to note especially how carefully he had gone into minute details of construction and craftsmanship with evident enjoyment, and yet had not ignored the essential elements of draughtsmanship.

Professor Pite, who also replied, said he was for actuality and reality, and not for the sham and the fraud. It appeared that Mr. Schultz wanted the student to study materials, but he did not see that the materials were ink and paper, &c. If a man would be real, he had to work with such things and send in drawings only if he went in for studentship competitions.


The Chairman announced that the next

meeting would be held on the 18th inst., when Mr. Edwin T. Hall would read a paper on "Flats," illustrated by designs of flats in London, Paris, and Vienna.

The meeting then terminated.

Illustrations.

FONT COVER, GRANTHAM PARISH CHURCH.

 HIS font cover was placed to commemorate the Jubilee of the Queen. The font itself is a beautiful example of fifteenth-century work. It is octagonal

in plan, and each side of the bowl is carved in high relief, a winged figure standing at each angle. Beneath the bowl appear various emblems and devices, and on the shaft are figures placed under canopies; but in consequence of mutilation the only clearly identified image is that of St. Andrew. The Rev. D. Woodroffe, in his interesting booklet, "Half an Hour in Grantham Church," observes: "The occurrence of the Tudor roses and the emblem of the Corpus Christi point very emphatically to Richard Fox, Keeper of the Privy Seal to Henry VII. and VIII., and Bishop of Winchester, as the donor."

The font was placed some thirty years ago at the west end of the nave, standing only

[See next page.]

upon one low step, and much of its beauty was therefore lost. It now stands on three steps, with the result that the detail of the ancient carvings is well seen. They are of Ancaster stone, and have inscriptions and sunk panels containing shields bearing emblems of the Holy Spirit, the Church of Christ, Holy Baptism, and Purity. The cover, which rises some 26 ft., is in three stages, and mainly consists of elaborate tabernacle work, and canopied niches containing figures. The lower stage is provided with doors, which, being opened, reveal the interior, containing the figures of St. Hugh of Lincoln, St. Wulfstan, the Patron Saint of Grantham, and St. Edward the Confessor. At each angle of the various stages are carved paintings with niches containing angles. Canopied niches are introduced in the second and third stages, the former containing the figures of saints and the latter of angels. Rising from this is a large carved pinnacle terminating with a pedestal, on which stands an angel with wings outspread. The whole is of English oak, stained, the canopies and carved work being emphasised by the use of gold and colour. The cover was made by Messrs. Rattee & Kett, of Cambridge; Mr. Bridgeman and Lichfield, carved the figures; Mr. Powell, of Lincoln, executed the decorative painting. The steps were worked by Messrs. Rudd & Son, of Grantham.

W. J. TAPPER.

ST. MARK'S, PLUMSTEAD.

This church is designed by Mr. C. H. M. Mileham, to be built on a site on the north side of Plumstead Common; on which also a men's institute, parish hall, classrooms and parsonage are to be erected.

The church is to accommodate more than £200. It consists of a nave and aisles of five bays (part being screened off for a chancel and a chapel) and a low aisle or galilee at the south end, a vestry and sacristy, with heating-chamber under. The galilee is extended to form a porch at the south-east angle, and to the south of the galilee is a porch of two bays, covering the steps from the forecourt down into the church, from which the floor of the nave falls towards the chancel—for the site falls considerably towards the north, and the Tormount-road, on the east side, has a very steep gradient in the same direction, rendering a retaining wall necessary.

The architecture is of a very simple round-arched character; the walls to be of concrete with inner and outer skins of rough brick-work, and a very sparing use of stone, plastered inside and roughcast outside.

The whole building will be covered with concrete vaults; a plain barrel to the nave, and a Roman intersecting vaults to the aisles. The barrel vault of the nave will carry an outer roof of fir purlins and rafters, covered with pantiles. All the other vaults will be covered with asphalt.

The plan and view show the disposition of the various buildings, the view being taken from the Common. The institute, dwelling-house, &c., are intended to be of very plain and simple work suitable to their purposes, the walls being covered with roughcast and the roofs with tiles, as to the church.

The small rough sketch is a view of the church as it will appear before the other buildings are erected on the site.

THE WARWICK CHANTRY, TEWKESBURY ABBEY.

This fine example of Perpendicular work stands under the first arch on the north side of the presbytery east of the "crossing." It was erected by Countess Isabel Despencer in memory of her first husband Richard Beauchamp, Earl of Worcester, killed at Meaux in 1421, and is called the "Warwick" Chantry as the Countess afterwards married Richard Beauchamp, Fifth Earl of Warwick. She died in 1439, and was buried in the centre of the presbytery before the high altar.

The chantry is remarkable for the delicacy of its vaulting and other carving. The western half is divided into two stories, the lower supported by two slender columns. Its position, and the other elaborate monuments in this part of the church, are shown on the ground plan, published in the *Builder* December 1, 1894.

The drawings were made by Mr. Kotaro Sakurai, a Japanese architect, who was for some time resident in London, and who is an Associate member of the Institute, though he has now returned to his native country.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fifth general meeting (business) of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, Mr. William Emerson, President, in the chair.

The minutes of last meeting having been taken as read, the following gentlemen were elected as *Fellows*:—Mr. W. Aston, Manchester; Mr. F. O. Oertel, executive engineer, Indian Public Works Department, and Government architect; and Mr. T. B. Whitney, London. As *Associate*:—Mr. F. M. Harvey, Great Yarmouth.

The Chairman then moved the adoption of the amendments and additions in the paper of "Suggestions for the Conduct of Architectural Competitions." The revised paper, which was printed in our issue for December 29 last, was adopted after amendments to clauses 2, 4, and 8. Those clauses now read as follows:—

2. The duty of assessors should be—

(a) To draw up the particulars and conditions (as far as possible in accordance with the principles set forth in these suggestions) as instructions to competitors, and to advise upon the question of cost;

(b) To determine whether the designs conform to the instructions and to exclude any which do not;

(c) To advise the promoters on the relative merits of the designs admitted to the competition, and to make a selection in accordance with the conditions.

4. The number and scale of the required drawings should be distinctly set forth, and they should not be more in number or to a larger scale than necessary to clearly explain the design. Perspective drawings are not necessary, but if the assessor advises that they are desirable, it should be so stated; and such drawings should be uniform in size, number, mode of colouring, mounting, or framing (if any), &c.

8. Where a deposit is required for supplying the instructions, it should be returned either on the receipt of a *bona fide* design, or, if the applicant declines to compete and returns the said instructions, within a month after their receipt.

The Status of the Profession.

The same meeting resolved that a committee be appointed to inquire into the status of the architectural profession, and to suggest remedies if needed.

GLASGOW ROYAL INFIRMARY COMPETITION.

This competition has excited much public and professional interest.

Ten firms of architects were invited to compete, each receiving a premium of 100l. The committee sent along with the conditions plans for the reconstruction, drawn to a scale of 20ft. to the inch. These consist of alternative plans embodying the ideas of the Medical Staff as to classification, &c. The one which seems to have found most favour with the competitors is Scheme No. 5, which consists of five different blocks.

Block A is placed at the north end of the site and six stories in height; this to be used entirely for surgical wards and the necessary adjuncts. Block B, six stories in height, is placed on the south side of the site facing Cathedral-square, it being asked that the facade to the square should, by the character of its architecture, be commemorative of the Diamond Jubilee of the Queen; the ground floor of this block being used for administrative purposes, while the five upper floors are intended for medical wards.

Block C, also six stories in height, is placed in the centre between the medical and surgical wards, and on the east side of the site as far back as possible from Castle-street. The ground floor of this block to be used for administrative apartments, the top floor for kitchen and stores, and the four intermediate floors by wards for special diseases. Block D, one story in height, is placed on the west side of the site, on the building line of Castle-street, near medical ward, to be used as isolation wards. Block E, one story in height, is on the building line of Castle-street, near surgical ward, to be used as gatehouse containing emergency wards.

Scheme No. 3 shows a method of arrangement which has only been followed by one competitor: it consists of six blocks. Block A, on the north end of the site, runs east and west, is intended for medical wards; it is five stories high. Block B, to the south of A, is five stories in height, the three upper floors being for male surgical wards, the first floor for special diseases, and the ground

floor for administrative apartments. Block C is similar to B, except that a portion of the ground floor is occupied by the gatehouse. Block D is placed between B and C, running north and south, facing, but some distance back, from Castle-street; it is six stories in height, the top floor being used for kitchen and stores. The three floors immediately below contain all the female wards of the six surgical services, leaving the first floor for special diseases, and the ground floor for administrative apartments. Block E is behind block D, on the east boundary of the site, is two stories in height, and contains isolation wards—male on ground floor and female on upper floor. Block F, between D and E, contains engine and boilers.

In the design by Mr. James Millar, accepted by the committee, two designs showing alternative schemes have been sent in. The one understood to be the accepted one follows very closely on the lines of the committee's plan, Scheme No. 5, so far as the position and arrangement of the blocks are concerned, only details being changed and improved.

There is, however, one thing entirely left out in this plan, namely, fire escapes, and the matron's parlour, bedroom, &c., are on the fifth floor; those might have been placed in a more convenient position. The kitchen is on the top floor, the food being conveyed to the various blocks through covered passages on roof. The roofs are flat, and intended to be used as gardens where patients can sit in the open air.

The buildings are in the Baronial style of architecture, and flanked at the corners by round towers, which give a fine effect to the exterior, but the circular plan does not lend itself so well as a square turret to be divided up for water-closets and bathroom. In the centre of the Cathedral-square front there is a tower rising to a height of about 160 ft., and no ornamentation being indulged in, the whole of the effect is got by large masses.

This design is accompanied by three very powerful and artistic perspectives.

The design by Mr. H. E. Clifford was placed first by the assessor, and follows the lines of the plan issued by the committee, Scheme No. 5, except that the author has attempted to improve the courtyard to Castle-street in working the gatehouse into the ground floor of medical block. The isolation block is placed fronting Castle-street, and equidistant between the medical and surgical wards, which would certainly improve the air space. The operating theatre might with advantage have had more adjuncts, there being only a splint-room, a microscope-room, and a sterilising-room.

The elevations of this design have been very successfully treated, and in outline it follows the present building, making one feel that the author in the new design has graciously considered the beauty of massing, which characterises the existing front by Adam, and we again see the beauties of the old facade adorned and lighted to suit modern requirements.

In the design by Mr. A. Hessel Tillman, placed second by the assessor, the author, like most of the competitors, has had the courage of his opinions, and produced a plan quite different from either of the plans sent out by the committee. The arrangements show considerable originality and knowledge of hospital construction, and had the elevation been equal to the plans, this design might have been placed in an even higher position by the assessor. The front to Cathedral-square is treated in the form of a circular Jubilee Ward, some distance in front and joined to the main building by a circular colonnade. The staircases are placed at the intersections, and give convenient access to all parts. There is through communication throughout. There is an operating theatre on each floor, and the adjuncts are very complete, including students' staircase, and this is got at the minimum of expense, as each theatre is over the other and one stair serves for all. The theatre has a north light.*

There seems to have been a doubt in the mind of most of the competitors as to whether shading would be allowed on the perspective, and the perspective accompanying this design seems to lose very much by being in outline.

Messrs. Watson & Mitchell, who have been placed third by the assessor, sent in two designs, A and B. The blocks in this design are entirely separate, but connected by underground passages, by which the food is taken to the various wards in trolleys. The

* A feature of this plan is the dispensary. It is placed in front of the gate on entering and underground, lit from roof and accessible to both out and in-patients, it is circular in plan.

plan A has circular wards; medical on north side, special on south, and surgical in centre. The existing St. Mungo's college is retained on the present site and pathological buildings are provided within the grounds. The plan marked B assumes the removal of St. Mungo's College, and the placing of pathological buildings on some adjacent site where it could be connected by a subway under street.

The style of architecture adopted seems very suitable for a building of this kind, and the Cathedral square front satisfies the requirements.

Messrs. S. Mitchell & Wilson's design, placed fourth by the assessor, shows a plan with a corridor which runs north and south on the east side of the site; the wards are placed at stated distances on this corridor, on the west side towards Castle-street. The central block is used on ground floor for nurses' dining-room, entrance hall, doctor's and matron's dining-room, board-room, superintendent's and matron's offices; the first floor for diseases of women; the second floor for throat, nose, and ear; the third floor for skin diseases; while the kitchen and stores cover the whole of fourth floor.

Two very carefully drawn and shaded perspectives accompany this design. The elevations are fine in detail but lack breadth.

Mr. Hippolyte Blanc's design is illustrated by very carefully drawn plans and elevations. All the wards are joined by a corridor and the blocks are well separated, but the corridor rising as it does the full height of the buildings would prevent the air from passing through the buildings. The blocks come very near Castle-street, and patients might be disturbed by the noise from the street. The operating theatre faces north, and has all the necessary adjuncts, and the doctors' rooms are well placed in an isolated position. The walls are flanked by octagonal towers, between which there is a verandah. The main entrance is from Cathedral-square.

Mr. J. J. Burnet has arranged his design with a large square on the south, with buildings on three sides and open to Cathedral-square; the plan is of an elaborate nature, but would necessitate the whole of the buildings being taken down at the same time. Some parts of the plan have been very carefully worked out in detail, and the buildings would probably have looked better when executed than they do on the drawings.

Messrs. Stark and Rowntree have followed very closely on the lines of the committee's plan, Scheme No. 3, and considerable ability is shown in the designs.

Mr. Percy Adams has a design with a corridor going from north to south, with the wards running east and west, the corridor would prevent the free passage of air as it is continued to the top floor. The administration is placed in the centre, between medical and surgical wards.

Messrs. Douglas & Morrison's plans have been remodelled on the lines of the committee's plan, Scheme No. 5, and the elevations are of a plain character.

It is to be regretted that plans were sent to the competitors by the committee, since, as in every similar case, it has only served to stifle originality.

MAGAZINES AND REVIEWS.

The *Art Journal* contains an illustrated article on "Fez, the Capital of Morocco." The sketch of the entrance gate, by G. Montbard, the author of the article, is a fine piece of effect. The other sketches are mostly of types of the inhabitants. Mr. Lewis F. Day's article on "Mere Ornament" sets out with the position that ornament need not "mean" anything, so long as it is ornamental; in which we entirely agree. Mr. Day attacks in the course of the article some catchwords of art-criticism; one of these is "joyless." He points out that if it is true that ornament will not be interesting unless the designer enjoyed doing it, the converse does not hold good. It may have interested the designer and yet be interesting to no one else. Mr. Walter Crane contributes a short article on "Methods of Art-teaching," which is rather vague, but seems to aim at a condemnation of the system of teaching by drawing and modelling the figure, as the be-all and the end-all; "a stately method," he calls it, but destined to be superseded by the teaching of the crafts. This is the gospel of to-day,

and one hears it on all sides; but this side of the matter is just as much over-emphasised by its votaries as the other side is over-emphasised in the South Kensington educational programme. The *Art Journal* continues its special Paris Exhibition supplement, of which this number contains articles on the French centennial exhibition and on the stained glass exhibits and glassware generally, much of which was of great interest.

The *Magazine of Art* contains an article on the new Louvre, *i.e.*, the Louvre as recently altered and added to, with an illustration of the fine Rubens Gallery, in which the paintings are made to fit into an architectural decoration specially designed for them; the work has been referred to and described more than once in our columns. Mr. F. Hamilton Jackson contributes an article on "The New Art as seen at the Paris Exhibition." What is called the new art, in furniture and decorative objects, appears to us to be little more than an eccentricity, the main characteristic of which is the abolition of anything like clean and symmetrical line, and the torturing of tables and chairs, &c., into unexpected sinuous curves. It is merely a kind of craze, which will not last long.

The *Studio* contains an article in praise of "Open-air Museums," showing old buildings re-erected, and other archaeological curiosities which can be arranged in the open air; an idea which appears to have been really carried out in Norway and Sweden. It might be imitated in some one of the London parks. Mr. Prior's essay on "Garden-making" is continued, with illustrations, and there is an effective pencil sketch by Mr. Pennell, an "Evening Effect at the Paris Exhibition," and another of "Moonlight on the Thames," alongside of the Embankment and its lights, by Mr. O'Brien.

The *Artist* has an illustrated article of some length on Botticelli, by Miss Edith Harwood, written with special reference to the "Mars and Venus" picture in the National Gallery. The article, in both a critical and literary sense, is of considerable interest in regard to the motifs of some of Botticelli's works. The same number contains an article on the book-bindings of Otto Zahn.

In the *Berlin Architektur-Welt* is a striking sketch by Herr Schaudt of a "Helden-Grab" or tomb of honour, a purely architectural creation displaying a good deal of poetic imagination. The illustrations of the Golgatha-Kirche at Berlin, of which Herren Spiitta & Wilde are the architects, show a fine piece of modern Gothic in brickwork.

The *Antiquary* continues the articles on "England's Oldest Handicrafts" and the "Quarterly Notes on Roman Britain"; the craft dealt with in this number being that of the potter, which is treated at more length than usual, as indeed its importance and antiquity demand. The curious font of Lostwithiel Church is the subject of an illustrated article; and Mr. W. H. Burnet contributes a short article on the ruins of Gogarth Abbey on the Great Orme's Head.

The *Nineteenth Century* contains an interesting article by Mr. John Collier on "Varying Ideals of Human Beauty." It is an endeavour to inquire into the question—what type of human beauty was really the central and the admired one in different ages, and what was the relation of pictured types to the actual life around the artist. Do the Greek statues represent the Greek men and women as they did exist, or only as they would have wished to be? Mr. Collier's conclusion is that Nature was the model, though of course a selected model. He goes through the types of various schools of art, down to the present day when we have, as far as our art shows, no fixed ideal. We might have expected to find a word as to the very conventional ideals of Burne-Jones and Rossetti and their followers, but on this point the author is silent. In the same issue Mr. Henry Jephson makes a novel and eloquent appeal for a special celebration of the new century not by "a day of humiliation," as was the fashion of the old Evangelical party, but by "a day of purification," a day on which the whole nation should agree to be for once clean, and to get rid of all dirt in their persons and surroundings. His idea is that those who once entered into such a celebration might be led to continue in the same course. It is a fine idea, though we fear not likely to be acted on.

Macmillan contains an article by Mr. M. H. Witt, on "Two Great Pictures," one by Montagna, the other by Paolo Veronese,

existing in the church of the Madonna della Monte at Vicenza. "Montagna was a citizen of Vicenza, its one painter of great note and originality, and it is in the churches and picture gallery of his native place that he may still be seen to best advantage in fresco and altar-piece." The article includes also a kind of literary sketch of the city itself.

The *Century* contains an article by Mr. E. V. Smalley on "The American Patent Office," which is of considerable interest as showing how they manage these matters in the States; better than in England, apparently, for the Government undertakes to ascertain for each "inventor" whether or not his patent is really new, or is a repetition of an idea already patented, instead of leaving the onus of this discovery with the inventor himself. The article is accompanied by some piquant illustrations of typical inventors and their interviews with the officials of the Department. The United States Patent Office is a sumptuous specimen of Washington neo-Greek architecture.

In *Scribner* is an article on "Modern Athens," its ways and its society and surroundings, interesting though rather disenchanting to those to whom the name of Athens calls up only associations with a great and poetic past, Athens seems to have a vigorous and lively present life, far enough removed from classic ideals.

The *Fortnightly Review* contains a long article by Mr. Arthur Symons on "The Painters of Seville," of whom he seems to have made a special study.

In the *Gentleman's Magazine* is an article by Mr. Percy Fitzgerald on "An Old High Town and an Old Palace," the two places being Boulogne and Kew. In the former town, it will be news to many readers, is a house with a marble tablet recording that here died "the celebrated English poet Thomas Campbell," driven to Boulogne, unfortunately, by debts and drink. Some of the recollections in reference to Kew Palace are of considerable interest.

The *Genealogical Magazine* contains "Records of an English Manor for a Thousand Years"—Thornbury Castle, with illustrations; also an engraving of the arms of the Royal Borough of Inverness, which offer the singular and rather profane combination of a shield bearing a representation of the Crucifixion, supported by an elephant and a camel *rampant*. As to the allegorical or heraldic significance of this extraordinary combination no hint is given.

Man is the title of a small new periodical published by the Anthropological Institute. Among the contents of the first number is a note, with an illustration, on a fragment of Etruscan pottery which, according to Mr. H. Balfour, the curator of the Pitt-Rivers Museum, seems to present something like the genesis of the Roman guilloche ornament, the fragment being mostly covered with double concentric circles interrupting each other by overlapping, while in one place the circles are so interrupted as to produce the "over-and-under" effect of the guilloche. We must differ from Mr. Balfour; the guilloche ornament is, according to the illustration, separated by two parallel lines from the rest of the field, and is obviously designed intentionally for the situation. The deduction made from it is therefore one that cannot be sustained.

Knowledge contains an article on a point which has been the subject of much scientific disputation, *viz.*, the real size of ocean waves. The height is much less than is generally supposed, though we think all systems of measuring the height of waves must be subject to a large element of inaccuracy. The highest mentioned in this article is nearly 38 ft., and occurred in what the observers estimated to be the heaviest sea they had known. This agrees with Captain Scoresby's calculation, made many years ago, that the greatest height of waves from hollow to crest did not exceed 40 ft.

We have received also *Harper's Magazine* (containing this month nothing of special interest to our readers), the *Revue Générale*, *The Quarry*, and the *Architects' and Builders' Magazine* (New York).

THE NEW WAR OFFICE.—The building of the new War Office, which was commenced under the superintendence of Mr. William Young, will be continued under that of his son, Mr. Clyde Young. It is stated that Mr. Clyde Young will have closely associated with him the Board of Works consulting surveyor, Sir John Taylor.

SANITARY INSPECTORS' ASSOCIATION.

A MEETING of the Sanitary Inspectors' Association was held on Saturday evening at Carpenters' Hall, London Wall, chiefly for the purpose of hearing the President's annual address.

Mr. W. H. Grigg, the Chairman, said it had been their invariable custom to listen to an address from their President at the first meeting in each year, but on this occasion their rule would be broken, because the President, who was unwell, was now abroad.

Mr. W. W. West, Chief Sanitary Inspector of Wallthamstow, said the honour of giving the address at this first meeting of the year had been cast upon him, and his subject would be "Sanitary Politics in the New Century." It was unnecessary to recapitulate the work and the results of sanitary politics in the century just closed. During the latter half since the agitation upon the subject was started by the earnest band of workers, of whom their two former presidents, Sir E. Chadwick and Sir B. W. Richardson, and their late hon. member, Sir H. Rawlinson, were among the most eminent, giant strides had been taken, and the work of remedying the bulk of the bad conditions which they called attention to had, at any rate, been put well on the way. Half a century was not a great period in the history of a nation, and the difference between the conditions prevailing then and now was a subject of intense gratification. Food, drainage, construction of dwellings, water supply, infectious diseases, and the rest of the matters with which they had daily to deal, had been taken in hand, and the grosser evils at any rate removed. Granted that in most of these matters vast improvement had been made, what was the question which most pressed for settlement? Well, as the dying German philosopher was said to have cried for "light more light," so the anemic, enervated dwellers in our cities cried for "Air, more air." Overcrowding in cities and towns was the trouble. There had been an extensive reversal of our mode of life from the open air of the country side to the close, crowded, unwholesome air of the towns. The suggestions as to a solution of the difficulty could be divided into two categories—those that aimed at modifying or palliating the unwholesome conditions, and those which dealt with them in a more radical method by abolishing the conditions. Undoubtedly, in default of removal, we should all assist to ameliorate, but the suggestions in the first category had all been tried, but on the whole with small success. Take the enactments as to overcrowding in rooms—in the first place the minimum air space allowed was necessarily fixed so low as to leave the great bulk of the trouble untouched, and then, owing to a multiplicity of considerations, experience showed that even with the most energetic and determined enforcement of the law the amount of such overcrowding was not materially lessened, as the cases were only transferred from one place to another. Again, in the erection of model or artisans' dwellings on cleared spaces, the overcrowding on area was not generally lessened, for the designers of the various schemes prided themselves upon the fact that they made provision for as many or more inhabitants than previously occupied the area by lifting them nearer the clouds. Accepting the contention that these methods, while ameliorating, did not comply with the fundamental principle of modern sanitation, which was prevention, they must come to the conclusion in favour of those suggestions which had in view the principle of spreading out, such as the erection of model villages in the suburbs, the provision of rapid, cheap transit, and the removal of many manufacturing to rural districts. If they insisted strenuously in and out of season that the welfare of the people was the highest of all laws, there need be no doubt in their hope that the century now commencing would be as full of advantages, or more so, than the last. Considerable public interest had recently been aroused by the agitation in favour of fresh air cure for consumption, and statistics had been presented showing the great number of cases existing in our cities, due, in the majority of instances, to the unhealthy state of the atmosphere produced by overcrowding. Fresh air was the cure and fresh air the preventive. Well might H.R.H. the Prince of Wales ask at a gathering of sanitarians, "If preventible, why not prevented?" Because the principles suggested were not realised or acted upon. There

was no other law of sanitarians than the welfare of the people. They were told that these conditions were brought about by "economic laws." If so, the economy was a false one, and a new one should be put in its place. Men of all shades of political opinion admitted that the working of the existing land laws had a good deal to do with the propagation of the evils they were dealing with. Then the land laws should be amended in that direction. They would probably be told, as they suggested reforms which they saw to be necessary, that they were advocating rank socialism, but every one admitted that that was a generality, but those who were interested in maintaining the *status quo* objected to its special application. Eminent men of undoubted authority had repeatedly informed them that the cost of providing dwellings (in cities) in which the humblest of the people might live under conditions of decency was really in excess of the wages which they commanded. The subject of the erection of model dwellings in the suburbs had already been considered by the London County Council, and the admirable public spirit with which they had dealt with other questions justified them in hoping that the village they proposed to erect would be a model one—not a mere extension of the town. The roads would, of course, be of ample, even of generous, width; the dwellings roomy and substantial—a delight to the eye—let at a rental bearing a reasonable proportion to the earnings of the occupant, and such things as nuisances absolutely non-existent. They were often told of the immense amount of land which had gone out of cultivation in recent years owing to its being unprofitable to till. This being so, its value was small, and if utilised for small manufacturing towns, the lessened cost of land would compensate very largely for any increased cost of manufacture due to the distance from the metropolis or other centres of population and commerce, and certainly the *status quo* would be immensely advanced in every way by the more healthy condition of mind, body, and estate, which were inseparable from life in a small centre of population as compared with life in vast cities. This solution of the trouble had already been carried into effect by some wealthy and public-spirited employers of labour. In these directions they must look for the prevention of the evils of overcrowding, and the arrival of that time which as officials of the present they could certainly contemplate with serenity, while as sanitarians they should hope and strive for, as was described in the following quotation. When the early pioneers of sanitation first advocated the appointment of sanitary officers objection was raised as to the cost of such procedure. To this they urged "That whenever the proposed local conditions were effected and complete works laid down and put in action, public servants, by whom the work and consequent pecuniary savings and savings of life and health had been effected, will have comparatively little to do, and may change their sphere of action."

A vote of thanks was then passed to Mr. West, proposed by the Chairman and seconded by Mr. J. Young.

COMPETITIONS.

BATHS AND GYMNASIUM, DUNFERMLINE.—The committee invited competitive plans for the new Carnegie Baths and Gymnasium some time ago, and at a meeting on the 4th inst. Mr. William Reid, the secretary, intimated that the plans had been received from the following:—Messrs. H. J. Blanc, Edinburgh; David Beveridge, Crossgates; T. Hyslop Ure, Dunfermline; Williamson & Inglis, Kirkcaldy; Ross & Macbeth, Inverness; Jas. T. Scobie, Dunfermline; Andrew Muirhead, Dunfermline; D. Barclay, Glasgow; W. Swinton, Dunfermline.

GLASGOW ROYAL INFIRMARY RECONSTRUCTION.—The designs of the competing architects in this competition have been on view within the City Chambers during the past week. The following are the authors, also the approximate cost of carrying out the respective designs, as estimated by Mr. Robert Whitson, the committee's measurer:—(A) Sydney Mitchell & Wilson, Edinburgh, 303,000.; (B) Hippolyte J. Blanc, Edinburgh, 269,000.; (C) Malcolm Stark & Rowntree, London, 252,000.; (D) John James Burnet, Glasgow, 219,000.; (E) James Miller, Glasgow, 241,000.; (F) H. E. Clifford, Glasgow, 238,000.; (G) H. Percy Adams, London, 245,000.; (H)

A. Hessel Tiltman, London, 321,000.; (I) Campbell Douglas & Morrison, Glasgow, 225,000.; (J) T. L. Watson and H. Mitchell, Glasgow, 235,000. Plans marked (E) have, as already mentioned in our pages, been adopted by the committee as first in order of merit by 11 votes to 10 given for those marked (F). Dr. Rowland Anderson was the assessor.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the Building Act Committee of the London County Council, on December 17, being the day before the Council adjourned for the Christmas recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the order of reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Norwood.—A church on the south side of Thurlow Park-road, West Norwood, at the corner of Court-road (Mr. A. O. Breeds for the committee and managers of the West Norwood Presbyterian Church).—Consent.

Chelsea.—A one-story addition in front of the Swiss Cottage beer-house, No. 109, King's-road, Chelsea (Messrs. A. R. Barker & Son for Messrs. Michell & Aldous, Limited).—Refused.

Fulham.—A one-story shop on part of the forecourt of No. 10, Parsons-green, Fulham (Messrs. Hewison & Peacock).—Refused.

Kensington, North.—A one-story addition to No. 150, Holland Park-avenue, Kensington, to abut upon Norland-square (Messrs. E. & A. Swain for Mr. R. T. Swain).—Refused.

Projections.

St. George, Hanover-square.—That in accordance with the request of Messrs. Trollope & Sons for Mr. C. Czarnikow, the consent of the Council of November 20, 1900, to the erection of wood and glass inclosures to a portico at the entrance to No. 103, Eaton-square, St. George, Hanover-square, be modified by the insertion of the words "except the door and frame to inclose the front of the portico" after the words "that the whole of the exposed woodwork" in such consent.—Agreed.

Strand.—A balcony, at the first-floor level, in front of Nos. 5, 6, and 7, Chapel-place, Oxford-street, St. Marylebone (Mr. A. E. Hughes for Messrs. D. H. Evans & Co., Limited).—Consent.

Hammersmith.—A porch at the entrance to the Bush Hotel, No. 54, Shepherd's Bush Green, Hammersmith (Mr. W. M. Bruton for Mr. H. Buckley).—Consent.

Hampstead.—Wood and tile porches at the entrances to ten houses in course of erection on the north-east side of Fordwych-road, Hampstead (Mr. J. Phoenix for Messrs. Bridge & Neal).—Consent.

Woolwich.—Bay-windows to Nos. 1, 2, 3, and 7, Elderster-road, Eitham (Mr. G. F. Logsdail for Mr. A. Cameron Corbett, M.P.).—Consent.

Width of Way.

Bermondsey.—A one-story addition in the yard of the stables at the rear of the Swan public-house, Old Kent-road, Bermondsey, at less than the prescribed distance from the centre of Comus-place (Mr. J. G. Enzor for Messrs. Watney, Combe, Reid, & Co.).—Consent.

Width of Way, Lines of Frontage, and Projections.

Westminster.—An overhanging angle-turret at the first and second floor levels of Nos. 17 and 19, Regency-street, Westminster, at less than the prescribed distance from the centre of Page-street (Mr. E. Dru Drury for Mr. J. V. Webster).—Consent.

Woolwich.—Nine dwelling-houses, with one-story bay windows, on the west side of Red Lion-lane, Shooter's-hill-road, Plumstead, with the front court fences and bay windows at less than the prescribed distance from the centre of Red Lion-lane (Mr. A. E. Parnell for Mr. J. Sanford).—Consent.

Hammersmith.—Two blocks of buildings on the west side of Ravenscourt Park, Hammersmith, each abutting on Hamlet-gardens (Mr. T. Athey for Mr. W. H. Gibbs).—Refused.

Space at Rear.

Strand.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of two blocks of dwellings, adapted to be inhabited by persons of the working class, on a site on the west side of York-street, Drury-lane, Strand, abutting also on Drury-lane, and at the rear on a footway on the east side of the Theatre Royal, Drury-lane, such blocks of dwellings to be provided with an irregular space at the rear, and pro-

tions of such dwellings to extend above the diagonal line directed to be drawn by Section 41 of the Act (Mr. J. Briggs for the Housing of the Working Classes Committee of the Council).—Consent.

Line of Frontage and Construction of Buildings.

Finsbury, Central.—A wood and iron engine-shed at the Sadler's Wells Theatre, Rosebery-avenue (Mr. G. E. Belmont).—Refused.

Width of Way and Construction of Building.

Southwark, West.—A block of artisans' dwellings on the north side of Sumner-street, Southwark, to extend over Martagon-place, such dwellings to exceed in height the width of Sumner-street and also of Martagon-place, and the erection of a play-shed at the rear of such dwellings (Mr. F. Bailey for the City of London Electric Lighting Company, Limited).—Consent.

Width of Way, Lines of Frontage, and Construction of Buildings.

Woolwich.—A water-tower on the north side of Shooter's-hill, Plumstead, with the boundary fence at less than the prescribed distance from the centre of The Avenue (Mr. T. B. Whinney for the Kent Waterworks Company).—Consent.

Islington, West.—An iron roof on the north-west side of Warler's-road, Parkhurst-road, Holloway, at less than the prescribed distance from the centre of Warler's-road (St. Pancras Ironworks Company, Limited, for Messrs. Beale & Co., Limited).—Refused.

Formation of Streets.

Clapham.—That an order be issued to Mr. W. N. Dunn sanctioning the formation or laying out of two new streets for carriage traffic on the west side of Clapham Common, Battersea (for Mr. T. Ingram). That the names Manchuria-road and Clapham Common West-side (in continuation) be approved for the new streets.—Consent.

Greenwich.—That an order be issued to Mr. W. J. Kemp sanctioning the formation or laying out of a new street for carriage traffic to lead from Woolwich Lower-road, Greenwich, to Hilstow-road, and in connexion therewith the widening of a portion of Lower Woolwich-road (for Mr. H. Tarrant). That the name Chevening-road be approved for the new street.—Consent.

Lewisham.—That an order be issued to Mr. W. Barber, sanctioning the formation or laying out of a new street for carriage traffic, to lead from Bromley-road to Burnt Ash-lane, Lee, and in connexion therewith the widening of a portion of Bromley-road (for Mr. A. Durbin). That the name Heather-road be approved for the new street.—Consent.

Lewisham.—That an order be issued to Mr. J. W. Rhodes, sanctioning under the provisions of Section 10 of the London Building Act, 1894, the widening of a street, used for foot traffic only, known as Brockley Cottages, Malyn-road. Ladywell (for Mrs. M. E. Barnes).—Consent.

Cubical Extent.

Islington, West.—The raising of the roof of a building at the north-west angle of the Caledonian Saw-mills, No. 13, New Wharf-road, Caledonian-road, Islington, which building will exceed in extent 250,000, but not 450,000, cubic ft., and will be used only for the purposes of the trade or manufacture of sawing, planing, and moulding timber (Messrs. Haggis & Sons).—Consent.

Poplar.—An addition to the platers' shop at Messrs. Yarrow & Co.'s works, Manchester-road, Glengall-road, Poplar (Messrs. W. Whitford & Co. for Messrs. Yarrow & Co., Limited).—Consent.

Deptford.—The erection at the Hatcham Iron-works, Pomeroy-street, Hatcham, of an addition to a workshop (Mr. J. Donald for the General Engine and Boiler Company, Limited).—Refused.

Means of Escape from Top of High Buildings.

Strand.—Alteration in the means of escape in case of fire, proposed to be provided in pursuance of Section 65 of the Act, on the third, fourth, fifth, and sixth stories of an addition at the rear of the Grand Hotel, Northumberland-avenue, Strand, for the persons dwelling or employed therein (Mr. W. Woodward for the Gordon Hotels, Limited).—Consent.

Strand.—Means of escape in case of fire, proposed to be provided in pursuance of Section 65 of the Act, on the fifth, sixth, and seventh stories of an addition to the Hotel Cecil, on the site of Nos. 76 to 88, Strand, between Carting-lane and Ivy Bridge-lane, Strand (Mr. J. Sawyer for the Hotel Cecil, Limited).—Refused.

Buildings for the Supply of Electricity.

Hampstead.—A further variation (so far as relates to the water-softening house) from the plans, approved by the Council, for the construction of an extension to the electricity generating station and works, Lithos-road, Hampstead, abutting off a foot-path between West End-lane and Finch-ey-road (Mr. J. Hudson for the Metropolitan Borough Council or Hampstead).—Consent.

Lewisham.—The application of Mr. A. L. Phillips for the Crystal Palace District Electric Supply Company, Limited, for the rebuilding of a generating station and works at Springfield-road, Wells-road, Sydenham.—Agreed.

Wandsworth.—The application of Mr. C. S. Peach for the County of London and Brush Provincial Electric Light Company, Limited, for the construction of a temporary sub-station on the north side of Yikon-road, Balham High-road, at the corner of Lynn-street.—Agreed.

Dwelling-houses on Low-lying Land.

Woolwich.—That the solicitor do prepare a licence under Section 122 of the Act, to Mr. S. J. Driver, for the erection of sixteen buildings, to be used wholly or in part as dwelling-houses, on low-lying land situated on the south side of Abbey-grove, Abbey Wood, Plumstead, in accordance with the tracing submitted on his behalf by Mr. T. J. Young.—Agreed.

BOOKS RECEIVED.

THEORY OF ENGINEERING CONSTRUCTION. By Ernest H. Essex, A.M Inst.C.E. (The St. Bride's Press.)

LOCKWOOD'S BUILDER'S AND CONTRACTOR'S PRICE-BOOK, 1901. Edited by Francis T. W. Miller, A.R.I.B.A. (Crosby Lockwood & Son)

Correspondence.

To the Editor of THE BUILDER.

"CHURCHYARDS AND THEIR ACCESSORIES."

SIR,—All interested in "God's Acre" must be much indebted to Mr. Crawfurth Smith for his interesting paper, and to yourselves for publishing it in its entirety. But when discussing God's-Acre from the æsthetic point of view, one cannot but wish that Mr. Crawfurth Smith had raised his voice much more forcibly against the vulgarities which are erected in our churchyards.

What is wanted is a Cromwell in criticism, who would teach them to get rid of these baubles of bad taste. Only by forcibly speaking can this be done. The majority of our monumental masons can neither produce anything good, nor even appreciate it. In a suburban cemetery it was my good fortune to see a beautifully proportioned cross—simplicity in itself, without any moulding or chamfer on it, and upon which Mr. Crawfurth Smith had raised his voice much more forcibly against the vulgarities which are erected in our churchyards.

What I would venture to suggest is that a member of the Association should read a paper, illustrating it with examples of our monuments, good and bad, and that monumental masons should be invited to attend.

THOMAS G. GETHING.

COLLUSION AMONG CONTRACTORS.

SIR,—As a regular reader of your valuable paper, I should like to draw attention to a matter which I have not as yet seen touched upon in any journal devoted to the building trade.

I refer to the practice of some builders—made easier when only two or three are in for the work in question—of buying each other out, and arranging that one of them shall, for certain sums paid to his competitors, be allowed to get the work.

Naturally the successful one, knowing beforehand that his will be the lowest tender, makes his price right, as besides his own profit he has to pay to his (supposed) competitors the amounts agreed upon.

I do not think the practice is common, but I have come across it on a few occasions. It seems to me a serious matter and one worthy of attention.

A SUFFERER.

FOOTWAY MASONS' AND CARRIAGE-WAY PAVIERS' SOCIETY.

SIR,—In your issue of the 22nd ult. in your report of the London County Council you report us as asking for the hours of labour to be amended.

We beg that you will contradict the report. All we have asked for is that the Council will pay us our trade union rate of wage.

W. LEARY, Gen. Sec.

* * * We took the statement from the County Council's agenda paper.—ED.

HALIFAX TOWN HALL.—Mr. Joseph Parkinson, of Lancaster, writes to us in reference to the tower of Halifax Town Hall which was illustrated in our last issue, that the spire panneling was originally covered with encaustic tiles, but before 1870 (at which time he was serving his articles in Halifax) these tiles had begun to fall off, and it was considered advisable to remove them and replace them with stone facing.

The Student's Column.

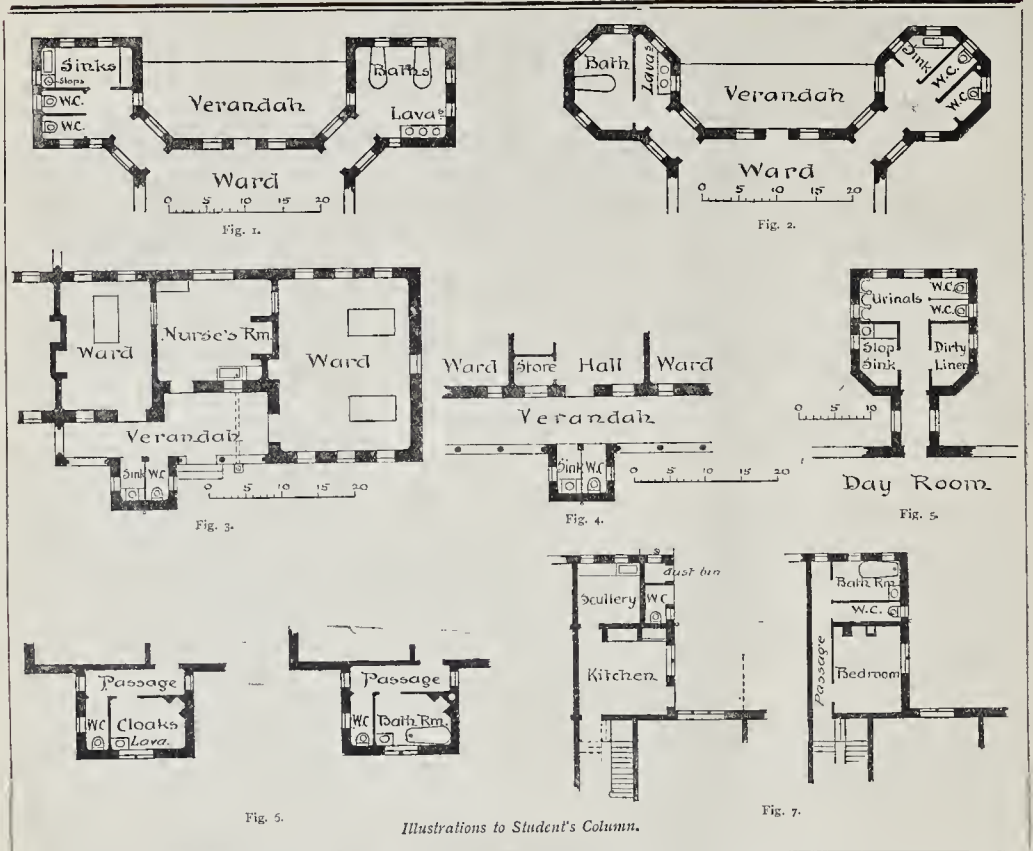
SANITARY FITTINGS AND PLUMBING.

2.—SANITARY-ROOMS.

THE diverse character of sanitary fittings necessitates considerable difference in the location and arrangement of the rooms in which they are placed, but certain general rules are applicable in every case. The most important points to be observed are plenty of light and, if possible, of direct sunlight, ample means of ventilation, impervious surfaces (at any rate, immediately around the fittings), convenience of position and plan, and (for certain fittings) privacy. If the rooms for the different fittings can be grouped together in one part of the building, although, perhaps, in two or more stories, it will be not only economical, but advantageous in other respects.

First, as to light. No sanitary fitting ought to be fixed in any room which is not properly lit by one or more windows or toplights. Borrowed lights ought not to be tolerated as the sole means of lighting sanitary rooms. The windows or toplights must be made to open, and must be of ample size. The common allowance of 1 square foot of window space to every 10 square feet of floor area is far too little for rooms containing sanitary fittings, even if the net area of the glass is taken as the basis of the calculation. For example, many water-closets measure only about 5 ft. 6 in. by 2 ft. 6 in., giving an area therefore of 13½ square feet; according to the rule, a window with a net area of about 1½ square feet ought to suffice. We need hardly point out that such a small window would be quite unsatisfactory; if placed near the ceiling it would not light the closet-basin or the floor, and if placed in the lower half of the room it would be of little use for ventilation. What is wanted is a window extending practically up to the ceiling, so that the air in the upper part of the room can be thoroughly changed by opening the window, and extending so low as to throw a direct light on the floor of the room and on the closet-basin, and seat. The width of the window ought to be such that the light is well distributed throughout the room. The area of the window in a small water-closet or housemaid's closet ought to be at least half the area of the floor. The proportion need not be so great for larger rooms, but much will depend upon the shape of the room and the position of the window or windows.

Ventilation is a most important point. The sanitary rooms of a house are those in which the foulest portions of the domestic and personal duties are performed, and yet less care is often taken concerning the ventilation of these rooms than of any other rooms in the house. In many towns the by-laws specify that an air-grate must be fixed in the external wall of every water-closet; sometimes two are demanded, one near the floor and the other near the ceiling, the assumption being that the latter will act as an outlet and the former as an inlet. Unfortunately, this assumption is often proved to be erroneous, as both grates frequently act as inlets. The value of these air-grates has been much over-rated. As a rule they serve as air inlets, and if, as is generally the case, the rooms have no extract shafts, the air, mixed perhaps with the foul air from the sanitary fittings, is drawn into the adjacent living-rooms or bedrooms, whence it escapes by means of the fireplace flues. In other words, the "fresh-air" supply of the house is to a large extent obtained through the bathroom and water-closet. The air-grates have also the disadvantage of reducing the temperature of the rooms in winter and of increasing the risk of frozen pipes. If proper extract-shafts were provided from these rooms there would be little danger of vitiated air being drawn into the rest of the building; the current of air would be in the opposite direction, i.e., from the main building to the sanitary room. In the scullery, bathroom, &c., the extract-shaft may take the form of an open fireplace or of a flue formed in the chimney breast by the side of the smoke-flue. These flues ought to be formed with fireclay tubes, thoroughly grouted around, so that the foul air cannot escape into the rooms above. In the water-closet, housemaid's closet, &c., it may be a flue of the kind just described, or a special sheet-metal shaft leading to an extracting cowl fixed on the roof.



Illustrations to Student's Column.

A clever contrivance for ventilating water-closets and other rooms in which flushing cisterns are placed has been designed by Messrs. Kerrill & Hunter. It consists of a fan actuated by the water as it flows into the cistern. Consequently, every time the cistern is used the fan is automatically started and continues to run until the cistern is full again. The fan is said to be capable of extracting 200 cubic ft. of air per minute with a 60-lb. pressure of water. This contrivance will be of service in many cases when extract-fines cannot well be provided; it has the disadvantage of being spasmodic in its action, but this disadvantage is not very serious if the sanitary fittings and plumbing are such as to exclude all drain air from the room.

In modern hospitals the water-closets, bath-rooms, and sink-rooms are generally planned with short passages or lobbies between them and the wards, these passages having windows and openings for air on both sides. Among the many positions in which these rooms can be placed, the most generally satisfactory is at the extreme angles of the wards, as shown in figs. 1 and 2. These should be planned so as not to obstruct the ward windows, and so that the currents of air through the lobbies are not in the direction of the windows either in the sides or ends of the wards. The conveniences and lobbies ought to be warmed and ventilated. If there is an upper story of wards, the same arrangement of conveniences is repeated, thus simplifying both the plumbing and drainage.

In small fever hospitals, the water-closets and sink-rooms are often placed at the side of a verandah, as shown in figs. 3 and 4. There is therefore a free current of air between them and the pavilions to which they are attached. In exposed situations, however, this arrangement is somewhat trying, as the verandah cannot, of course, be warmed; in the case of one hospital, built in this manner from the writer's design, the openings in the front and ends of the verandahs were a few years afterwards filled with wood and glass.

Similar or slightly modified arrangements may with advantage be adopted in other public buildings, such as workhouses (fig. 5), and also in hotels, houses, &c. A cloakroom with lavatory and water-closet on the ground floor of a house may have over it a bathroom, lavatory and water-closet, as shown in fig. 6. In small houses, where much money cannot be afforded, probably the utmost that can be done is to arrange that the approach to the bathroom and water-closet shall be properly lighted by means of a sash or casement window, and not, as is so often the case, a dark, unventilated passage.

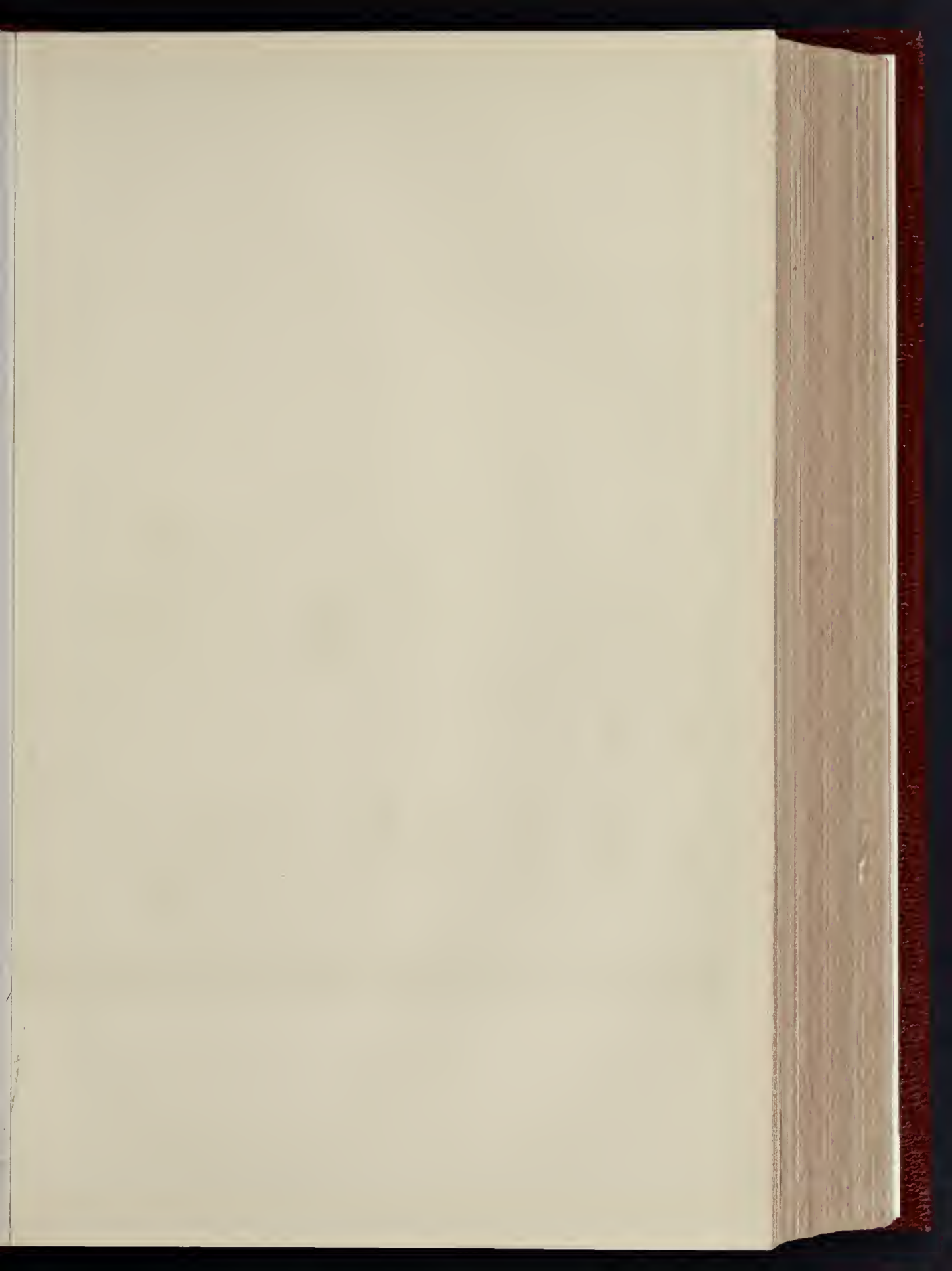
The illustrations already given also serve as examples of the grouping of sanitary fittings. This is an important point for consideration, as the grouping of fittings reduces the length of water-pipes, wastepipes, soilpipes, and drains, and therefore reduces the cost and also the dangers arising from defective materials and workmanship. An isolated fitting often requires a long branch-drain, and the nature of the fitting may be such that its discharge is not sufficient to cleanse the drain; hence, unless some method of periodical flushing is devised, deposit occurs, and the drain becomes foul and is ultimately choked. With a little care in planning, the sanitary rooms of a house can be much better grouped than is usually the case. The bathroom and water-closet can be placed over the ground-floor lavatory and water-closet, or over the butler's or maid's pantry, or over the scullery. It is a great mistake to place such rooms over living-rooms or larders, particularly if the floors are constructed with ordinary joists and boards. Fig. 7 shows an arrangement for a small terrace-house. The house water-closet on the first floor is placed over the servant's water-closet on the ground-floor, so that one soilpipe serves for the two fittings, and the wastepipes from the sink, bath, and lavatory discharge over a single gully. Only two sewage drains, therefore, are required, and these lead to the intercepting-chamber, from which the main drain leads to the sewer in the back street.

The soilpipe serves as the ventilation shaft for the drain. The sink-gully is kept clear of grease by the flushes from the bath and lavatory.

Water-closets are often placed in most unsatisfactory positions. In a great many houses they are entered from the half-space landings of the stairs, or from other equally-exposed thoroughfares. Such arrangements are most objectionable. Privacy ought to be one of the guiding thoughts in the planning of these rooms, and this is best secured by arranging the lavatory and water-closet in close proximity to each other, and by approaching the two rooms by means of a short passage or lobby, as shown in fig. 6. It is a mistake to place the water-closet in the same room as the bath and lavatory, though this is too often done. It is also a mistake to place a water-closet in such a position that it is separated from an important room by nothing more than a lath-and-plaster partition. The noise made by the flushing of the apparatus will be heard on the other side of such a partition, and even of a $1\frac{1}{2}$ in. brick wall, and it is best, therefore, to build a 9-in. wall wherever possible. The arrangement shown in fig. 6 will effectually prevent all sounds passing to the rest of the house. It is even more essential that the housemaid's closet should be out of the way, and this can best be effected by placing it near the servants' stairs.

In this country lavatory basins are not now fixed in bedrooms as frequently as was formerly done, but if the lavatories themselves, and the plumbing and drains, are thoroughly satisfactory, there cannot be any very serious objection to the practice. A better position would, of course, be the dressing-room or small room adjoining the bedroom.

The general construction of rooms containing sanitary fittings ought to be of the best. The floors—of ground floor and upper rooms alike—ought to be concrete, the ingredients to be properly proportioned so that the material is practically impervious. In sculleries, lavatories, water-closets, housemaid's closets, &c., the floors may be finished with fine concrete.





NEW CHURCH OF ST. MARK, PLUMSTEAD WITH INSTITUTE.

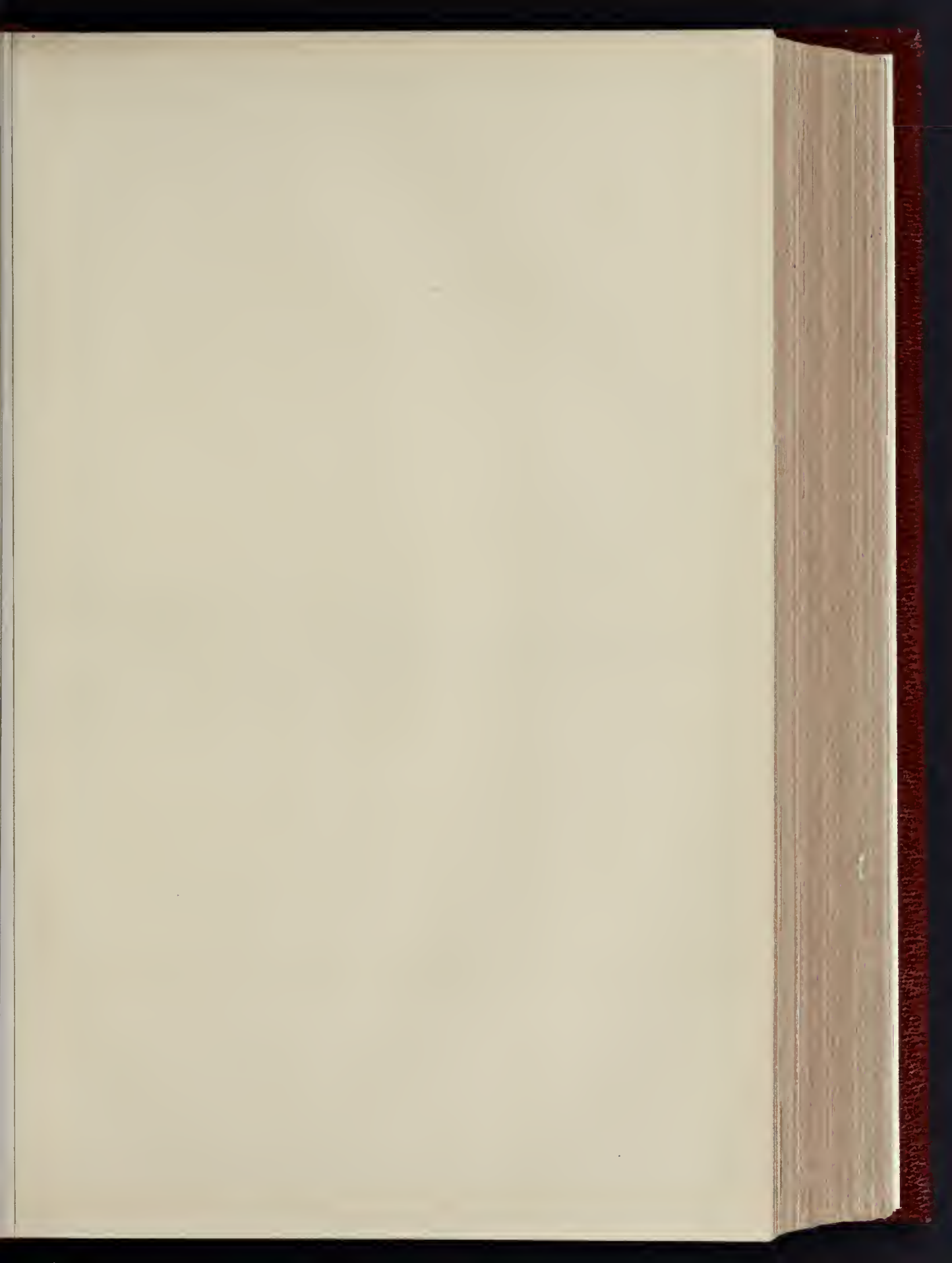
JANUARY 12, 1901.



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THE BUILDER, JANUARY 12, 1901

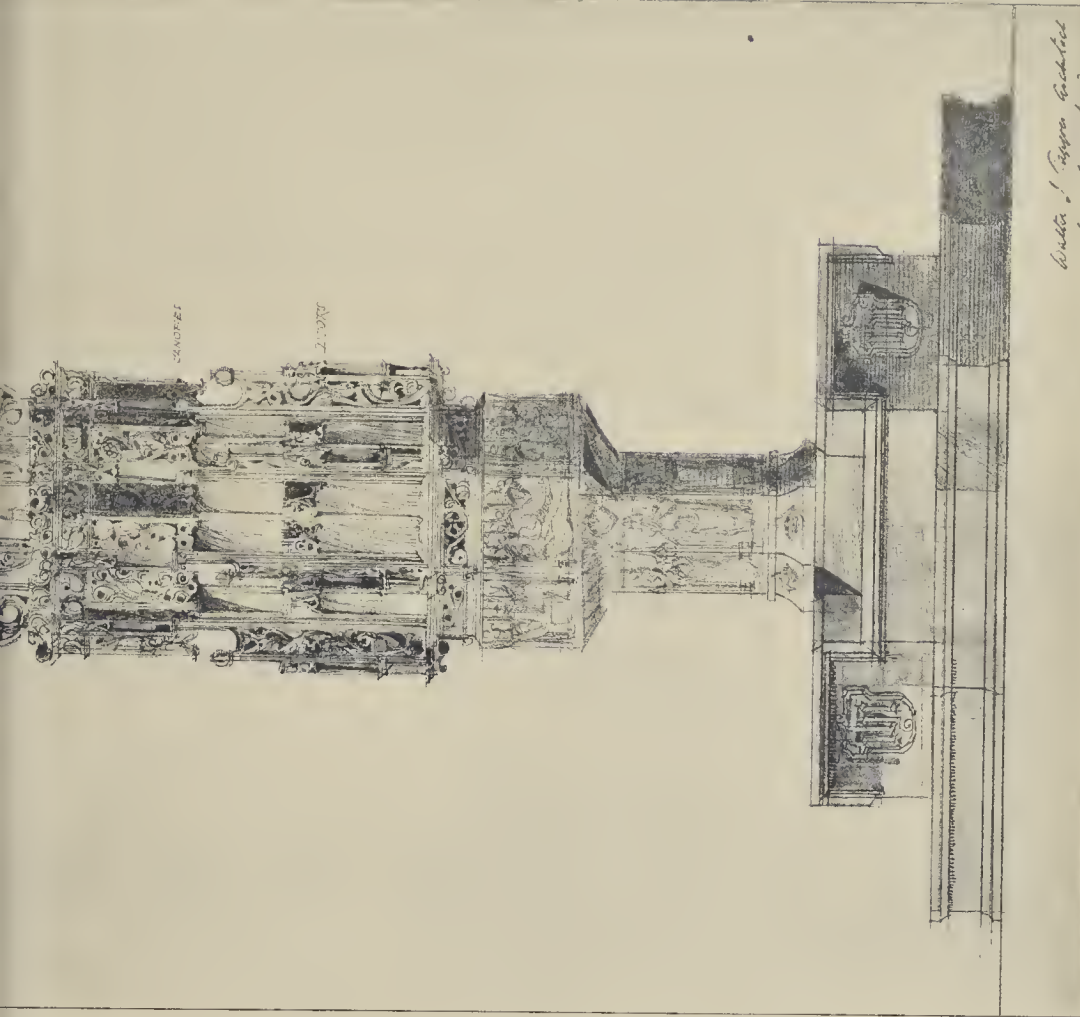
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which will be all the better if carefully laid and polished after the manner known as terrazzo. Tiles and mosaic also make satisfactory floor-surfaces. Such floors are, however, cold, and are not generally approved for bathrooms—at any rate, in houses—although a simple remedy can be found in cork mats or strips of cork carpet or other movable floor coverings. Wood blocks form a suitable surface for bathroom floors, especially if of hardwood wax-polished. The walls of all rooms containing sanitary fittings ought to be faced with impervious materials, which will not absorb organic matter and can be easily kept clean. Glazed bricks are often used for the purpose, with the mortar-joints painted with enamel paint. Glazed tiles are also suitable, or the walls may be finished with Parian or other cement, and afterwards painted. Ordinary lime plaster covered with wall-paper does not form a satisfactory wall-surface. The angles of the walls ought to be rounded; special glazed bricks and tiles are made for the purpose. In hospitals the angles formed by the floors and walls are also rounded off. This arrangement facilitates dusting and sweeping, and reduces the possibility of accumulations of dirt.

GENERAL BUILDING NEWS.

CHURCH, HIGH BROOMS, TUNBRIDGE WELLS.—A church is to be built at High Brooms from plans by Mr. Richard Hill, of London.

CHURCH, OYSTERMOUTH, GLAMORGANSHIRE.—A church is to be built at Oystermouth from plans by Mr. Bruce Vaughan, of Cardiff.

RESTORATION OF EAST CLANDON CHURCH, SURREY.—The old church at East Clandon was reopened recently after restoration. The transept has been restored to its original size, the tower has been strengthened by oak beams, new oak seating has been placed in the church, and an oak pulpit has been erected. Other portions of the work include an oak reredos, a new clock by Messrs. Gillett & Johnston, of Croydon, and an organ by Messrs. Bishop & Sons. The work was carried out by Messrs. Holden, of Cranleigh, under the personal supervision of the Diocesan Architect, Mr. T. G. Jackson, R.A.

REOPENING OF KINGSTON-ON-SOAR CHURCH, NOTTINGHAMSHIRE.—The parish church at Kingston-on-Soar was reopened on the 22nd ult., after undergoing partial rebuilding. Mr. Richard Creed, of London, was the architect, and Messrs. Walker & Slater, of Derby, were the contractors. The bells have been recast by Messrs. John Taylor & Co., of Loughborough.

BEECHROVE UNITED FREE CHURCH, ABERDEEN.—The United Free Church at Beechrove, Aberdeen, was dedicated on the 21st ult. Messrs. Brown & Watt were the architects.

CHAPEL, MAESTEG, GLAMORGANSHIRE.—Memorial stones have just been laid of a new chapel at Maesteg. Mr. T. J. Thomas, of Bridgend, is the architect, and Mr. Francis, Giffach Goch, the contractor.

CONGREGATIONAL CHAPEL, BRISLINGTON, SOMERSETSHIRE.—A Congregational chapel is to be erected at the corner of Wick-lane, Brislington. Mr. Frank Wills is the architect.

CHURCH RESTORATION IN LINCOLNSHIRE.—The parish Church of Kirkby-cum-Ashfordby, near Market Rasen, has been reopened by the Bishop of Lincoln, after complete restoration according to the plans of Mr. R. C. Clarke, architect, of Nottingham.

CONGREGATIONAL CHURCH, OLTON, WARWICKSHIRE.—On the 1st inst. the new Congregational church which has been built upon a site in the Kineton-road, Olton, was opened. The designs for the building were prepared by Mr. J. P. Osborne, the architect. The structure, which is of red brick with white stone facings, includes a tower on the left-hand side of the entrance. The church will accommodate 350 people. A chancel is provided, and there is the usual vestry accommodation. A covered way leads to the schoolroom at the back of the church, and here provision is made for 300 scholars. An underground kitchen, fitted with cooking apparatus, is for tea-parties, &c. The premises are heated by hot water. The church has been built with a view to extensions, and sufficient land has been acquired to enable the schoolroom to be enlarged if necessary. Mr. Turton is the builder. The church has cost 3,500l.

CONGREGATIONAL CHURCH, NOTTINGHAM.—The new Queen's Walk Congregational Church, Nottingham, has just been opened. In the construction of the building the old foundations have been utilised so that the main walls are identical with those of the old building. The organ chamber, however, is placed at the back of the church and is a new building. The front part of the building—the lobbies and space for the future staircase—has been brought forward and is outside the area of the old building. The church has been designed in the perpendicular style, the front to Queen's Walk and side of lobby being built of Dulwell stone rock with dressings of Hollington stone. The sides of the church are faced with pressed bricks, and the roof is covered with American sea-green

slates. Accommodation has been provided for 500 people, and the church has been so designed that an end gallery can be added in the future capable of seating 170 more. Internally the church itself has a length of 79 ft. and a breadth of over 43 ft. The roof, which is an open timber one stained and varnished, is 47 ft. up to the apex from the floor of the church. A feature of the interior is the seating, which is of Californian pitch pine. The rostrum is constructed of pitch pine and mahogany, and is approached by a flight of stairs on either side. Provision has been made for a church parlour, at the rear of the church, 25 ft. by 14 ft., and there are minister's and ladies' vestries, with lavatories attached. The building is heated by means of hot water, low pressure, and the ventilation is on Boyles system, fresh air being supplied by means of brackets fixed round the building. The whole of the buildings are lighted by electricity, this work having been carried out by Messrs. Pearson Bros. The church has been built by Messrs. Green & Sons, and the architect is Mr. Charles Nelson Holloway. The contract amounts to 3,000l.

WESLEYAN CHURCH, WEYBRIDGE.—It is proposed to erect at Weybridge a church, with spire, a manse for the minister, and a lecture hall or Sunday school, with classrooms, and all the necessary adjuncts. The buildings so far erected consist of the lecture hall—which for the present is to be used as a church—with church parlour, stewards' vestry, two classrooms, infants' school-room, cloakroom, kitchen, lavatories, and other offices, and the expenditure incurred is 3,742l. 2s. 6d. The site is half an acre of land in Heath-road, and the present church is of red brick and Bath stone, in the Gothic style, capable of seating 300 people. The architects have been Messrs. Gordon & Gunton, of London, and the builder Mr. W. Greenfield, of Weybridge.

BUILDING IN NOTTINGHAM.—The number of plans deposited from December, 1899, to December, 1900, was 806, and 812 new houses have been certified during the same period. Probably the most important work carried out has been the completion of the Great Central Railway station, which was opened in June. The demolition of the old gaol in St. John's-street has taken place, and the erection of the Corporation electric power station begun on the same site. In connexion with the new electric tramway system the power station at Sherwood has been finished. Very little alteration has been made to buildings in the vicinity of the Great Market-place. Part of the old Moot Hall—an ancient wine and spirit establishment—situated at the corner of Wheeler-gate and Friar-lane, has been pulled down and the work of rebuilding commenced. A considerable amount of property has been reconstructed in and at the back of Wheeler-gate. The jubilee wing—a circular structure has been added to the General Hospital, and extensive alterations have been made in Standard Hill. On the west side of St. James's Church a number of old dwelling-houses have been pulled down and part of King Charles-street taken up—that portion between the church and the hospital—by a new laundry. A rare old landmark, the Tradesmen's Mart, in Lower Parliament-street, has disappeared, and on the site have been erected a cold storage depot and wholesale fruit stores. In St. Mary's Gate Messrs. H. Mallett & Co. are rebuilding part of their warehouse, and in Bridge-street Gate Messrs. Morris & Place, auctioneers, are rebuilding their premises. Alterations are in progress between the Midland Railway Station and Wilford-road Bridge. In addition to new locomotive sheds the Midland Railway Company are erecting a new electric lighting station and for the purpose of erecting a new passenger station have demolished a great amount of household property situated between the present station and Queen's-road. In Meadow-lane, on the east side of the Midland Railway, the foundations have been got in for the new works of the Railway and General Engineering Company, Limited. Quite a number of houses have been built on the old waterworks field near Trent Bridge, and in Rupert-street and Middle Furlong-street, off Wilford-road, additional dwellings have been erected. A building, commenced and practically finished during the year, is the Queen's Walk Congregational Church, which is shortly to be opened. A few other improvements have been carried out in the Meadows district, yet building operations continue steadily. At Lenton building operations have not been as brisk as in many other parts of the city. A number of villas have, however, been built in a commanding situation and at the west side of the Park. The greatest activity has been in evidence at Sneinton, several new streets having been named and houses built off Colwick-road.—*Nottingham Express.*

EXTENSION OF MUSEUM AND ART GALLERY, BRISTOL.—The plans for the extension of the Museum and for the Art Gallery, which Sir William Henry Wills, Bart., is giving to the city, have been prepared by Mr. Frank Wills, in conjunction with Messrs. Houston, of London. The front of the building is designed in the Renaissance style. The museum will contain a central hall, 47 ft. 6 in. by 50 ft. 6 in., and 40 ft. high. On the ground floor will also be two rooms, 62 ft. by 35 ft. and 62 ft. by 33 ft. 3 in. respectively; and two others, each 43 ft. by 29 ft. 6 in. Galleries may conveniently be added if required hereafter. A gallery in the hall leads to rooms which may be used for offices, refreshments,

&c. The Art Gallery will be on the top floor, and will include two rooms, each 64 ft. by 30 ft., two 43 ft. by 30 ft., and another 47 ft. 6 in. by 30 ft. In the basement will be workshops and store-rooms; and lifts are to be constructed to run from the basement to the top of the building.

NEW SCHOOLS, SUBURY.—The opening ceremony in connexion with a new infant school erected by the trustees of the North-street Church Schools, Sudbury, took place recently. The Diocesan Surveyor, Mr. W. M. Fawcett, M.A., of Cambridge, prepared the plans for the new buildings, the contractors being Messrs. George Grimwood & Sons, Sudbury. The new schools are calculated to accommodate 270 scholars. The main infant schoolroom is about 50 ft. by 20 ft. by 13 ft., while there is a large double classroom 20 ft. by 40 ft., divided by a sliding partition. In addition, there are two large classrooms and a lobby. The whole of the walls have a dado, 4 ft. high, with a chocolate-coloured border of salt glazed bricks.

TOWN HALL, TAUNTON.—Revised plans of the proposed Town Hall for Taunton have been submitted to the joint committee of the Market Trustees and Town Council. The architects, Messrs. Samson & Cottam, have been instructed to prepare an estimate of the cost.

ECCLESBOURNE - ROAD SCHOOLS, THORNTON HEATH.—These schools have just been completed for the Croydon School Board. The present accommodation is for 1,200 children—400 boys, 400 girls, and 400 infants, with room for future extension. The infants' school is a one-story building and comprises a central hall 60 ft. by 25 ft., seven classrooms, two caprooms and entrances, with a teachers'-room, which will be available as a committee-room. The boys' and girls' school is a two-story building, the boys on the ground floor and girls above. Each department comprises a central hall 70 ft. by 30 ft., with a class for fifty at each end, and five classrooms for sixty each, two caprooms, a teachers'-room, store, and two staircases, and the upper floor is approached by two staircases, so that there is always an alternative exit in case of emergency. There is a lock-up store with sink and hot and cold water for the use of the caretaker in each school; also a store for bicycles. The upper floor is constructed of steel girders and concrete, thus being fire and sound resisting, and permits of solid wood floors, formed with 1½ in. pitch pine blocks, being used throughout all the schools. The external walls are built hollow, 16 in. thick, faced externally with red Leicestershire bricks and Derbyshire stone dressings; the roofs being covered with red Staffordshire tiles. Instead of the usual type of lavatory basin in the cap-rooms, a marble lavatory trough of special design is provided, which is cleaner and more economical. Incandescent gas lighting is provided by a special form of burner introduced by Messrs. Wm. Sugg & Co., of Westminster. The heating is by low pressure steam, working at about 2 lbs. pressure, and is generated from two boilers in a basement under the large school. Messrs. Korting Bros., of London, are responsible for this work and guarantee, under a contract, that the temperature can be raised 40 deg. Fahr. above the outside temperature. There is a coil of gilled pipes in each room with a valve to regulate the amount of heat, and at the back of each coil a fresh-air inlet is provided with regulating shutter. On the opposite wall to the coil a foul air extraction flue is provided with a valved grating fixed at the floor level, thus ensuring an equable temperature throughout the room. The builders' contract amounts to 15,534l., which works out at barely 13s. per head, and is within the amount specially allowed by the Board of Education for the erection of those premises and works in connexion therewith. Messrs. Wm. Smith & Son of Croydon, are the builders, and Mr. T. W. Tester has acted as clerk of works. Under a separate contract, amounting to 732l., the Bennett Furnishing Company, of London, have supplied all the furniture, which is executed in a Canadian hard wood called orham. The architect is Mr. A. Carter Pegg, of Thornton Heath.

MASONIC TEMPLE, EDINBURGH.—No. 75, Queen-street, Edinburgh, has been converted into a masonic temple. Mr. P. L. Henderson was the architect.

TOWN HALL, ENNISKILLEN, CO. FERMANAGH.—The new Town Hall at Enniskillen has just been completed. Messrs. A. Scott & Son, of Drogheda, were the architects.

CONSERVATIVE CLUB, BRINHAM, DEVONSHIRE.—The new Conservative Club building at Brixham was opened on the 26th ult. The building is on a site adjoining the Market Hall, and was erected by Messrs. Hazelwood, of Brixham, from plans by Mr. E. Richards, of Torquay.

SCHOOL, EDINBURGH.—The site of the new Board school, the plans of which were approved at a recent meeting of Edinburgh School Board, faces Ashley-terrace, North Merchiston, and contains one and a quarter acre of ground. The main feature of the plan is a central hall both on the ground and on the first floor, with classrooms grouped round them on each floor, the ground floor being devoted to the infant department, and the first and second floors to the juvenile department. The second floor contains, besides the ordinary classrooms, a combined workshop and cookery classroom and gymnasium. The classrooms contain an

average number of sixty pupils, and there being twenty-seven classrooms in all, accommodation is provided for 1,580 pupils. The school has been designed in a simple treatment of English Renaissance, the windows lighting the juvenile hall on the first floor being marked by semi-circular heads. An ornamental belfry surmounts the central tower. The building will be heated by means of hot-water pipes on the low-pressure system. Ventilation is obtained by means of electrical fans extracting the vitiated air from all the rooms. Mr. Robert Wilson is the architect.

FRINGLES MEMORIAL UNITED FREE CHURCH, FOCHABERS, N.B.—This new edifice has just been opened. It has been erected from designs by Messrs. D. & J. R. McMillan, architects, Aberdeen. The tower and spire at the corner is about 105 ft. in height, supported by heavy buttresses carried up at the angles from the base, and finished off at the four corners with turrets. In the main gable there is a large tracery window. The main entrance doorway is situated in the tower. The church will accommodate 450 persons, but by extending an end gallery at a future date, the accommodation may be considerably increased. At the rear of the church is a hall to accommodate 150 persons, with a session-house adjoining, which can on special occasions be thrown into the hall by the opening of folding doors. Behind the pulpit is an apse where an organ may be erected. The roof is circular in form, lined with wood. The pews and inside finishings are of pitch pine. There is also the usual vestry accommodation and a tea kitchen. The cost of the completed structure is expected to be about £3000.

RE-OPENING OF PARISH CHURCH, SEATON, DEVONSHIRE.—The parish church of St. Gregory, Seaton, was re-opened recently after renovation, &c. The work has included the substitution of an open timbered roof for the old lath and plaster ceiling, and the erection of a new pulpit of carved oak, the work of Messrs. Harry Hems & Sons. A new font, with a bowl of Beer stone, is being made by Messrs. Hems. The work was carried out under the supervision of Mr. Strawbridge, of Taunton, by Mr. H. Abbot, of Seaton.

SANITARY AND ENGINEERING NEWS.

CHESTERTON RURAL DISTRICT SEWERAGE.—Colonel Marsh, R.E., an Inspector of the Local Government Board, held an inquiry recently at Cherry Hinton, Cambridge, concerning the application of the Chesterton Rural District Council for sanction to a proposed loan for works of sewerage and sewage disposal. The engineers' estimate of the cost of the works was £1,650. The District Council were represented by Mr. Bartley Dennis, barrister, London.

Mr. H. Bertram Nichols, consulting engineer, of the firm of Messrs. Beesley, Son, & Nichols, of Westminster, gave evidence for the District Council, also Mr. Frank Waters, of the firm of Messrs. Waters & Worrall, of Cambridge, engineers for the scheme. The scheme was opposed by the Town Council of Cambridge, also the Cambridge Waterworks Company. Mr. Strachan, engineer, of Westminster, gave evidence on behalf of the Water Company.

SEWER VENTILATION, BIRKENHEAD.—A monthly meeting of Birkenhead Town Council was held on the 2nd inst. in the Birkenhead Town Hall when Alderman Singleton, in moving the minutes of a special joint meeting of the Health and the Road and Improvement Committees, in reference to the ventilation of sewers, said the committee had come to the conclusion that ventilation should be provided by upcast ventilation instead of surface gratings immediately in case of streets 30 ft. in width or under, and as occasion arose with wider thoroughfares. The committee were unanimously of opinion that surface gratings should be closed at once in such narrow streets, as it was there, if anywhere, that danger arose from sewer-gas, whereas in wide areas there was little, if any, danger. It was not meant, of course, that the gas should be extracted from the sewers, but merely to provide a vent which would permit the escape of gas whenever pressure occurred, and thus prevent its finding its way into the houses. The proceedings were adopted.

STAINED GLASS AND DECORATION.

WINDOW, ST. CHAD'S, HEADINGLEY.—A stained-glass window has just been erected in St. Chad's Church, Far Headingley, Leeds, by Mr. John Kirk, of Headingley, in memory of his wife. The window, consisting of two lights, illustrates the coming to the tomb of the three Maries on the morning of the Resurrection, and is a copy of the altar-piece in Molde Church, Norway. The work is from the studio of Messrs. Powell Brothers, of Leeds.

MEMORIAL WINDOW, TRINITY CHURCH, NOTTINGHAM.—A stained glass memorial window, the work of Messrs. Henton, Butler, & Bayne, of London, has been placed in the south-east wall of the church of Trinity Church, Nottingham.

MEMORIAL WINDOWS, ASHILL CHURCH, NORFOLK.—Two memorial windows have been placed in St. George's Church, Ashill. The east window is in memory of the Rev. E. Edwards, at one time a rector of the parish. The other window is in memory of the late rector the Rev. C. W. N.

Custance, and is in the south side of the chancel. The new stonework in the windows was designed by Mr. A. H. Rowe and executed by Messrs. Corfield & Gaymer, of North Walsham. The glass was by Messrs. Lavers & Westlake, of London.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The firm hitherto known as that of Messrs. E. & H. Lumley, last agents and auctioneers of 27, St. James's-street, has been registered as a limited company under the style of "Lumleys, Limited." The constitution of the firm remains unchanged; Mr. Henry Lumley will be Governing Director and will give the same attention to the business as formerly.

—Messrs. Hayward Bros. & Eckstein, of Union Iron Works, Borough, have purchased the goodwill, patterns, plant, &c. of the Alliance Ventilating Company, late of 17, Bethnal Green-road. The firm of Ewart & Son (346 to 350, Euston-road, N.W.), sheet metal workers and copper roofing contractors, have converted their business into a limited liability company, and in future will be known as "Ewart & Son, Limited."

DISTRICT SURVEYOR.—BERMONDSEY.—Mr. T. Barnes Williams has resigned his appointment as District Surveyor for the district of Bermondsey, St. Mary Magdalen and St. John; St. Olave, and St. Thomas, Southwark.

ST. PAULS, COVENT GARDEN.—The Communion plate and the registers of this church were saved from the fire of 1785, but the latter have never again been entered. We are informed that this has now been done as far as the marriages are concerned, and those of the baptisms and burials will be completed shortly. The work is being prepared by Mr. H. Farrar, assisted by Messrs. T. C. Black and Harold and Percy Werwick, who have presented cases as covers for the slips. The registers of burial include some celebrated names, among those of Grinling Gibbons, Thomas Arne, and Macklin.

STREET REFUSE IN THE CITY.—The Corporation have for some time past been considering the question of dealing with dust and refuse from the City, and, among other things, the practicability of generating electricity from steam raised by burning the refuse. Mr. D. Ross, the City Engineer, reporting to them on the subject, states that last year 74,621 loads of refuse were removed from the City to Lett's Wharf, Lambeth, near Blackfriars Bridge, the lease of which expires in 1909. About 60 per cent. of the house and trade refuse is cremated, but the street sweepings, slop, and market refuse are shot into barges and removed daily. The Corporation, having permitted two electric lighting companies to obtain powers to supply electricity for lighting and other purposes, could only generate electricity for their own purposes or for street lighting. They were in a totally different position to other local authorities who are supplying electricity in their various districts and who are cremating their refuse and utilizing the power generated therefrom in connection with their electricity works. It was extremely doubtful whether the house and trade refuse could be profitably dealt with by cremation, as it consisted principally of paper, straw, and packing materials of very little calorific value, exceedingly bulky and difficult to manipulate. Although from a sanitary point of view cremation was preferable to any other method of dealing with the refuse, mature consideration leads Mr. Ross to believe that, having regard to the difficulties of obtaining a suitable site in the City and the expense thereby entailed, and to the difficulties that would arise in working any apparatus that might be erected without being stopped by legal proceedings, the objections to this course were almost insuperable, and in his opinion it would be better to barge the refuse direct into the country from the City than deal with it there. Mr. A. A. Voysey, the Electrical Engineer of the City, has also made a report to the Corporation on the subject. The Streets Committee, on these reports, have advised the Corporation to barge the dust and refuse into the country and to obtain some suitable site for the purpose. The question will be decided on the re-assembling of the Corporation after the vacation.

PAVING MATERIALS IN ABERDEEN.—The quantity of granite sets used for paving purposes in the city during the past twelve months is the smallest for several years, and shows a great falling-off compared with 1899, when the quantity of paving blocks laid in Aberdeen amounted to 1,070 tons. Of this quantity 817 tons were required for the paving of Great Northern-road, and that accounts for the exceptionally large quantity used in 1899. Last year the total quantity reached only 1,181 tons, which is certainly a very small tonnage for a city like Aberdeen. There is also a considerable decrease in the quantity of rubble used for street purposes, which amounted only to 4,600 tons, and shows a falling-off to the extent of 3,021 tons, or nearly one-half, but the quantity was greater than that of 1897. Of road metal 20,754 tons were used, which is nearly the same as 1899. In granite kerbing there has been a decrease of more than one-half, the quantity being 3,422 lineal yards as against 7,467 lineal yards, a decrease of 4,045 lineal yards; but in granite pavement an increase of 21 square yards falls to be recorded, the quantity being

890 square yards, compared with 643 square yards in 1899. Concrete pavement shows a decrease of 10 square yards, the figures being 6,081 square yards and 6,074 square yards respectively. One of the most interesting features in connection with the paving of the city is the large increase in the use of adamant pavement. In 1899 the quantity laid amounted to 1,682 square yards, while this year it has risen to 11,425 square yards. In the course of last year 10,737 square yards of tar macadam were laid, while in 1899 the amount was 9,026 square yards, showing an increase of 6,811 square yards. While this large quantity of tar macadam has been laid down, a very large quantity has been scraped up. In some of the thoroughfares where tar macadam has been used, tons upon tons of stuff have been swept, scraped, and washed away in the shape of black mud and gravel.—*Aberdeen Journal.*

THE ENGINEERING TRADES IN 1900.—According to Messrs. Matheson & Grant's half-yearly report the year 1900 has not been quite so profitable to manufacturers as 1899, when the maximum prices were obtainable without that increase in the cost of fuel, material, and labour, which has since taken place. It is to the economies obtained by the full employment of the iron works, as much as to high prices, that manufacturing engineers have owed their profit, and it will be to a lessened demand that a reaction will be due. In some branches this time has already arrived, for though contracts in hand keep most of the works busy, new orders are not so abundant as in the spring. There is no longer difficulty in obtaining prompt delivery of material, iron and steel, which in the previous year was selling at 65s. per ton, alike in Scotland and Middlesborough, had risen to 70s. and 75s. respectively in April, the north country iron being thus dearer than Scotch instead of being cheaper as in normal times. Cargoes from America arrived in this country during the spring and summer at lower prices than those which had a continuance of such imports was threatened; and as, meanwhile, the price of coke had risen to an unprecedented level, the owners of blast furnaces in this country found difficulty in selling their product on remunerative terms. The famine in coke was ended; the price fell during the summer and autumn as the demand for pig iron slackened, and at present the prospects of the iron masters are rather gloomy. Finished iron has followed much the same course. Ordinary bars which were saleable at 101. to 111. per ton in April, now, by a succession of reductions, stand at only at 81. "Marked bars," bearing well-known brands, have been least affected, and "Best Yorkshire" iron remains at the same high price to which it was raised a year ago. The heavy steel trade has had to meet Continental and American competition. Owing to the great demand during the summer and to the concert among manufacturers the prices of English rails reached 77. 10s. per ton for heavy sections, and in consequence several large purchases for the Colonies and India, which in ordinary course would have been supplied here, were bought from America. The present price of heavy rails is about 61. per ton, and there has been a corresponding fall in the values of the structural steel used by ship and bridge builders.

BUILDING INSPECTORSHIP.—Mr. Alfred T. Mills, Associate Sanitary Institute, Sanitary Inspector of the Borough of Bethnal Green, has been appointed Building Inspector to the Hornsey District Council.

THE TIMBER MARKET IN 1900.—In Messrs. Foy, Morgan, & Co.'s annual wood report for 1900, it is stated that the volume of the import last year was very great, being largely in excess of both 1898 and 1899, and practically the same as in 1897, while in value, owing to the exceptional rise in prices during the last two years, the past year surpasses even that of 1897 by several millions of pounds sterling. But while this is true of the totals, the facts that have most importance for the soft wood trade are only to be discovered from an examination of the details, and it would then appear—after setting aside the statistics of hewn wood (which include, beside timber and balks, such items as pit-props, round wood for pulp, &c.), and thus confining attention to the main importation of deals, battens, boards, and floorings—that there has been no difference of any practical importance between the quantities imported during the last three years either from Russia or Sweden or Norway or Canada. The quantity imported during 1897 from the same countries appears to have been in the case of Russia and Scandinavia 4 per cent. to 5 per cent. and in the case of Canada 15 per cent. larger than in any of the last three years. The only exporting country, and that by far the least important among our sources of supply, which has increased its shipments here is the United States, and inasmuch as its chiefest product, sawn pine timber, is used as a substitute for the hewn fir for the most part shipped from Germany the increase in such supplies would appear to be nominal only, and largely explainable as a simple transfer in our Customs' return from one category to the other. That portion of the import, then, which concerns the building, joinery, packing case, and allied trades has by no means tended to increase, but, on the other hand, has shown a marked diminution. In 1897 the face, however, of the great visible increase in stocks now held in such places as London, Hull, Hartlepool, Newcastle, Sunderland,

Cardiff, Swansea, Dublin, and Belfast, the statistics seem opposed to obvious facts, but the explanation doubtless lies in the conditions regulating the supply of tonnage. The establishment of liners, the gradual disappearance of sailing vessels and small steamers, besides the preference given particularly when freight is high to large ports, especially when also coal ports, where good despatch and low expenses can, as a rule, be relied upon—all serve to concentrate importation into the larger centres, which thus are made to serve a more extended area to the detriment of the smaller ports, handicapped as these are by want of tonnage facilities. The consumption during the past year has not continued on its previous satisfactory level. A twelvemonth ago some tendency of slackening was observed, and this has increased during the year, under the screen of high prices, so as to show a total decline of about 10 per cent. Whether continued or not, the consuming power of the market is even now brought down to within 5 per cent. of what it was in 1897, so that, comparing prices ruling then with those current to-day, it becomes a critical problem whether the present conditions of supply and demand are such as to support the scale of prices now in vogue.

NEW SURVEYING INSTRUMENTS.—Amongst the more recent surveying instruments introduced by Messrs. W. F. Stanley & Co., Limited, of Great Turnstile, W.C., some improved levels and theodolites are worthy of notice. The "New Model" level is an excellent instrument with a very rigid stand and a tribrach stage permitting the level to be used on a wall without the legs. An improved "Quick Setting-up" level has a head which combines the advantages of the Hoffman levelling joint and the tribrach system. This method of construction allows a considerable range of adjustment, so that the instrument can be used on very uneven ground. It can be rapidly set up, and may be employed without the legs if necessary. Each of these levels is supplied either with or without a prismatic compass, which, in the opinion of some surveyors, is an unnecessary addition, for the reasons that levelling and traversing cannot profitably be conducted simultaneously and that the level does not afford a particularly suitable mount for such an adjunct. Stanley's theodolite is a most serviceable combination of level and clinometer, for employment when the ordinary type of level would be at serious disadvantage, as, for instance, on sloping ground. The new model railway theodolite, as its name implies, is designed specially for railway engineers; it is a compact and steady instrument, levelled on the tribrach system, and is fitted with a patent locking-plate, making the instrument available for use on masonry or ironwork, as well as upon the stand. Stanley's new transit theodolite is particularly noticeable for solidity of construction, and it includes other improvements as to details, which should be conducive to additional accuracy of the work performed.

CARPENTERS' COMPANY.—We may draw the attention of workers in wood to the important exhibition of the Carpenters' Company to be held in June this year, of which an advertisement was found in the present issue. We gave a general sketch of the scheme of the exhibition in a "Note" in our issue of July 7 last year, when the circular regarding the exhibition was first sent to us.

A NOTABLE CHIMNEY-SHAFT.—Although surpassed in height by several chimneys in this country, the new shaft of the Metropolitan Street Railway power station, New York, is of greater diameter and power than any similar structure in the world. Its height is 255 ft., and the internal diameter 22 ft. from bottom to top. The chimney is designed to serve a battery of eighty-seven steam boilers, each of 800 h.-p. maximum, equal to a total of nearly 70,000 h.-p. Preliminary borings on the site indicated that the first 15 ft. in depth consisted of heterogeneous material, and that below this there were beds of sand gradually becoming coarser and more like hardpan until the depth of 75 ft. was reached. Below this level blue clay extends to an unascertained depth. After the necessary excavations had been made, piles 45 ft. long were driven into the coarse sand, to afford a sufficient bearing for the concrete foundation, the piles being spaced about 30 in. apart, centre to centre. The concrete bed is 20 ft. thick, and covers an area of 88 ft. square. Ordinary brick was used for the greater part of the chimney, which has two shells. The inner one is only strong enough to support its own weight, including that of the fire-brick lining; the other is designed to carry its own weight and the horizontal wind load, taken in this instance at 50 lbs. per ft., or 5 lbs. less than the load usually assumed by British engineers. For the purpose of increasing stability and stiffness, counterforts, or ribs, were built into the inner surface of the outer shell. These extend to within about 2 in. from the inner shell, and thus form guides for its movement during expansion or contraction. Flues from the boilers enter from opposite sides on each of the three floors on which the boilers are carried, and there is a baffle-wall in the middle of the shaft reaching a little way above the uppermost inlet flue, so that the products of combustion may be directed upwards, and be prevented from interfering with the discharge from the flues on the opposite side of the chimney. An internal lining of fire-brick extends to about 50 ft.

above the highest flue opening. The structure is finished with a cast-iron cap, made in sections and bolted together when in position.

OPEN SPACES.—The Executive Committee of the Commons and Footpaths Preservation Society have instructed their solicitor to draw up a report upon the private Bill (not yet thirty in number) which are prepared for next Session of Parliament, and which would encroach upon open spaces, village greens, and commons to the extent of taking an aggregate of 1,200 acres of common land for new waterworks and 350 acres for tramways and railways.—The Metropolitan Public Gardens Association have under consideration the making of schemes for the acquisition and the laying-out of Hoxton-square, Leyton-square, S.E., and certain vacant lands at Hackney, Bethnal Green, Hampstead, and elsewhere in London. During the eleven months January–November, 1900, the Association's income was less by about 700*l.* than during the corresponding period in 1899.—The London County Council have agreed, in consideration of a sum of 5,600*l.*, as estimated by their Finance Committee, to transfer to their Parks Committee the charge of the portion of the Falcon-court, Southwark, area, recently cleared in pursuance of the Housing of the Working Class Act, 1890, for the purpose of an open space, and to lay out and maintain the ground. The Council have further resolved to expend 7,000*l.* in buying the garden ground of Albert-square, Commercial-road, E.; and to contribute one-half of the cost of the acquisition by the Lewisham District Board of about 8 acres, known as the Home Park estate at Lower Sydenham, subject to a maximum contribution by the Council of 2,800*l.* and to an agreement by the District Board to retain the ground for the public benefit and for recreational enjoyment in perpetuity. The Council anticipate that the laying-out of the Archbishop's Park at Lambeth will be completed in the course of five or six months; there will be a new entrance from Carlisle-place. The total cost of the works is computed at nearly 5,000*l.*—The Enfield District Council propose to purchase for 7,000*l.* a portion, being rather more than 13 acres, of the Chase Side House estate, towards which Mr. Bevan and Mr. J. W. Ford contribute 500*l.* apiece. At Leeds, the City Property Committee have agreed to recommend the acquisition for 35,000*l.* of the Harehills Park estate, about 32 acres, and for 14,000*l.* of another site in Harehills-lane.

THE LABOUR MARKET IN THE COLONIES.—The January Circular of the Emigrants' Information Office states that in New South Wales the break-up of the drought last year has much improved the prospects of all kinds of labour; but there were throughout the year large numbers of unemployed in Sydney, many of whom were provided with work by the Government Labour Bureau at quarrying, railway construction, &c., the ordinary wage being 7*s.* a day. The demand for mechanics is not large, but competent men can generally get work without much delay; they should have some money with them on landing. The building trade in Sydney has been unusually busy. At Newcastle also there has been a demand for good turners, blacksmiths, fitters, ironmoulders, carpenters, &c. in Victoria there is no demand for mechanics or labourers, unless they are specially skilled, and bring a little money with them. In South Australia there is practically no demand for more mechanics in the towns, but a skilled hand can generally find employment after looking about for a little. With regard to Western Australia, it should be remembered that the population of the colony, though it has rapidly increased, is still small, and that therefore the demand for all kinds of labour is necessarily limited. Official returns for the quarter ending September 30 last show that the supply of mechanics is sufficient everywhere except at Katanning and Yilgarn, and for good men in the building trades at Perth. In Tasmania mechanics at Zeehan, Queenstown, and Gormanston, on the west coast, and in the surrounding districts, are well employed; good fitters can generally get work, but otherwise the labour market there is on the whole well supplied with men. The last reports from New Zealand show that there was plenty of work there except in the meat-freezing works. Good boiler-makers have been in demand at Christchurch. There has been a great demand at Dunedin for a limited number of good stone-masons, and several openings for a few first-class fitters and turners. At Invercargill, carpenters, bricklayers, and stone-masons have been especially busy, and men have been hard to get, even at an advanced rate of wages. Persons are warned against going to South Africa at present in search of professional or manual work, unless they have ample private means to meet the very high cost of living. They will not as a rule be allowed to proceed up country. There are already large numbers of persons in South Africa at the present time who are out of employment.

GLASGOW ENGINEERING CONGRESS, 1901.—This congress is to be held in Glasgow in the first week of September, 1901, and will meet in the University Buildings. Papers will be read on two or three days and excursions to works of engineering interest and social gatherings will be arranged. Lord Kelvin has consented to act as Honorary President, and the President and Council of the Institution of Civil Engineers have consented to the nomination of the

President of that Institution as President of the Congress. Among the subjects proposed to be treated are—Sewage and Sewage Disposal; Streets (including questions of paving and cleansing, the removal of snowfall from streets, traffic regulation, &c.); Light Railways and Tramways; Street Lighting; Removal of House Refuse; Utilisation of Dust Destruction for Power Generating; Smoke Abatement; Housing of the Working Classes; and Superannuation.

THE SHANNON MONUMENT, WALTON.—We learn that Mr. F. J. Williamson, of Esher, has been commissioned to carry out a restoration of the monument, designed and sculptured by Roubilliac, erected in Walton Church, Surrey, in memory of Richard Boyle, second and last Viscount Shannon, who died in December 20, 1740.

LEGAL.

EMPLOYERS' LIABILITY ACT.

QUESTION AS TO WHO WAS THE EMPLOYER.

AT Brompton County Court recently, before Judge Stomton, Mr. John Gilbeart, builder, 11 and 12, Chester-street, Belgrave-square, S.W., was sued, under the Employers' Liability Act, by John Spanner, jun., Battersea, the claim being in respect of personal injuries sustained by the plaintiff owing—it was said—to negligence for which the defendant was responsible. John Spanner, sen., father of the plaintiff, brought a similar action against the same defendant.

Mr. G. Aplin Nichols, solicitor, appeared for the two plaintiffs; and Mr. J. Jones, counsel, defended the case of the son who was taken first.

The plaintiff stated that on May 4 last he was helping his father to fix linacrusta to a ceiling at 50, Eaton-place. In order to reach the ceiling the defendant provided them with trestles upon which scaffold boards were placed. While standing on one of these boards and pressing the linacrusta up to the ceiling, a tread of one of the trestles suddenly gave way, and both he and his father fell a distance of some 5 ft. to the ground. He was taken to St. George's Hospital, and was unable to do any work for five weeks. He found that one of the trestles of the tread that gave way had been sawn too deeply, and he thought that this defect might have been discovered by putting a weight upon it, or placing the blade of a knife in the joint.

Cross-examined: Neither he nor his father examined the trestles before they went on them.

John Spanner, sen., the father, said that he did not put in a price for the work in question, but reckoned up the number of hours, and charged what he considered reasonable.

Arthur Dyer, another employee, maintained that the trestles were defective in the making, owing to the saw running too deeply when the tenon was cut. Trestle-makers generally tested their goods before sending them out for use.

Mr. Jones submitted that the plaintiff was not in the employ of the defendant at the time of the accident, and so could not recover under the Act. There was no evidence to show that Mr. Gilbeart exercised any control whatever over the two men. They came to work when they liked, and charged practically what they liked.

The Judge: But was there a contract?

Mr. Jones: There was a contract, of course, to do the job. The learned counsel went on to refer to the case *Hunt v. Moullin*.

Mr. Nichols submitted that the elder plaintiff was in the employ of the defendant, because he had entered into a contract to work for him.

Mr. Jones replied that it was the son's case that they were then dealing with, and that the young fellow could not be held to be in the employ of the defendant, for he admitted being engaged in assisting his father.

The Judge: With regard to the son, I shall non-suit.

Mr. Jones offered to forego all costs if the case brought by the senior plaintiff were struck out.

Mr. Nichols consulted with his client, and afterwards agreed to the case being struck out as suggested by the defendant's counsel.

MEETINGS.

FRIDAY, JANUARY 11.

Institution of Civil Engineers (Students' Meeting).—Address by Mr. Williford Airy, B.A., on "Geodesy." 8 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. John McGloughlin on "Constructional Work" (at No. 47, Great Brunswick-street). 4.30 p.m.

Glasgow Architectural Craftsmen's Society.—Professor Gourlay, B.Sc., on "A Tour in Germany, Switzerland, and Italy," with lime-light illustrations. 8 p.m.

SATURDAY, JANUARY 12.

Dundee Institute of Architecture.—Mr. R. S. Douglas on "Architectural Decoration—(1) as Clothing; (2) as Structural." 8 p.m.

MONDAY, JANUARY 14.

Surveyors' Institution.—Adjourned discussion on Mr. R. E. Middleton's paper on "The Future of the London Water Supply." 8 p.m.

Institution of Mechanical Engineers (Graduates' Meeting).—Professor J. A. Ewing on "The Structure of Metals," illustrated by lantern slides. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. J. Liberty Tadd on "Elementary Art Education." 8 p.m.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Bridge, Balgig Burn	Dunoon (N.B.) Commissioners	Mr. Mackintosh, Civil Engineer, Dunoon	Jan. 15
Filter Beds, &c., Acomb Landing	York Waterworks Company	W. H. Humphreys, Waterworks Offices, Leulahl, York	do.
Hotel, Barrow-in-Furness	Wolverhampton Corporation	Harrison & Co., Architects, 36, Abbot-road, Morecambe	do.
Tranways (4 1/2 miles)	Cuckfield R.D.C.	J. W. Bradley, Borough Engineer, Town Hall, Wolverhampton	do.
Hospital, Burgess Hill	Caerphilly U.D.C.	G. T. Bille, Architect, 35, Parliament-street, S.W.	do.
Workshops and Five Houses, Boothtown, Halifax	Kawarasan U.D.C.	R. Berry, Architect, Halifax	do.
Streets Works, Commercial-street, &c.	Lewisham Borough Council	A. O. Harper, Surveyor, Council Offices, Caerphilly	do.
Cast-iron Sewage Main	Peplar Borough Council	W. J. Petch, Council Offices, Kawmarsh	do.
Sewerage Works	Burley Corporation	Surveyor's Department, Town Hall, Catford, S.E.	do.
*Kerbing and Tarpaving	Leeds Corporation	Boro Elec. Engr., Electricity Works, Glaucus-st., Bromley-by-Bow	Jan. 16
Electric Crane	Leeds Corporation	J. F. Leather, Gas Engineer, Gas Works, Burley	do.
Furriers, Roof, &c., at Gasworks	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Wrought Iron Fencing, &c., Jowett's Park	Leeds Corporation	St. M. Grove, Civil Engineer, Town Hall	do.
Boundary Wall, Grove Hall	Aberdeen District Committee	Jenkins & Marr, Civil Engineers, Aberdeen	do.
Water Mains, &c., Culls	Ebbw Vale (Mon.) U.D.C.	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Shop, &c., Thornton-road, Huddersfield	Preston (Lancs) Corporation	Carter & Co., Market-hill, Cambridge	do.
Cast-iron Pipes, &c.	Leeds Corporation	T. Hughes, Council Offices, Ebbw Vale	do.
Bandstand, &c., North-street	Leeds Corporation	City Engineer, Municipal Buildings	Jan. 17
Paving Works, Ashton	Leeds Corporation	Borough Surveyor, Town Hall, Preston	Jan. 18
Additions to shops, Salford	Leeds Corporation	E. C. Evans, Town Hall, Salford	do.
Two Villas, Northland-road, Epsom	Leeds Corporation	R. V. Doye, Architect, strand, Londonderry	do.
Council Chamber, Offices, &c., Newport	Leeds Corporation	W. Tanner, Surveyor, Newport, Mon	do.
Granite Setts, &c.	Leeds Corporation	A. Durbie, Civil Engineer, Council Chambers, Gourock	do.
Thirty-two Houses, South Bank, York	Leeds Corporation	G. O. Beadle, Redcar-road, South Bank	Jan. 19
Additions to St. Saviour's Church, Weston-super-Mare	Leeds Corporation	White & Fry, Architects, Weston-super-Mare	do.
Hartshill Stone	Banbury Town Council	N. B. Dawson, Civil Engineer, Town Hall, Banbury	do.
Church, near Todmorden	Banbury Town Council	Borcham & Murton, Surveyors, 24, John-street, Sunderland	do.
*Fencing	London County Council	Parks Department, 11, Regent-street, S.W.	Jan. 21
Cast-iron Socket Pipes	London County Council	Borough Surveyor, Council Hall, Rotherham	do.
Street Works	London County Council	W. J. Newton, Civil Engineer, Town Hall, Accrington	do.
Retorts, Fire-clay, &c.	Bury (Lancs) Corporation	H. Simmonds, Engineer, Gasworks, Bury	do.
Villa, Glasgow-road, Perth	Mr. Boyd	J. Fraser, Civil Engineer, Liveness	do.
Bridge Works, Stronway, N.B.	Lewis District Committee	J. Wood, Engineer, Bridge-street, Todmorden	do.
Weaving Shed, Walden	Pioneer Mill Co., Ltd.	Chief Surveyor, Council Offices, Chelmsford	do.
Road-making Plant, Iford	Essex County Council	E. A. Whitaker, Architect, 1, Great-st.-buildings, Basinghall-st.	do.
*Laying-out, &c., of Cemetery at Uplminster	Essex County Council	Borough Engineer, Plymouth	do.
*Rails, Fish Plates, &c.	Essex County Council	Council House, East Hill, Wandsworth	do.
*Making-up Roads	Essex County Council	S. J. Newman, Architect, 3, Tunusoy-buildings, Branksome	Jan. 22
Additions to Council Buildings	Essex County Council	E. M. Whitaker, Architect, 1, Great-st.-buildings, Basinghall-st.	do.
Road Metal	Essex County Council	Engineer, 712, High-road, Tottenham	do.
Sewers	Essex County Council	S. Mather, Civil Engineer, Ewell-road, Surbiton	Jan. 23
Public Mortuary, Road Works, &c.	Essex County Council	G. T. Wilson, Architect, 121, Durham-rd., Blackhill, Co. Durham	do.
Additions to Hospital, Langley Park	Essex County Council	A. Allan, Engineer, Gasworks, Nelson	Jan. 24
Gas Purifying Plant, Brierfield	Essex County Council	H. Edwards, Civil Engineer, Town Hall, Remington-greys, S.E.	do.
Jarrah Timber	Lambeth Borough Council	Thomson & Sandilands, Architects, Glasgow	Jan. 25
Hospital, Stobhill, Springburn	Lambeth Borough Council	County Surveyor, County Hall, Lewes	do.
*Sessions Court, &c.	Lambeth Borough Council	See Advertisement	do.
*Coast Guard Buildings at Dunensis, near Falmouth	Lambeth Borough Council	do.	do.
*Coast Guard Buildings at St. Mawes, near Falmouth	Lambeth Borough Council	do.	do.
Waterworks, near Arundel, Sussex	Lambeth Borough Council	H. Howard, Engineer, Town Offices, Littlehampton	Jan. 26
Schools, Hall, &c., St. David's, Pembroke	Lambeth Borough Council	D. E. Thomas, Architect, Haverfordwest	do.
Gas Engines and Pumps	Lambeth Borough Council	Deputy Borough Engineer, Town Hall, Croydon	Jan. 29
Fire Station and Cottage	Lambeth Borough Council	W. Harston, Surveyor, High-street, Dartford	do.
*Additions to Schools	Lambeth Borough Council	See Advertisement	do.
Schools	Lambeth Borough Council	T. W. Latham, Architect, Kingsbridge	Jan. 30
*Isolation Hospital near Burgess Hill, Sussex	Lambeth Borough Council	G. T. Hinge, Architect, 35, Parliament-street, Westminster, S.W.	Jan. 31
Gasworks Plant, Prantton	Lambeth Borough Council	W. R. Herring, Engineer, Gasworks, New-street, Edinburgh	Feb. 1
*Lecture Room	Lambeth Borough Council	C. P. Aynes, Architect, Burvaile, Watford	No date
Church and School, Beeston-hill, Leeds	Lambeth Borough Council	W. G. Smithson, Architect, 13, Bon-a-street, Leeds	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Clerk of Works	Dorking R.D.C.	Sl. 3s. per week	Jan. 16
*Clerk of Works	Bodmin Corporation	.....	Jan. 19
Assistant Surveyor	Taunton R.D.C.	170l. per annum	do.
*Engineering Assistant	Croydon County Council	.....	Jan. 23
*Sanitary Inspector	Woolwich Borough Council	104l. per annum	Jan. 28

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. vi. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xviii. xix. & xxi.

Clerks of Works Association (Carpenters' Hall) - Paper by Mr. Lewen Sharp, 7.30 p.m.
 Bristol Society of Architects - Mr. Frank Cowlin on "Building Contracts from a Contractor's Standpoint," 8 p.m.
TUESDAY, JANUARY 15.
 Society of Arts (Applied Art Section) - Mr. Cyril Davenport, F.S.A., on "Comes," 8 p.m.
 Royal Institution - Prof. J. A. Ewing, M.A., on "Practical Mechanics (experimentally treated): First Principles and Modern Illustrations," 8 p.m.
 Institution of Civil Engineers - Papers to be further discussed: - (1) "Glasgow Bridge," by Mr. B. H. Blyth, M.A. (2) "Railway Bridge over the Fitzroy River, at Rockhampton, Queensland," by Mr. W. J. Deak, B.E. (3) "The Niagara Falls and Clifton Steel Arch Bridge," by Mr. Lefferi Lefferi Buck. Paper to be submitted for discussion: - "The Present Condition and Prospects of the Panama Canal Works," by Mr. J. T. Ford, 8 p.m.
WEDNESDAY, JANUARY 16.
 Society of Arts - Mr. H. Snowden Ward on "Photo-

graphy of Natural Colours by the McDonough-Joly Process," 8 p.m.
 St. Paul's Ecclesiastical Society - Paper by Mr. F. Herbert Mansford, entitled "Notes on City Churches," 7.30 p.m.
 Builders' Foremen and Clerks of Works Institution - Annual meeting, 8 p.m.
 British Archaeological Association - Dr. Fryer, M.A., on "Forts in Cornwall," 8 p.m.
 Institution of Civil Engineers - Students visit to the Ventilation, Warming, Drainage, and Lighting arrangements at the Houses of Parliament. Assemblage at the Chancellor's Gate, Abingdon-street, Westminster, 2.30 p.m.
 Edinburgh Architectural Association - Professor G. Baldwin Brown on "Colour in Architecture," 8 p.m.
THURSDAY, JANUARY 17.
 Society of Arts (Indian Section) - Dr. John W. Evans, D.Sc., on "Metalliferous Mining in India," 4.30 p.m.
 London Institution - Mr. E. Stuart Bruce, M.A., on "Modern Aeronautics," illustrated, 6 p.m.

FRIDAY, JANUARY 18.
 Architectural Association - Mr. Edwin T. Hall on "Flats," 7.30 p.m.
 Royal Institution - Professor Dewar, M.A., on "Gases at the Beginning and End of the Century," 9 p.m.
 Institution of Mechanical Engineers - Fifty-fourth annual general meeting. Election of President and members of council. The first presentation by the Institution of the Williams Premium will be made to Captain H. Rial Sankey; and the prizes awarded by the council for the best two papers in the Graduates' Section will be presented to Mr. W. B. Cleverly and Mr. Bress van Homan. The adjourned discussion will be resumed upon the following paper, by Mr. H. A. Humphrey, on "Powergas and Large Gas-engines for Central Stations," read at the December meeting, 8 p.m.
 Architectural Association of Ireland (Technical Demonstrations) - Mr. Malcolm on "Limes, Lathing, Plastering, Cement," &c. (at Messrs. G. Rome & Co.'s, 22, Moss-street), 4.30 p.m.

PRICES CURRENT OF MATERIALS.

*. Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Table listing prices for various types of bricks and building materials, including Hard Stocks, Rough Stocks, and Glazed Bricks.

NOTES

The cement and lime is exclusive of the ordinary charge for sacks. Grey Stone Lime... 13s. 6d. per yard, delivered.

STONE.

Table listing prices for various types of stone, including Ancaster in blocks, Bath, and Farleigh Down Bath.

SLATES.

Table listing prices for various types of slates, including best blue Bangor and best second.

TILES.

Table listing prices for various types of tiles, including Best plain red roofing tiles and Hip and valley tiles.

WOOD.

Table listing prices for various types of wood, including Deals, Battens, and Planks.

PRICES CURRENT (Continued).

WOOD.

Table listing prices for Fir timber, including Best middling Danzig or Memel.

JOINERS' WOOD.

Table listing prices for various types of joiners' wood, including White Sea, Petersburg, and Yellow Pine.

Table listing prices for various types of wood, including Yellow Pine, Kauri Pine, and Dry Mahogany.

JOISTS, GIRDERS, &c.

Table listing prices for various types of joists and girders, including Rolled Steel Joists and Compound Girders.

METALS.

Table listing prices for various types of metals, including Iron, Steel, Lead, Zinc, and Copper.

PRICES CURRENT (Continued).

METALS.

Table listing prices for various types of metals, including Brass, Tin, and Solders.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for various types of English sheet glass in crates, including 15 oz. thirds and 32 oz. thirds.

OILS, &c.

Table listing prices for various types of oils, including Raw Linsed Oil and Turpentine.

VARNISHES, &c.

Table listing prices for various types of varnishes, including Fine Elastic Copal Varnish and Best Hard Copal Varnish.

TO CORRESPONDENTS.

B. H. & Co.—H. C.—W. S. (Amounts should have been stated.) NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

TENDERS.

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

BURY (Lancs).—For the execution of private street works for the Corporation. Mr. A. W. Bradley, C.E., Town Hall, Bury; Peter Booth, Breightmet, near Bolton; Samuel Fletcher, Heywood; Salisbury & Williamson, Blackpool; H. A. Sampson, Rochdale; Ratcliffe & Woodhead, Bury.

CHESTER.—For the construction of sewers, Little Sutton, for the Wirral Rural District Council. Messrs. Beloe & Priest, MM. Inst. C. E., 13, Harrington-street, Liverpool:—
 J. E. Gabbitt £10,700 7 10
 Charles Burt 9,923 0 0
 W. Jowett 6,259 6 7
 Marr & Sons 8,634 0 0
 F. Philp & Eaton 8,110 13 4
 J. MacCabe 8,100 0 0
 J. Taylor £7,450 0 0
 Simon John-son, Ilam-son, Herghts, Manchester* 6,657 0 0

DUDLEY.—For sewerage Netherton and Woodside districts for the Corporation. Mr. John Gammage, Borough Engineer, Town Hall, Dudley. Quantities by surveyor:—
 Barnes & Co. £24,707 0 0
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 J. Owens... 22,105 0 0
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ILLUSTRATIONS.

38-39, Cheyne Walk, Chelsea.—Mr. C. R. Ashbee, M.A., Architect	Double Page Ink Photo.
Proposed Seaside Residence, Hunstanton.—Mr. C. F. Skipper, Architect	.....	Double Page Ink Photo.
Design for the End of a School Hall.—By Mr. J. W. Newman	.....	Double Page Ink Photo.
Church, S. Francois de Sales, S. Trond, Belgium.—Drawn by Mr. J. Martin Brooks, A.R.I.B.A.	.....	Single Page Photo-Litho.
Premises for the Dublin Bread Company, Dublin.—Mr. G. F. Beckett, Architect	Single Page Photo-Litho.

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Students' Designs at the Institute.



HERE has been an unusually large competition this year for most of the prizes offered by the Institute to architectural students. For the Soane medallion there are twenty-two competitors; for the Tite prize twenty-six; for the Grissell medal, not usually a popular prize, and generally not drawing more than half a dozen competitors, there are eighteen; and even the Essay prize, for which a single competitor has not infrequently had a walk over, has this year induced three gentlemen to express their opinions at length on the interesting question of "The Comparative Desirability of Formal or Irregular Treatment of Street Architecture in Large Cities." We do not know whether there is any special cause for it, but there certainly seems to have been a kind of awakening among the student ranks this year. This is gratifying in itself; and what is more gratifying is that the great increase is in the competitions in design (the Soane, the Tite, and Grissell prizes), in contradistinction to those which are for mere drawing; and this seems to indicate that our young architects are beginning to recognise that architecture really means design and not drawing, however charming and improving a pursuit is architectural sketching in itself.

When we turn from the question of quantity to that of quality, the result is not so satisfactory, more especially in regard to the Soane medallion. This we regard as the most important and valuable of all the Institute prizes, since it is the only one which is concerned with the complete design and planning of an important building, as it might be carried out in actual practice. The Tite prize might be given for a similar class of work, but the subject set for this prize has generally been (as it is this year) rather more of the character of ornamental architecture, and rightly so, as the special object of the prize was the study of Italian architecture, or of a type of architecture coming within that definition, as a matter of style. But the Soane medallion is for

architecture in the fuller and complete sense of the word—the working out of a building in the practical as well as the artistic sense; if indeed plan ought not to be considered as an essential part of the artistic design. And in this sense we fear it cannot be said that the results of the competition rise to the occasion. So far as the exterior treatment is concerned there are not many which can really be called good designs, and the most satisfactory in this sense are in almost every case marred by serious defects of planning. On the other hand there are some good plans which are accompanied by bad exterior designs. There is no single *ouoi* which rises to the height of the occasion, or which equals some of the productions which conferred honour on competitors of bygone days.

The subject is "A Club-House in a Large City"; a very good subject, attractive (obviously) and not too difficult in respect of technical requirements. It may be useful if we take the competition as the occasion for a few words in regard to the architectural requirements and treatment of a club-house. As far as architectural character is concerned, it should be borne in mind that a club is to a certain extent a domestic building, a building for daily life, and one which should therefore have both the appearance and the reality of comfort; but it expresses daily life deprived of its character of *intimité* and individuality; the home not of one family but of a number of individuals unconnected together by any family tie. It therefore naturally assumes a larger and more stately air than should belong to any private house except what is admittedly a mansion of State. Bridgewater House, which is a private mansion, has in fact all the characteristics of club architecture externally, but this is a residence of exceptional size and stateliness. As a club on a large scale is an appanage of the wealthier class, it may rightly express this in the sumptuous character of its architectural treatment, but at the same time it should avoid assuming anything of the appearance proper to a public building, or which may lead to its being mistaken for one. Such features therefore as a large dome, or a tower of any kind, are out of place and give a false impression of the object of the building; unless perhaps

in the case of a yachting club at the seaside, when a small tower may be appropriate as a place for a lookout to seaward. Nor, though there may be dignity, should there be anything like display or self-assertion; that is at variance with its character as a gentleman's house. The Reform Club, though it may be thought to err on the side of quietness and simplicity (externally), has much more of the proper club character than the Carlton, with its display of polished granite columns and pilasters. Generally speaking, the employment of a large "order" on the façade of a club is out of place, apart from general grounds of architectural criticism (which might condemn such a treatment in any building), as at variance with the semi-domestic character of a club; the Junior Naval and Military Club, in Piccadilly, for instance, looks a good deal too much like a Bank. A good many of the well-known Pall Mall clubs, although the architecture of some of them may not be worth very much considered in detail, represent the general ideal of club architecture exceedingly well. The United Service, the Athenæum, the Travellers', the Reform, the Army and Navy, and the Oxford and Cambridge, all have the proper club expression of dignity without showiness, and preserving something of the "house" character; perhaps the sculptured panels in the last-named give a little too much the suggestion of an Athenæum or public library. The New University Club, in St. James's-street, is also, in another style, a building with the semi-domestic character of a club, while the front of the Royal Societies Club in the same street, with its large plate-glass windows in the ground story, suggests the idea of an "emporium" with a showroom on the ground floor. Some large recent clubs, such as the National Liberal and National Constitutional, produce too much the impression of hotels; it is not very easy to say why, but they certainly have that *genre* about them. In regard to detail, a club building cannot be too refined and carefully considered; it should express the acme of refinement and good taste. We may add that the American architects seem to understand club architecture exceedingly well; a good many designs for buildings of this class which have been illustrated from time to time in the American professional journals are

perfectly admirable examples of what club architecture should be.

In the interior a club requires a pretty large hall and staircase, both for reasons of dignity and because there must be plenty of space for a large number of members to move about without being in each other's way. As far as architectural character is concerned there is no necessity for a great central staircase hall lighted from above; it may even be argued that there is a little too much of the public building character in this; but on the other hand it is the easiest way of securing light to the hall; the difficulty of adequate lighting otherwise is only too well exemplified in a good many of the Soane competition designs. Generally speaking a club is a tolerably easy kind of building to plan, as there is usually plenty of space, and the principal apartments are a few large rooms which present no difficulty in arrangement. Among the small mistakes of the Soane competitors, however, are that of providing only one door at the corner for entering a room 100 ft. long, and that of one competitor, "Thistle," in lighting one of the main front rooms with windows on opposite sides, an arrangement destructive both of comfort and (in a room next the street) of privacy, as passers-by can look right through it. The two little difficulties in the planning of the principal rooms occur in connexion with the billiard-room and with the strangers' department. For convenience of access, the billiard-room should be near the dining-room; for convenience of playing, in the daytime (and club billiard-rooms are often much used in the daytime), it should be lighted from the ceiling, which can often only be managed by putting it on the upper floor. In an American club this would not matter, as there would certainly be a lift; but in English clubs lifts are not favoured, being tacitly supposed to be out of place in a club. Billiards can, however, be satisfactorily played with a side-light, but it must be an ample and a suitable light; points on which some of the Soane competitors seem to be quite at sea. "City" shows his billiard-rooms on the ground floor with a south light, which in summer is out of the question; a player opposite the windows would have the sun in his eyes, and pulling down the blinds would not leave enough light; the aspect must be north or east. Another competitor shows a basement billiard-room with one small window in the corner, which is of course absurd except on the supposition that artificial light is used all day—a possible but most undesirable expedient. The best resource is to place the billiard-room in a portion of the principal floor which need not be carried up, and give it a ceiling light. The Strangers' department offers another problem. Your clubman is rather jealous of strangers, and does not wish them to penetrate beyond their allotted precincts, or to be too much in evidence in any way. It is therefore certainly a mistake for "Rime" to have made his strangers' dining-room only accessible through the club dining-room, and for he and others to have placed the strangers' smoking-room at almost the greatest possible distance from their dining-room; and it is equally a mistake on the part of "Hiawatha" to have given the strangers' smoking-room and cardroom the central and architecturally emphasised entrance from the first-floor hall. The promi-

nent and central entrances should be for members. "Grex" has had a good idea in placing the strangers' rooms *en suite* on the ground floor, the similar rooms for members forming a suite on the first floor over them. The only objection is that the door of the strangers' dining-room is the central one in the entrance-hall facing the entrance; but it may be replied that upstairs is the principal floor, and that the position of the strangers' rooms on the ground floor prevents their penetrating into the members' territory—"Thus far shalt thou go and no farther."

The most original of the more meritorious designs (there are some that are original without being meritorious) is that signed "Ars," who has treated the front in a slightly concave line on plan, with a circular vestibule and cupola projecting in the centre of it; the arrangement is rather odd, but would be susceptible of effective treatment. The plan of the main hall and the coffee-room to which it leads up is the only thing in the whole set of designs which rises to the level of a really fine architectural conception. He has found the upstairs lobbies difficult to manage, and the small bracketed-out gallery forming the only communication across the stairs is a very weak point. Both the library and the private dining-room would be deficient in light, the library especially; a library requires a good light all through, and a window at each end of this long room would leave the centre portion without light enough to see the books properly. This, however, is a very meritorious plan, and the conception of the design is good, but it is spoiled in the perspective by weak or ragged handling. "Hiawatha," which we have already referred to, is one of the best efforts; the Classic front with an order is shown in rather a scraggy line drawing, but would work out well with good detail, and the plan has much merit. This and "Ars" are the two best taken all round.

We may add a few brief remarks on some of the others. "City" shows a sensible quiet elevation, which looks like a club, but the built-out corbels under the balcony are clumsy in appearance; the plan has some good points. "Fordinbridge" has a darkly-tinted perspective showing a rather good façade, though the centre and wings hardly seem to harmonise; the rooms are too small and there are other faults in plan. "Post Fanum Vacunæ" shows a centre garden-court lighting the corridors, and the arrangement of the south range of rooms is very good; but the secretary's room and committee-room would practically have no light at all. "Rime" shows a very simple elevation in good taste, but much too naive for a club. "Ionic" has gone in for winning the competition by dint of drawing; his perspective is much the finest drawing in the room, but there is little in the architectural idea apart from the drawing, and the plan is hopeless, as the main hall and nearly all the corridors are totally devoid of proper lighting; no one could live in such a building. "Elsa" shows a very pretty little perspective view of an Italian façade, unfortunately associated with a plan which is quite puerile. "Ace of Clubs" has one of the best plans in a practical sense, the rooms mostly well arranged and considerable care taken about lighting the corridors; the defect is that it is a merely practical plan, with no sense of interior effect, and the

façade is clumsy in detail, especially the treatment of the porch. We have already referred to a good point in the plan of "Grex," and may add that the elevation is graceful and pleasing.

The Tite competition, for "An Entrance Gateway to a Public Park," shows a better general average than the Soane; of course it is an easier subject, as there are no difficulties of planning to consider. It should be remembered that it was founded for the promotion of the study of "Italian architecture," and that in Tite's day and in his intention this meant Italian Renaissance. Such a design as "Le Nord," therefore, does not come under the definition, and should not have been accepted; and in any case it is bad as a conception, for it is, one may say, an absolute essential that a park entrance gate and screen should be symmetrical on each side of the roadway; it is an absurdity otherwise. Of course, in regarding the competition as restricted to Italian Renaissance, we are not denying that there may be attempts to develop that style in a greater or less degree in regard to treatment of detail. This has been recognised by the author of "St. George," undoubtedly the best design submitted, though shown in slighter and less finished drawings than many others. He treats the gateway simply as a gateway—a block with three archways, the centre raised a little, and sculpture decoration well introduced as a finish. The gate is led up to by Ionic colonnades, on each side in a concave line, and terminating in outpost blocks which harmonise with and partly repeat the design of the gateway block. The ironwork of the gates and the grilles in the colonnade are charmingly designed; original and new in treatment, and yet quite in harmony with the masonry design. The one weak point is that the entablature of the colonnades returns on itself to stop against the sides of the flanking blocks, thus showing a weak angle at the end; it ought to have stopped *against* them at the back. But as a whole this design shows the feeling of an artist. The next best to this, perhaps, is one in rather the same manner but making larger use of sculpture—that signed "Lion"; a very good composition, except that the rather heavy block with sculpture accessories seems wrongly placed over the columned opening in the wing-walls.

There are some other good designs; the prevalent mistake is in trying to do too much. A game composition of this kind should be simple and restrained as a whole, however richly ornamented. Thus, in "Nocturne," the perspective view of which is pretty, the lower erections forming entrances to the terrace are out of scale with the rest and detract from the effect; it may be added that the octagonal turrets to the centre block, rising from behind the colonnades, do not seem to harmonise with the rest of the composition. In "San Gallo" the dome comes much too abruptly on the top of that large arch, and it may be questioned whether a dome is in place at all. A gate is a gate, not a building. "Marble Arch" has merits, though the cupolas at the sides, graceful in themselves, do not seem quite to belong to the main composition. "The Bard" is a design of some power, with a mass of rustication on the centre block, obelisk finials, and

blanked by a large concave double arcade. It may be a question whether the cupola on the top should be rusticated, above the plain attic. "Englishman," a tawdry affair, is we trust wrongly named. "Pencil" is a rather weak design as a whole; it is too flat and thin, but the author shows a very good detail drawing. So does "Fiori," whose design is however much too complicated, and the general perspective drawn in a detestable style.

The Grissell medal is properly given for construction, and should be so regarded; in the present instance the subject, "A Wooden Bridge," has tempted several competitors into bedizening their construction with gimcrack ornament which ought to be enough to disqualify any competitor. Fortunately the best constructed, "Kopper-nob" and "Draughtsman," are also the least pretensions in this sense. "Trabs" treats his bridge railing well with a certain amount of simple character.

The Pugin drawings contain a great many good sketches and drawings, but we should be inclined to say that the set which are most germane to the objects of the studentship are the comparatively small but numerous and excellently handled pencil sketches by Mr. H. W. Cotman. The Owen Jones drawings are also a good collection, among which those of Mr. McLachlan seem to combine the most varied quality of work, including both geometrical drawing and good water-colour views of buildings.

We have seen some finer sets of measured drawings than any of the six sets submitted this year for the Silver Medal; but they make a good show, and include some interesting buildings—St. John's, Westminster; Burghley House; St. Magnus; the Exeter Guildhall, &c. The drawings of the latter, signed "Semper Fidelis," are the neatest in finish, but do not contain so much work as some of the others. St. John's, Westminster ("Archer"), is a large and complete set of drawings; the perspective is weak, but as this is a prize for measured drawings the perspective is merely an extra which need not be considered.

In each of the three sets of drawings,—the Pugin, Owen Jones, and Silver Medal, the adjudicators will have had some difficulty in deciding on the award. We cannot but regret that architectural design, especially as regards plan, does not seem to make more progress.

NOTES ON THE RIVIERA.

AMONG the features of the new century must certainly be numbered the growth of the towns of the French and Italian Riviera. To many English people the places which stud the northern shores of the Mediterranean are as familiar as, and often more so than, the cities of their own country. And for one reason this is not surprising; for whether we take the towns of the French Riviera—Cannes, Nice, Monte Carlo, and Mentone, or those of the Italian Riviera—Bordighera, San Remo, and others almost to Genoa, nothing is more noticeable in their development than the study which is given to physical comfort. If we compare the ordinary English hotel with those of the Riviera it will be seen that in England we have been standing still. Long ago sanitary arrangements were superior in England to those in any other part of the world; now

it is pretty certain that many foreign hotels are, taking them one with another, better equipped in this respect than those of England, except where the charges of the latter are very costly. Nowhere has the necessity of good sanitation been more carefully kept in sight than on the Riviera. One result is that the sanitary state of all European hotels is thereby improved, since hotel proprietors, who are amazingly cosmopolitan, recognise that the English visitors demand good sanitation, well-ventilated and well-warmed rooms. The odd part of this is that English men and women put up in their own country with accommodation which they would not for a moment endure on the Riviera. A review, indeed, of the hotels at the towns already named would show in the last decade an extraordinary development in the art of public entertainment for profit. We say "art," because there exists something in the nature of an art in building and equipping houses for the stay of strangers.

On the Riviera the main object of architects is to make the most of the sun and to avoid the wind. Aspect is everything, and a house placed in a right aspect must be constructed so as to take all possible advantage of the sun, even though in January it shines day by day as we sometimes find it in England in ideal midsummer weather. It may be doubted whether, in a sunless country such as England, architects study the question of utilising the sun as much as they should do. It may be that we are so accustomed to be without it that we defiantly determine to build without regard to it. But certainly it is interesting and important to observe how those who have had to advise on the construction of the more modern hotels on the Riviera have designed the buildings to capture the sun. Thus the dining-room of the Riviera Palace at Mentone has at the southern end an enormous bow, the breadth of the room, almost wholly glass; by this nearly the whole room is flooded with sunshine. Again, the hall is constructed so as to form a place for sitting, reading, or writing, the entire length having a window looking due south. The arrangements are simple, but this same simplicity is the more effective, for it successfully achieves an important purpose. The more modern hotels are also beginning to be planned with balconies, one of the most important points for obtaining sun and air to the full. The still incomplete building at Monte Carlo adjoining the Balmoral Palace Hotel, and facing to the west and so towards Monaco and its warm and quaint palace, is the best example on the Riviera of the appreciation not only of the utility but the picturesqueness of the balcony. This building may be a little too ornate, but it harmonises thoroughly with the glow and colour of the Mediterranean shore. Of the private villas on the Riviera as much has not yet been made as is possible; but the richness and beauty of the vegetation with which they are surrounded—the palms and the delicate mimosa, the formal but brilliant orange-trees—almost render simple white buildings the most effective.

We have dwelt upon some of the architectural features which distinguish what may be called the northern colonisation of the Riviera. But the astonishing growth of these towns in the last quarter of the century which has just ended must be regarded as a

noticeable social phenomenon. Opposite that singular collection of buildings which forms the town and Palace of Monaco has arisen a group of buildings of the most luxurious and complete description, ornate in character and full of comfort. The contrast of the small mediæval Italian principality with the modern city is remarkable—the past and the present stand side by side. Still more so, though in different forms, is this contrast noticeable at Mentone. Under the shelter of the rock on which the old cemetery stands are the clustered red-roofed houses of the ancient town of Mentone, half port, half fishing village, for two centuries under the rule of the Grimaldis, Princes of Monaco, and then for sixteen years, from 1848, a free town under the protection of the kingdom of Sardinia. On either hand villas and hotels and modern dwelling-houses have sprung up, from the Pont St. Louis on the east to Cap Martin on the west. But there in their midst is the quaint, crowded, ill-smelling relic of mediævalism, once a free town, reminding us how historically inaccurate it is to speak of this stretch of Mediterranean coast as the French Riviera. Still greater is the contrast between Mentone and Castellare, perched on its heights, surrounded by the silver olive-groves which cover the precipitous sides of the valleys of Mentone and Carrei. From the little "Place," to which alleys called streets lead, can be seen glimpses of the modern buildings of the Mentone of to-day, while in the squalid village, wanting indeed its walls, is visible—little changed—the fortified town of the Lascaris, Counts of Ventimiglia.

The contrast also between Nature and what perhaps for convenience may be called civilisation is more marked on the Riviera than almost anywhere else in the world. On a rocky point washed by the waves there suddenly, as it were, appears a great house of bright white stone, not wanting often in an opulent beauty. These intermediate hotels are springing up all along the Riviera. At the end of the rocky pine-clad gorge of La Turbie stands, for example, the Hotel Eden; on the sunny but sometimes wind-swept point of Cap Martin, among the brushwood and firs, there is an equally striking structure. The little promontory is utilised in a manner which is only to be found in the Riviera, since it is not mere ordinary comfort and four common walls which are placed on what was once a desolate rock, but a building such as one associates with the Boulevards of Paris. And the size and ornamentation of these white stone buildings is not disagreeable; on the contrary, they seem to harmonise with the expanse of light, the colouring of sea and mountain in which they stand. Whether from the commercial point of view this building of expensive structures may not be going on too fast one may perhaps doubt, but the energy and taste which are shown in these buildings can nowhere be surpassed.

As has already been pointed out, this remarkable change has occurred during the last quarter of the century. It is not a change caused by the development of the native population, by the growth of native industries as in the United States, but by an invasion, so to say, of Northern multitudes; for when we survey the coastline from Toulon to Genoa, and bear in

mind that along the whole of it there are hundreds of strangers during the winter collected like swallows from all parts of Europe and of America, we must recognise that we are in the presence of a phenomenon that should be noted. Technically this development of villa and hotel is of much interest to those connected in any way with buildings, but it should be regarded also from a broader standpoint, and as enabling us to contrast the mediæval town and village with the buildings of to-day. It is a development produced, as has been pointed out, wholly by external means, and as communication between North and South becomes more easy and convenient, this modern tendency to seek the sun must become stronger and more popular. Nor can it fail to have influences on English buildings and English habits. The climate of much of the south coast of England, though it never can be as dry and sunny as that of France and Italy, yet can give a sufficiency of sunshine for many. Yet how little is done to utilise its precious warmth, or to make, as on the Riviera, houses equable in temperature whether the sun be shining or not! It is not only continuous and brilliant sunshine, but the higher average of comfort and warmth which makes so many seek the shores of the Mediterranean, which in the future must unquestionably witness a far greater development of structures of every kind for the use of the stranger from the North.

NOTES.

The London County Council Water Bill. SOME controversy has recently been taking place in regard to the promotion in the approaching session of Parliament of the London County Council Fifth Water Bill. It has been said that it is wasting the ratepayers' money when it is obvious that this measure will not be supported—indeed, will be opposed—by Government. The Council is, however, acting in what may be called a constitutional, and also in a businesslike manner. It is the representative of the ratepayers; and the majority of the ratepayers of London, as shown by the character of the Council, are in favour of the purchase of the undertakings of the water companies. Therefore the Council must fulfil its mandate, and endeavour to carry it to a practical conclusion. Apart, however, from that view of the subject, it is obvious that unless the Council presses this matter on the attention of Parliament the Government will make no serious attempt to grapple with it. The last effort, two sessions ago, was a lamentable failure, and it needs pressure from London to obtain any measure whatever. The singular thing is that the Government should interfere in this matter at all. Birmingham, Liverpool, all the large provincial towns, are allowed to carry out their own municipal policy. One reason why London ratepayers are so apathetic is because the Metropolis is watched, and in a sense directed, by the Government of the day, instead of being allowed to work out its own salvation in strictly municipal matters.

Architectural Discoveries at Thermen. THERMON, in Ætolia, is little more than a day's journey from Athens, and yet until the recent excavations it was practically as unknown as though it were in another

hemisphere. In the days of Polybius it was the religious and political centre of the Ætolian confederation. The excavations have laid bare not a town but, as in the analogous case of Olympia, a sacred enclosure, an Altis. The greater part of the remains discovered, both architectural and epigraphical, are of the third and second century B.C., but one building, the ancient temple of Apollo Thermon, is of a date long anterior. This temple is of the Doric order; it is peripheral, with a colonnade of five by fifteen columns; it has an opisthodomos, but apparently no pronaos. It was destroyed about 218 B.C. by fire; and, of course, the new structure was in stone, but the bases extant show to the eye of the expert that they once supported columns in wood; they closely resemble the bases of the palace at Tiryns. In fact, the temple was of the primitive order of structure, *i.e.*, a compound of wood and terra-cotta. Great interest attaches to the remarkable terra-cotta remains, which have been found in large quantities. They consist of:—1. Antifixæ of the frontal roof tiles (*ἡγρόνιες κεραμίδες*). 2. Painted metopes. The antifixæ are heads of men, women, and Sileni—archaic for the most part, a few of the early fifth century B.C. They are brilliantly coloured. The metopes are decorated with mythological subjects, some inscribed. So far it has been possible to restore an archaic Gorgon, a Perseus taking flight, holding the head of Medusa, three seated divinities, and a huntsman with his prey. The temple presumably belongs to the fifth century B.C.

Views of London in the Eighteenth Century. A NOTABLE collection of paintings was dispersed at Christie's auction-rooms on Saturday in last week. The pictures, twenty-one in number, of large size, and well preserved, comprised paintings ascribed to Canaletto, Samuel Scott, E. Dayes, T. Malton, J. Boydell, J. B. Chatelaine, and J. Farington. Some of them are finely executed, and many illustrate views that have been but rarely represented. Amongst the latter kind are the seven by (or after) J. Boydell, showing the Tower as seen from the Thames, with trees—30 in. by 30 in.; Smithfield market-place, with St. Bartholomew's Hospital in the background; Skinner-street and Holborn Hill—a very uncommon subject; and old Chelsea, or rather Battersea, wooden Bridge, with the mill and the church on the river's right bank. The design of the bridge, somewhat similar to that of old Putney Bridge (illustrated in our columns of January 7, 1888), has been attributed to Cheselden, surgeon of the Royal Military Hospital, who, however, died in 1752. The bridge was erected in place of Chelsea ferry, for John Earl of Spencer, lord of the manor, and fourteen other proprietors, who subscribed 1,500*l.* apiece, in 1771-2, after the designs of Henry Holland (*obit* 1806), at a cost of about 23,000*l.*, by Phillips, George III.'s carpenter, whose father had also built Putney Bridge. Battersea Bridge was pulled down in the winter 1835-6; of Putney Bridge the collection included a view by E. Dayes. The design of Putney Bridge (1729-1836) has been attributed to Cheselden, to whom the proprietors passed a resolution of thanks on July 2, 1730; and also to Ripley. According to Chasemore's account, 1875, it is due to Sir Jacob Ackworth. The

fabric cost 23,075*l.* Another remarkable painting (Canaletto), which it is believed has not been engraved, depicts the Monument and St. Magnus Church, as seen by one looking down Gracechurch-street and Fish-street-hill. A pair, 30 in. by 50 in. (S. Scott), show old London Bridge with St. Magnus and St. Michael Churches, and the river-side between York Water-gate and Blackfriars Bridge. In the view (E. Dayes) of Leicester-fields, we see Saville House, in respect of which we have found in the St. Anne, Soho, rate-books that the Earl of Ailesbury was rated at 3*l.* 12*s.* in 1693, and Leicester House for which the Earl of Leicester was rated at 7*l.* 10*s.* in 1711—and which stood where the Empire Theatre and the adjoining hotel now stand. Bloomsbury-square (E. Dayes) shows the house of Lord Mansfield, at the north end of the east side, which the "No. Popery" rioters sacked and burned in June, 1780, with Southampton House (on the north side) built in 1664-5 for Thomas Wriothesley, Earl of Southampton, and demolished in 1800. We may mention, too, the rare view (T. Malton) of Fleet-street with the Church of St. Dunstan to the spectator's right-hand; the garden, as seen from the river, of Denmark House (Canaletto) with the water-stairs, and St. Paul's in the distance; Old Westminster Bridge (J. Farington); and St. James's Palace (Canaletto) with the Gate-house in the foreground, and Pall Mall leading towards the Haymarket and the King's Mews, which Kent rebuilt, beyond. The sale realised nearly 2,300*l.*, the prices ranging from 240 guineas for the last-named picture to 40 guineas for the view of the Tower.

The Sydenham Boiler Explosion. THE Board of Trade Report on the boiler explosion which occurred in July last at the works of the Crystal Palace Electric Supply Company has now been issued, and it discloses incompetence and neglect which, we hope and believe, are very unusual. The boiler was of the locomotive type, working at a pressure of 140 lbs. per square inch; it was nearly nine years old, and owing to weakness of the fire-box crown, that part was violently blown out, leaving a hole measuring about 6 ft. by 3 ft. 6 in., the explosion killing two, and injuring five, persons. It is stated in the Report that the boiler itself was of faulty construction, but this was not the real or immediate cause of the explosion, which is directly attributed to "the failure to make proper examinations." Several persons are blamed for this neglect. The company did not engage a competent person to examine their boilers in June, 1898, and thereafter; the boiler was not periodically examined by their fitter, who, moreover, was not competent to perform such work; the electrical engineer to the company knew there was deflection in the fire-box, and having been advised by a competent authority that he should test the boiler by hydraulic pressure to 280 lbs. per square inch, he failed to do so. An inspector who examined the boiler on behalf of an insurance company did not perform his work thoroughly, and did not even notice the deflection in the fire-box. In the opinion of the Commissioners the explosion was caused by the neglect of the electrical engineer, and it was contributed to by the neglect of the insurance inspector. We also believe that the boiler was on the point of being replaced.

by a new one when the explosion occurred. It seems probable that the directors trusted in the providential preservation of the old boiler until such time as the new one could be installed, and that their cheerful optimism was confirmed by the absence of any strong protest from the electrical engineer. One of the directors stated that "the company had insured only for the sake of being indemnified from loss caused by an explosion," and another director suggested that "insurance was effected for the additional purpose of obtaining regular inspections." The Commissioners state the opinion that the latter reason "was not very present to the minds of the directors." A most culpable condition of negligence certainly appears to have afflicted all those concerned in this disastrous accident.

Another Gas Geyser Fatality.
 IN our issue of the 22nd ult. we recorded the death of a lad at Hammersmith caused by the use of a gas geyser in a small bathroom. Another death which is also attributed to the employment of a gas geyser in a bathroom is now reported from Newton-le-Willows. The victim this time is Mr. D. H. Jeyd, the Gas and Water Engineer to the Newton-le-Willows District Council, a gentleman of about thirty-five years of age. He was found dead in the bath early on Sunday morning, the 6th inst. The depth of water in the bath was about 8 in. The geyser employed for heating the bath water was found to be red-hot, and the woodwork in the neighbourhood was on fire. The gas had become ignited at the air inlet, and consequently the gas was burning with a luminous flame inside the mixing tube, and products of incomplete combustion were formed. It appears improbable that the gas became ignited at the air inlet before the geyser became insensible, for any gas engineer would at once detect the odour evolved when gas is burned under these conditions. The evidence showed that the bath was due partly to syncope and partly to asphyxia, and the jury returned a verdict "accidental death." Once again we have to recommend the fitting of geysers outside, instead of inside, bathrooms; and where this is impossible, the provision of a flue for carrying away the combustion products and ventilating the room, without regard to any statement from the gasfitter or the vendor of the geyser concerning the needlessness of such a flue. If, moreover, the bather would take the precaution to turn off the gas before entering the bath, fatal accidents arising from the use of gas geysers would less frequently occur.

Aluminium.
 MR. KERSHAW read a valuable paper on the electrical uses of aluminium to the Institution of Electrical Engineers last week. The high price to which copper has been forced by a combination of natural and artificial causes has made electricians take the greatest interest in aluminium as a substitute for copper. In America many thousands of tons of aluminium wire are already in use, but exhaustive tests have not yet been made on its durability. Mr. Kershaw stretched some aluminium wires on the roofs of buildings at St. Helens, Lancashire, and so on at a town on the outskirts of Liverpool, and left them in the open air for six months. At the end of the time the wires were taken down, and after being

thoroughly scrubbed were weighed. It was found that most of them had gained in weight. This was due to the corrosion of the rods and wires, and to the settling of soot and dirt in the crevices. The conductivity for electric current of the wires suspended at St. Helens had diminished about 30 per cent, by the exposure, and the tensile strength had also diminished by about the same amount. This proves that the aluminium wire at present sold corrodes in outdoor work in our climate, and in manufacturing towns where sulphurous acid gas exists as an impurity in the atmosphere it corrodes rapidly. In the discussion Mr. Gavey, the electrician to the Post Office, stated that experimental trials of this metal for long-distance telephonic communication were being made, but that the results were far from satisfactory. The large coefficient of expansion for heat of aluminium has led to frequent breaks and consequent interruption of the service. Mr. Swinburne suggested that more thorough chemical tests should be made on commercial aluminium, as he found that very minute traces of impurity sometimes made it very rotten and friable. Professor Perry mentioned that Dr. Glazebrook, the Principal of the National Standardising Laboratory which is to be erected in Bushey Park, intended carrying out an exhaustive series of tests on this metal.

Widening of Hampstead-road.
 WE are informed that a meeting of influential traders and ratepayers of St. Pancras has been held to consider the question of widening the Hampstead-road at its junction with the Euston-road, and a committee, including representatives from all the large business houses in Tottenham Court, Euston, and Hampstead roads, was formed with a view to bringing the matter before the London County Council as a Metropolitan improvement. It was urged that the congestion of traffic at this corner is now so great that it is of the utmost importance that something should be done to relieve it. We quite agree as to the desirability of the improvement; we need only point out that the widening ought to be made at the east side of Hampstead-road, so as to bring it into line with Tottenham Court-road on that side.

Water-colour Art of the Nineteenth Century.
 THE rooms of the Fine Art Society are entirely devoted at present to an exhibition representing "The Water-colour Art of the Nineteenth Century"; the middle room containing early works, the west room works of deceased artists later in the century, and the south room works of living artists. Among the early brown drawings executed with the limited water-colour palette of that day, is Girtin's well-known grand view of Durham belonging to Mr. Roget, who formerly lent it to a Girtin exhibition at the Burlington Club. There are some works by less-known men of great interest; for instance, Powell's delicate little landscape (4) exhibited at the Royal Academy in the early part of the century. Shepherd's "St. Albans" (29) is a beautiful drawing, also Barrett's "Thames from Richmond Hill" (32), not equal, however, to John Varley's rendering of the same view (50). Among the later collection is to be seen Alfred Hunt's wonderful picture, "The Rainbow" (136), in which he almost succeeded in the apparently impossible task

of painting light. There are two or three splendid examples of William Hunt's still-life painting; some interesting early works by F. Walker; one drawing by Boyce (132) which hardly represents his finest work; David Cox's "Welsh Funeral"; a beautiful "Chrysanthemums" subject by Mrs. Angell (110), and a fine example (116) of George Frigg's broad and unpretentious style of landscape-painting. The collection of the works of living artists is hardly so representative as it might have been; it gives the idea of representing what could be got rather than what might be desired. There is a fine example of Mr. Phillip's Highland landscape painting, familiar to us at the Society of Water Colours; Mr. Fulleylove's view of the "Temple of Wingless Victory"; Mr. Sutton Palmer's "The Joy of Spring" (194); these are among the best works in a collection which, however, can hardly be said to represent the later school of English water-colour art in any adequate manner.

SMALL GARDENS.*

ONE of the most pleasing signs in the architectural profession is the recognition of the fact that cottage architecture to be truly successful cannot be confined to the planning and designing of the house and elevations, but must have some say in the interior decoration (or what is oftentimes better the avoidance of decoration) and in the design and arrangement of the furniture, the control of the approach to the house and also the garden, or at any rate that portion of the garden which immediately surrounds the house. I am afraid that in many cases the bare recognition or assent to the principle suffices, and that whilst we see here and there sparsely distributed signs of the approaching architectural millennium, we are not quite there yet, and I fear that some of you, when I suggest the addition to the already long list of subjects through which you have to conduct your studies, a technical knowledge of garden making, will almost hope that I do not succeed in proving my case, and yet I can promise that if I succeed I shall introduce you to a subject which shall yield you greater delights than any you have yet tasted in the field of design; and I may add, to the younger members of the profession, that you will soon realise that to a very large extent it is a vein which has not yet been fully worked or explored, and where you can within certain limits express the completeness of your own ideas, and determine what character of design shall rule in the making of a garden. I agree there are greater drawbacks and discouragements to encounter in the garden than in the house, and its interior arrangements or fittings, as so much more depends upon the aptitude and intelligence of the gardener who is to put your ideas into practical shape (a very worthy man in himself, according to his light and his training, but whose ambition is often measured by the local flower show exhibits) than upon either the builder, decorator, or furniture maker, whom you can restrict and restrain and guide by plans, details, designs, or sections. To make myself quite clear I may say that the cottage residence which I have in my mind would range from the small 400 semi-detached with its plot showing a frontage of 60 ft. and a depth of 100 ft., to the small house, with three entertaining rooms and six to eight bedrooms, stabling for two horses, and two acres of ground. Before I proceed to give you a few hints, which I hope you may find of a practical character, I wish to show, first, that you cannot really successfully plan a cottage residence without deciding the principal features comprising the garden scheme. The designer of the cottage ought in any case either to design the complete garden in a scheme or otherwise agree to allow of an exchange of opinion between himself and whoever may have to plan and carry out the garden. Even supposing the landscape gardener to be an artist with insight into, and in full sympathy with, true architectural dignity and expression, the architect

* A paper read before a recent meeting of the Birmingham Architectural Association by Mr. T. H. Mason.

has much the best opportunity of making a successful and complete plan. I also wish to show that if the architect does not undertake the designing the landscape gardener in all probability would not be asked to do it, and as a consequence the garden setting to the house, over which so much time and thought had been spent, would eventually be the joint production of the local jobbing gardener and the client. Respecting the first of these three statements, with whatever feelings or sentiments you may be inclined to approach gardens, I am perfectly convinced that in refusing to design the house as well as gardens I have lost some fine opportunities of gaining that wider outlook which it is so necessary the designer should achieve; and I am free to confess that any grasp which I may have of this principle of unity and completeness which should rule not alone in gardens and houses, but should underlie the character of the whole street, nay, of the whole city. I say, then, that this habit of viewing scenes in their broader aspect has largely resulted from the fact that I have been brought into connexion with a considerable number of clients who, having purchased their sites years before they were prepared to build, or even consult an architect, have nevertheless wished to do the necessary planting, and in some cases to lay out the outer fringe of the gardens. I have thus been compelled to consider the place as a whole, and to plan the houses in a way which I thought would best suit the site and my clients' probable requirements. In this way I must have prepared scores of plans for houses of all sizes, and I can assure you it has been a fine study. My reason for venturing this personal experience is because I feel that I am quite right in saying that it is just as necessary for the architect to realise the proper connexion between house and garden as for the garden designer to obtain a grasp of the character of the design and the planning of a house. I need only emphasise this by pointing out that the approach to a house, whether in the form of a drive, avenue, a simple court, or merely a walk, is the first impression a visitor gains, and generally the most important detail in the garden scheme, and is at the same time the introduction to the house itself. In passing, I would like to mention another great factor which, combined with others, has tended to broaden the vision and educate me to look beyond merely limited prospects; it is the laying out of building estates where the desired aim and object was to accomplish a worthy complement to pure air and pleasant surroundings without desecration and disfigurement, yielding pleasure to the beholder and profit to the proprietor. Architects who wish to lay out gardens would do well to cultivate this faculty of studying nature with a view to the attaining of aggregate effects, a grand antidote against mere sleight-of-hand draughtsman proficiency and commonplace invention, and against a too pedantic academical education. I am well aware of the ever increasing number of subjects that a modern architect has to keep pace with, but this faculty is, in a great measure, intuitive, although the foundation of it may be laid in the student's mind, and incentives and encouragements offered to continue; and when once acquired it has the tendency to soothe rather than irritate the tired brain and jaded spirits. This is a point which, I am pleased to be able to say, is being emphasised and reiterated by all sound reliable guides in architecture, although not, perhaps, entirely in the exact special direction now suggested; notably in Mr. W. H. Seth Smith's presidential address to the Architectural Association.

An architect is really the fittest man to design the garden, and I think it will be generally conceded, even by landscape gardeners, whatever gifts he may possess, that a circumscribed garden is seldom a success unless a formal treatment (why so termed I do not know) is applied. Mr. Kemp, who wrote that excellent practical work, "How to Lay Out a Garden," realised this. The advantage of this method is that the garden design is brought into direct relation with that of the house; that, in fact, a garden becomes a necessary outdoor extension of the family requirements, and of the entertaining arrangements—one set of apartments under cover, the other open to the interchange of shine and shower, and of each season's respective display. The relation of this series of garden apartments to the house would be more ably grasped by the person

who had planned the house and knew the relative use of each room to the other. The ingenuity necessary for the planning of the house would assuredly find larger liberty and unfettered scope in controlling the whole. An architect occupies a much better position than either the landscape gardener or any one else to realise a successful garden, for if he had to be responsible for the whole he would take care that the only place in which a *Marchal Niel* rose would grow is not occupied by the basement area; and that the steps to the beer cellar do not cut into the only piece of ground suitable for a flower garden; and that the coal-shoot is more than 3 ft. from the door of the principal entrance; also that the garden front was as far removed as circumstances would allow from the entrance front, and that the kitchen offices and stables, whilst helping the general effect, were so placed as to allow of their being screened from the private parts of the gardens. But perhaps the greatest advantage which the architect possesses lies in the fact that he has the control of the entire sum which his client is prepared to spend. I thus happen to know from experience what this means, for time and again have I, when called in to advise after the house was partly completed, found that the balance available for laying out the garden was totally inadequate for the purpose, with the consequent result that the garden was in a large measure a failure. When interests are divided one is prepared for this kind of thing; but if one realises that half of the money spent on, say, the barge boards, finials, and bristling insincere ornamentation would have given you some chance in the garden, one cannot help regretting the absence of some controlling master mind who, with perfect unanimity of purpose and comprehensive grasp, had had the spreading of the money over the larger area to the ultimate satisfaction of both architect and client. Now, do not misunderstand these remarks, for I quite sympathise with the architect, who must have realised that in the incapable hands of the jobbing gardener, who in no wise conceives the house and garden as one composition, the less money allowed for the garden the better, and that it was much better to make the barge board a counter attraction to the monkey-puzzle so carefully planted in the little circle in the centre of the carriage turn. The last consideration under this heading is that if you do not undertake the work it will fall into incompetent hands, or if a competent designer is engaged by the client direct, it is in the majority of cases because he has a reputation for a set form of garden design, or speciality, which, however advisable under the most favourable conditions, may be totally out of place here, but which the proprietor is persuaded, as mankind are by the fables of fashion, is the only correct form under all circumstances, and which, unless the architect can prevent, he is determined to have. There is more than one garden designer in this country who has realised the inconvenience of a prevalent fashion brought about by the dictatorship of some temporarily popular, bumptious, capability Brown, and the expressed disappointment of his client when he proposes to treat the ground in a manner characteristic of the surroundings. Architects, it is understood, in dealing with the ground which are expected to conform to a set of ideas which are well known to be foreign to their profession.

Having given you my reasons why you should undertake the designing of small gardens, I now wish to state a few necessities and qualifications. In the first place, a proper survey with accurate levels is needed, and I can assure you that you will need to lay out a very large number of gardens before you can dispense with this necessary operation, even to the extent of making a preliminary sketch, for to be in any way successful the plan must be arranged to fit the ground and give expression to its contour. You must also be able to judge when ground requires draining; and having decided upon this necessity, be able to arrange it in an efficient and economical way. Judging from many schemes which I have seen for dealing with surface water, I am inclined to think that you could easily spend on land drainage a sum large enough to lay out in a satisfactory manner the whole of the ground. You must know a little about soils; this is a question which troubles would-be garden designers greatly. Now, for the horticulturist pure and simple this is a most important branch of study and research, but for the garden designer there are a few sound rules

which will meet his requirements whether the soil is wet or dry, light or heavy, clay or gravel subsoil; whether the soil lies on limestone or in chalk. If the soil is wet, good drainage should remedy it; if clay, good drainage and the admixture of burnt clay, tannin refuse. Good trenching will usually be beneficial if light and sandy with an admixture of clay or cow manure; as a rule, however, you may say that a dry subsoil is best for a garden.

The first great desideratum is unity and cohesiveness. What is required here is some great controlling power to marshal and organise the petty clevernesses and talents and gifts, and make for and lead up to one ultimate end. The lack of this quality is what makes ninety-nine out of every hundred cities so disappointing when viewed from an eminence, such a motley jumble of points, angles, and pinnacles, style and no style. Almost all our national and municipal, parochial energies and aims lack this Socialistic quality; there is abundant individual cleverness.

But of all matters, says some one, do not interfere with the liberty of the subject in his garden. That certainly is not my motive; but I would, by all the powers of persuasion, try and induce the subject to use his liberty not merely to the gratification of his individual preferences, but to a certain extent to sacrifice these to obtain an aggregate effect; for instance, a fortunate possessor of a house in a city or suburb where vegetation was none too abundant and brick and stone largely predominate, with a fine, walled-in, geometrical garden, faultlessly laid out with neat box-edged beds, vases, and all that goes to make such a garden a success. But in taking a summary view of his surroundings, his eye longs for some counterbalancing mass of green, and to remedy this he sacrifices a part of his garden and plants a mass of hollies or limes or beech to tower above the boundary wall to the gain of the outside beholder, the public, and at a loss to himself. That man is a benefactor to the town and neighbourhood.

In the few architects' gardens I have seen I notice that they usually plant shrubs, both formal and others, in the grass, evidently expecting them to thrive as they do in properly-prepared and tilled borders. This is a mistake, and for several years at the least, until the shrubs are thoroughly established, all grass and weeds should be kept clear of their roots. I know how much better grass looks when it sweeps up to the stems and trunks of the trees or the leaves and boughs fall over in a fringe upon the sward. How difficult it is to convince clients of the dignity of mown grass, and how often do we see the majestic trunks of a fine group of cedars or timber trees muddled up with the inevitable fussy rhododendrons.

It is in the direction of flowering plants rather than shrubs that variety is to be sought after, and for these you must, I fear, rely upon the nurseryman's knowledge of things, simply controlling the shape of the beds and borders in which they are to be planted, and, perhaps, the massing of the few varieties which are essential to the architect's garden, a few of which I will enumerate later.

Now, respecting the planting of hedges, screens, &c., before you attempt to do anything satisfy yourself that what you plant will grow. You may wish for a yew hedge, but it may grow so indifferently in the neighbourhood that you would get more effect out of common privet. Having made up your mind as to the character of the shrub or tree you wish to plant, you will find it comparatively easy to discover whether or not it will grow in the neighbourhood, and if not, what would form the best substitute.

But before we discuss any more technical difficulties we had better consider broad principles, which it is necessary to grasp before arranging your garden plan. I have already stated that the controversy which has been waged between garden designers and architects does not apply to small gardens, for all are agreed on the general principle of formality, although not agreed as to the detail by which this formality should be expressed. The aim and purpose of a small garden, being totally different from gardens of large extent—the former expresses the sympathies, pursuits, and refinements of the home life; the latter, in addition to this, is first and foremost a mark of rank and opulence; the managing head gardener in the one case is the master or mistress of the house; presiding over the other is the skilled horticulturist, whose permission you

lady must ask before she may cut a flower. The small garden is probably the only form of rural pursuit open to its owner, and yields in relaxation and reflection a delightful change to the *sturm and drang* of his everyday existence.

Have you ever noticed in passing to and fro the difference between two gardens, apparently the same soil, and the same aspect? The one seems to have a blight upon it; everything, grass, flowers, shrubs, trees, seem to grow so tardily and sparsely, the shrubs stunted and starved, trees lanky and bare, the flowers shrivelled, scentless and blasted—a reproach to its neighbours; and in the adjoining garden everything is luxuriant and profuse. "Like fruitful trees by a well, whose branches hang over the wall." The flowers seem joyous and radiant; the shrubs healthy, strong, and clothed to the roots with foliage, or bent over with the added weight of foliage or berries; the trees healthy, ever ready to flash out the sunshine after the darkening storm and emerge greener and purer; the ivy, clematis, honeysuckle, jasmine, and roses peep in at the windows and flower in picturesque masses; the grass does not cake or languish, and burn in drought, but yields to the eye that refreshing, restful, compact aspect so desirable. But what is the reason for this contrast—the difference? You would be able to tell me almost at once if there were two adjoining houses in a correspondingly opposite condition, both apparently built with the same hand and with a corresponding amount of care—the one looking singularly happy, "Suitably received into the bosom of things," as some one has said; the other, in spite of suitable window adornments and owner's care, looks decrepit and unhappy. Your trained eye would at once glance at the unlevel joints, the slightly irregular ridge, finials, and chimneys, and other lines slightly out of the perpendicular—points scarcely discernible to any one else—and pronounce the verdict, "Bad foundations!" The foundation failure: unprepared soil is the cause of almost all garden failures. You may procure the choicest shrubs and flowers, manure the borders, roll the grass, but if the soil is not of sufficient depth, and is not properly prepared it will be of no avail. A grass lawn, a flower border, the root space for trees or for shrubs, all need their proper depth of soil and their own especial preparation, nor is it safe to trust the horticulturalist to do what is right in these matters. I have repeatedly seen gardeners laying turf where it was desirable to have a good tennis lawn with only 3 in. of soil, excusing themselves by saying that the grass would grow finer. I need not, however, enlarge upon this, as you will be doubtless familiar with the excuses for scripping put forward by the builder. By all means save and store all turf and soil from the diggings and the foundations. For a flower border (and in the limited area devoted to flowers in most suburban gardens the expense would not be great) it is a good plan to lay, at a depth of about 2 ft., a layer of broken brick or some absorbent material, provided that the soil water drainage level is deeper; then to overlay this with a covering of ashes, and then to overlay this to a depth of about 21 in. with soil of desirable lightness; if too heavy should be mixed with sand, and should have abundant vegetable matter and fibre in it, such as the decayed turf from close green pastures yield. For trees and shrubs a depth of from 1 ft. 6 in. to 2 ft., with a plentiful admixture of the fibrous turf loam, though it need not be so richly manured as the flower border. Grass also requires a depth of soil not less than 3 in., with a well-drained bottom, properly prepared. Of course, as before stated, different soils, heavy or light, clayey or sandy, require different treatment, but although the first outlay may be greater, it is cheapest in the end to lay a sound foundation. "Prevention is better than cure."

Of course it is necessary to know what to plant, and herein is the most difficult problem with which you have to deal, and I venture to think that very few of you will ever master thoroughly the technicalities, nor is it desirable to understand all the hybrids and the eccentricities of the nurseryman's catalogue. At the same time, I think you would soon realise how few varieties of trees and shrubs are required for making a small garden beautiful. The present day tendency seems to be to cram in as many un-English varieties of trees and shrubs as possible, notably rhododendrons and common laurels, and aucubas, &c., their big

polished leaves entirely out of scale with our sober harmonious box, holly, and yew of our predominating northern grey skies. It is the preponderance of such things that make town suburbs, town cemeteries, and town parks so disappointing. I oftentimes think that the quiet spacious dignity of the Harrogate stray would be preferable to many of the tortured, hillocky, unnaturally planted, parks nowadays so common.

In a large garden there are many things great and small which are considered necessities: some beautiful in themselves, others difficult to classify and adorn and harmonise with an all-pervading sense of true garden effect. There are the tennis lawn and summer house; the rose border where, too often, size of flowers seems to be the chief attainment, lanky bare sticks through more than half the year, the roots covered with untidy manure, from which the eye instinctively turns to find delight in the rich green of the despised herb border of parsley and sage. The greenhouse, where can be grown geraniums and decorative house plants in winter and also in spring, and also grow tomatoes in the summer and show chrysanthemums in the autumn; the little garden frame which ensures a supply of sweet violets throughout the winter months; a potting shed, also, and garden house, and a paved shed with a big block for chopping firewood when from stress of weather the proprietor has nothing else to do; in fact, so many interests are to be catered for in this class of garden, and such a host of details on which you can exercise your ingenuity for garden effects that, to the man of sense and refinement, make-believes become grossly irritating. What he wants is a purpose-like garden.

There are two considerations I would like especially to impress upon you. First, the desirability of disabusing your mind of your preconceived notions of the art which is said to conceal art; and, on the other hand, the value of plain surfaces and of definite unhesitating lines. In ignoring the latter it is quite true that you may be able to cover your lawn with trees and shrubs from every part of the temperate zone, just as you may fill your drawing-room with all sorts of bric-a-brac; in both cases you may, instead of securing a sense of restfulness, succeed in giving them an aspect of fustiness. In laying out definite lines you may not get quite so many of those little surprises so much sought after in gardens, and you may not even be able, by the exercise of a little trick, to make your neighbour's garden look as if it belonged to you, but you will be saved the humiliating knowledge that your garden is a fraud, and that your visitors are sure to find it out.

So much depends upon locality, materials available, and the importance of the house, and the amount of money at your disposal, that the question of fences cannot be profitably discussed in this paper; but I would like to say that split oak, which lends itself to such a variety of treatment, is at once one of the simplest and at the same time one of the cheapest forms of fencing, and I would suggest that if we could in this country use, in conjunction with this fence, the trained lines of limes and laburnum as they are used in Holland and France, we could obtain some delightful effects. Holly is, of course, an admirable hedge shrub, so is beech and thorn, but in each case the wished-for effect is slow. Privet makes a hedge very quickly, but it must be out of the reach of horses and cattle, which are very fond of it. The fence which is least permanent, and least desirable, is the strained wire or iron hurdle.

We may now consider more fully the placing of the house on the ground so as to make the most of the ground. Where the extent of ground is strictly limited, as is invariably the case when you are building a small house, the greatest mistake you can make is to cut up the ground too much with drives, &c. This point cannot, in my opinion, be too strongly insisted upon. If your site is well chosen, the public highway will be along the west, north, or eastern boundaries, preferably the north, and just as you would, for the sake of aspect, arrange your living rooms from east to west, so you should see to it that you have as much land as possible on these sides. Now I hold an opinion, which I must admit is at the present time, even amongst architects, very unpopular, viz., when the plot does not exceed, say, two acres, drives are seldom needed, and that every real requirement can be met by a simple carriage-court connecting directly with the high

road. This court you could probably enclose and pave for a less sum than you would otherwise spend on the drive. If the stable could be arranged to the west side of this court and the small kitchen garden, kitchen offices also arranged to this side, you would then have all the more ground at your disposal on the sunny side of your house. Plan No. 2 will give you some idea of the effect which can be obtained by a simple square court such as I have advised. Where the plot of ground is under half an acre it will be seldom that even a carriage-court can be arranged with advantage, but in Plan No. 1 I give you an example in which the court arrangement will be the making of the place; on the other hand, there is no court or drive to the house shown on Plan No. 3, two garden photos of which I propose to show on the screen directly. Where a drive is really necessary, make it as direct as possible. If the ground is fairly level and the junction with main road is convenient, a straight road, treated as an avenue, would give the best effect; but if the ground is rising and of irregular contour, then perhaps a curved drive would be the only one possible. There is something very pleasing in following the sweeping lines of a drive or walk encircling the base of a natural knoll or mound, and this has probably led one branch of the modern landscapists into manufacturing hillocks and mounds in order to multiply his curves and wriggles.

Above all things, do not make your gardens too large. Remember that perfect keeping is the soul of a small garden. I can assure you that you will have considerable difficulties with your clients on this score. Find out if you can what labour your client intends to employ. If a man only two days a week, a quarter of an acre would be sufficient; if he can employ a man and a boy, the garden might be as much as one and a half acres, or, if no glass, as much as two acres. You ask what I shall do with the remaining portion. If you have sufficient for a paddock for the pony you could not put it to a better use, and in any case you can never go very far wrong in planting an orchard; in fact, I always look upon an orchard—with its grass from late winter to spring broken up with colonies of snowdrops, crocuses, and daffodils; the trees in spring covered with masses of bloom; and, later, the boughs bending under its rich loads of fruit—the most delightful part of the garden. You also invariably require to plant for screen and shelter, and this alone would reduce the amount of ground to be kept under cultivation. There is also the arrangement of the wilderness, or wild garden. A piece of ground planted thickly with silver birches, beech, oaks and Scotch firs, hazel, dogwood and the spindle-tree and the savin, with spaces left for daffodils, wood hyacinths, foxgloves, and Solomon's Seal, having a meandering path running through it, or, which I think still better, a broad grass path with heather, vacciniums, mahonia, gaultherias, and other suitable flowering shrubs forming a border on either side, or, if very much shaded, with masses of fern and bracken on either side.

If your site has been well chosen, the ground will slope away from the house; if it does so in a southerly direction, you will have a very sunny garden. This fall of ground suggests terracing, an operation which in a suburban district requires much more careful arrangement and adjustment than would be the case in open country, where, as a foreground to charming distances, the balustrade serves as a frame or setting. In the case under consideration the eye should be induced to rest on the garden. Now there are roughly three ways of terracing—by walls, by grass slopes, and by planted slopes. Of the three, walls are the most satisfactory. A balustrade and expensive stone dressings are seldom appropriate to a small garden, except the house be severely classic. Terrace walls—maintenance considered—are probably the least expensive, and, to my mind, should never be built as if they were to remain naked. I can never think of a wall as so many yards super of Ruabon or Accrington bricks, but as a wall of the most delightful greenery. If you are in a brick country, any good hard brick the colour of which approximates to that of the house would answer; if in a stone country, rough rubble; and if possible the pointing omitted, so that toadflax, houseleeks, &c., could grow in the crannies; the coping, if dressed, to have very simple mouldings. The view of houses belonging to my brother and myself will give you

a better idea of what I mean by rough walling. The wall will cost under 5s. per yard super, and I think looks just as well as if we had spent three times the money. Grass slopes are practically impossible if the batter be less than 1 to 2, allowing step of 12 in. by 6 in.; but whatever batter you adopt for one bank should apply to the whole of the slopes in that part of the garden.

Planted slopes such as the one at Rydal Mount are very charming, but the great drawback is that you have to wait many years for the result. You can, however, obtain a very effective planted slope with mahonia, which, if fairly successful, will completely clothe the bank in two years, and also by planting *Cotoneaster microphylla*, which would clothe the ground in the same time. The one point to bear in mind when laying out batters is to avoid diminishing lines, as, for instance, when you make a sloping walk at the end from the upper to the lower terrace. In deciding the width of your higher terrace, you will need to bear in mind what I have said about cutting off the view of your ground below. Do not shorten your ground. Nothing gives more character to a garden than the form, arrangement, and quality of its grass lawns; and nothing is more refreshing than to look out of your room window on to a lawn perfectly formed and kept. To secure this perfect form is, I admit, a difficult task. I have often felt thankful that a tennis or croquet lawn was considered a necessary part of the scheme, and wherever possible I place this in front of the most important windows; or, if this is not possible, to so place it that a pleasing vista may be obtained across it. The terrace next to the house should be treated simply, but with a certain amount of colour from flowers, and certainly have a border next to the house in which to grow climbers. I am fond of broad paved walks on terrace next to the house, with a few quaint shrubs either planted permanently in beds or set out in tubs. Avoid the usual pattern of broad-brimmed vases filled with lobelia, echeveria, and calceolarias; green or oak tubs or big flower-pots are far better, and if filled with free-flowering green-leaved scarlet geraniums, hydrangeas, or *Fuchsia gracilis*; but do not have too many even of these.

If a garden is very small, I would advise the flower-borders being long and continuous, as in this way you get a much better display of bloom, especially when the borders run outwards from the house; and if the borders are arranged on either side of a walk, as in the summer-house walk which forms one of the series of photos for the screen. If this walk can be arched at intervals with honeysuckle, clematis, or roses, and the end finished with a seat or other suitable object, with yew or other suitable snug background, I know of very few garden effects which can surpass the one which might thus be produced.

Small panel gardens, such as you would wish to look upon from your entertaining room windows, invariably produce the best effect when in beds of the simplest design and at a lower level than the house. Such gardens, as a rule, should be perfectly level, and have some kind of boundary fence round them; this may be simply a low box edge, 2 ft. high, or a low trellis. In some cases it might with advantage be designed as a sunk garden, with grass slopes and steps at the corners or at each side; if on the same level as the rest of the ground, the flatness might be broken up by having a sundial or lead figure in the centre. For breaking up the remainder, you might plant golden or common Irish yews, golden mop-headed yews, standard Waterer's hollies, or even standard snowball trees.

According to the measure of the exact symmetrical balance secured in the house (though, as a garden designer, I do not desire to see any of those square box-like early Georgian erections so difficult to garden (or) so ought the disposition of the features on the terrace so to be: grove to balance grove, and tree to balance tree, though not, I hope, carried to the point of having a greenhouse on each side of the garden, necessitating two heating operations and two objectionable chimneys, as shown in a recently-published design; such attempts end in the ridiculous. If perfect balance you must have, and if you wish to emphasise this balance by some erection, choose a pair of garden houses, one for use as a tool-house and the other as a summer-house; but if balance is secured by the freer and more picturesque methods adopted by the majority of modern architects of coupling and grouping of gables,

chimneys, porticos, oriels, and the like. Balance ought to be secured in the gardens by similarly free measures. You would, whilst securing balance, obtain much greater variety.

One of the most awkward and expensive pieces of ground with which you will at any time have to deal is that in which the house does not follow the natural contour of the ground, but falls slantwise across the garden front of the house, thus giving you a bank of earth on one side which is many feet below the floor level, and on the other side banks of earth standing high above it. I am afraid that in the small plot you have little chance of compromising, but on the larger site I think if you had the garden to lay out, you would at times be able to devise some means by which a happier result could be obtained. Where you have a subsoil which is easily removed, such as soft sand, an alteration to the natural features may be more easily carried out than a modification of the plan of the house.

Although I have a great preference for walls when the ground slopes from the house, I prefer grass slopes when on the south side the ground falls towards the house. In this event an effective garden is very difficult of attainment, and unless very carefully managed you will succeed in giving a very damp, tank-like appearance to the place; the more your ground slopes away from the house, the more will you feel the necessity for plantations; but the reverse holds good when the ground falls from north and south towards the house. Bright colours from flowers, and occasionally trimly-trimmed trees to mark distances, if you like, but no general scheme of plantations. If the ground is treated formally, you should start with a piece of level ground as wide as you can make it, and instead of doing the entire break in level in one lift, divide into two or three levels as the case may require, allowing a sufficient width to allow of a few flower beds on each.

I have earlier suggested a portion for the kitchen garden; but apart from actual convenience for working I really cannot see much objection to its being placed in any position, provided it can be treated as a part of the scheme. I maintain that some of the most charming gardens I have ever seen have been kitchen-gardens. In Scotland more particularly you will often find a beautiful old kitchen-garden which sometimes excels the pleasure-garden, and I would not even mind if the living-room window looked right down the central walk.

You will notice that I have hitherto said nothing about the effects which can be obtained by the arrangement of water. My reason for the omission is because there are so few gardens in which, owing to the cost of water supply, this luxury is available. I would point out, however, that a small wall fountain with its one falling spray judiciously placed at the end of a walk, or a small circular basin with a central jet, are often most charming. Even where this is not possible, it is often possible to have a small pond in which to grow water lilies and water hawthorn.

The last detail to which I wish to refer is the planting of the flower borders, in connexion with which, I may add, I rely almost entirely upon hardy perennials and those of the hardiest varieties. To go in for what is popularly known as bedding-out is to adopt one of the most expensive kinds of gardening; there are, however, a number of annuals and biennials, which are most useful for filling-up blank spaces. Amongst these I need only refer to stocks, candytuft, sweet alyssum, mignonette, wallflowers, snapdragons, Canterbury bells, sweet rocket, forget-me-not, and penstemon. I would also allow bunches of scarlet geraniums, heliotrope, and verbenas. Amongst the perennials, hollyhocks (single or double), phloxes, dolphiniums, campanulas, lychnis, pinks (especially the common white) carnations, tufted pansies, and Michaelmas daisies should be planted in groups, the greatest care being exercised to secure effective groupings and continuous show of flowers throughout the greater part of the year; excepting on the outer edge of a border, where a continuous line of one thing, such as pinks, may look very effective. Avoid planting in lines, but rather try to secure a little irregular colony of each plant. If you intend to successfully cope with this most important branch of garden making, I would advise you to make the acquaintance of a nurseryman who has a good collection of hardy plants, and to visit his borders once a fortnight, making careful notes

of the plants in flower at the time, their colour habit, and height.

After all the advice I have given you I can imagine some of you will yet decide that the subject is too big, or that the advice has come too late. If so, as one who loves a garden, let me suggest that when commissioned to design a house, in connexion with which there is to be a garden, that you should seek to co-operate with the garden designer from the time you prepare your first sixteenth-scale plan, and to agree on some mode of treatment of those parts of the scheme where there is an overlapping of interests, and on the successful treatment of which depends in no small measure the success of the whole scheme.

In one of the most recent reviews of my book I am told that I lack fire and poetry. Now, I have fortunately realised, and I think it was probably due to Mr. Sedding's delightful book, "Garden Craft," more than anything else, that a man engaged in the design of gardens was in danger of holding a position analogous to that of the lover in being more sentimental than practical. I have therefore endeavoured to avoid rhapsodical sentences on the one hand, and, on the other, of giving you a series of cut-dried garden designs. I have tried to give you a series of hints which would help you to do the designing.

THE SURVEYORS' INSTITUTION: FUTURE OF THE LONDON WATER SUPPLY.

A MEETING of the members of the Surveyors' Institution was held at 12, Great George-street, Westminster, on Monday evening, Mr. John Shaw (President) being in the chair. The sole business of the evening was to resume the discussion on the paper by Mr. R. E. Middleton, M.Inst.C.E., on the London water supply, read at the preceding meeting, and printed in our issues for December 15 and 22.

The secretary (Mr. Julian C. Rogers) announced the receipt of a communication from Mr. Shaw, of Boston, Lincolnshire, bearing on the subject. In this Mr. Shaw pointed out that the population of London, and the amount of water per head to be supplied, had increased by leaps and bounds during the last quarter of a century, and while believing that with the supply at 30 gallons per head there was at least 10 per cent. of preventable waste, the water engineer of to-day might easily push back the rate of consumption per head to what it was twenty-five years ago. The quality of London water, both in the raw and the finished material, had enormously improved. The sanitary improvements in the towns and the villages above the intakes, the beneficial results of the supervision of the inspectors appointed by the Thames and Lea Conservancy Boards, had improved the raw material out of all proportion to the slight deterioration which the increase in population in such districts had tended, and the improvement in the work and the filters had provided a very high-class water. The writer agreed with the author in regarding the River Thames as the sheet anchor of the London water supply for many years to come.

Professor Robinson addressed himself to the utilisation of the Thames for the future water supply of London in a different way to that advocated by Mr. Middleton. He was of opinion that the right way to deal with the matter was by the construction of impounding reservoirs in natural valley tributaries of the Thames. Both Lord Balfour and Lord Llandaff's Commission agreed that 300,000,000 gallons a day from the Thames, leaving 200,000,000 as a minimum to go over Teddington weir, should be the basis. It was many years ago that he came to the conclusion that the solution of the question was in impounding reservoirs. He laid his views before the Balfour Commission, and since that report was issued he had continued his investigations and had come to the conclusion that an impounding reservoir for 15,000,000,000 gallons could be constructed at a cost of 850,000, and a storage reservoir for 55,000,000,000, at a cost of 1,610,000. By the construction of a reservoir of that magnitude the flow in the Thames could be maintained at 600,000,000 gallons. He also went beyond that and ascertained that a reservoir could be constructed at the cost of 2,400,000, which would give a flow of 700,000,000 gallons per day in the Thames. These figures had been arrived at within the last few years—since, in fact, Lord Balfour's Commission sat, and they could be taken with a full sense of responsibility and as capable of

being proved at the right time and in the right place. Discussing the conclusions arrived at by Lord Balfour's Commission, Professor Robinson said he was not convinced by Sir Archibald Geikie's evidence as to the difficulties on geological grounds, nor of those attributed to the "flow-off" and the flood water. In the ten years that had elapsed very much had been learnt on the latter point. To sum up his ideas, what would be the effect of the impounding reservoirs? It would preserve a uniform flow in the Thames, it would enable the pumps to work advantageously, the Conservancy would obviously favour it, because it would be better for navigation and hygienic purposes, the water delivered to the intakes would be in a better condition, the filtering beds would be less taxed, and the interests of both the consumers and the water companies would be better served. So far as the water companies were concerned it was desirable that this scheme should not be ignored, for when it came to the question of purchase after the Water Boards had been formed, it would be found very much to the interest of the water companies if they could point out that by the expenditure of 2,000,000l. the public could be served equally as well as by the outlay of five times the capital. He had no hesitation in saying that the more the impounding system was investigated in the spirit of pure research the more would his views be confirmed.

Mr. H. H. Statham said he was anxious to say a few words about what he considered the totally inadequate ideas prevailing as to the quantity of water per head required by the Metropolis. Until there was a sounder idea upon that point the seriousness of the problem would not be properly appreciated. The fact that at this time of day we had a necessary of life served out by private companies, whose interests were the shareholders' and not the public's, was an anomaly so monstrous that he was surprised that public opinion had not arisen ere this against the system. He was not going into that subject; but one effect of that system was that water engineers had got into the habit of thinking of water as a substance to be dribbled out in the smallest quantities, and with them, the problem was not how much to give per head, but how much consumers could be screwed down to. The most preposterous example of that was a letter to the *Times* by a venerable engineer, who laid it down that with proper care the supply could be reduced to 25 gallons per head. This was calculated to carry their minds back to the "antediluvian period," when people took a bath on Saturday nights only. Of the bearing of baths upon public health there could be no doubt. When he first came to London, an eminent physician gave him two pieces of advice—one of which was to get *into* water every morning. He was emphatic upon that; that total immersion was what was really required in a bath; and to regard that as "waste of water" was simply foolish. On measuring the quantity the other day, he found that in the ordinary bath the amount of water for total immersion meant between 60 and 70 gallons, and if this was such a desirable thing in point of health, what became of Mr. Middleton's 35 gallons per head? But even if they left alone the total immersion and gauged the amount used in the upper-class houses, they would find it amounted to far more than 35 gallons. For himself, he considered 50 gallons the very least that should be thought of. The answer might be given that there were a large number who used hardly any water at all for ablution, and the surplus could go to those who wanted it. That he called a most immoral argument. It meant that because the lower classes were dirty they need not give them water. His contention was that they were bound to give them a chance to have a bath. But the fact was that, as education progressed, the more people learned about the conditions of health, and the more they came to understand that a copious use of water was desirable, the more they would require. Then, as to waste, it had been said that if the water supply was in the hands of a Governmental or Public Authority we should be far more controlled than we are under the water companies. On the contrary, he thought no system of administration would have the same interest in stopping so-called waste of water as the companies had. In Birmingham the municipality supplied both gas and water, and he may recently described their policy as endeavouring to run the former at a profit,

but not the latter, because it was a necessary of life, and should be supplied as copiously as possible. But they would always be liable, as long as waste was checked by house-to-house visits, to be subjected to widespread irritation amongst consumers, and this system was open to this objection—that they did not get justice, because the officials employed on the visitation were always in a hurry, yet were anxious to justify their existence by reporting everything that was wrong—and more. He spoke thus from experience. When he came home one day a notice awaited him notifying half-a-dozen defects. He wrote to say who he was and challenging the statement, and their superior officials were sent who made a more careful inspection. Eventually the company admitted that four out of the six requirements were unnecessary. What was the remedy, then, for useless waste? He replied, supply by meter: that was a common-sense logical conclusion to his mind. With the supply checked by meter they made the householder interested in the amount consumed, and he would naturally see that the taps did not leak. They would, moreover, avoid that irritating visitation from house to house. Every one would pay for what he used, and the poor man who did not use very much would not pay for what the rich man used. The only valid objection he knew of was that the lower classes might be seized with a desire to economise and avoid washing altogether. That difficulty might be met by putting houses at a very low rental on a rating basis. Unquestionably, however, service by meter was one of the most effective systems for checking unnecessary waste—the meant real waste and not the copious use of water. But what he wished to urge was that water supply should be copious, not meagre and restricted. It was even more important in a great crowded city like London than in those American towns which supplied from 100 to 140 gallons per head. Those places, instead of being extravagant, were in advance of us in their notions of sanitation and civilisation, and instead of scoffing at them we should follow their example as nearly as we could.

Mr. Hassard, who remarked that he was the designer of the Welsh scheme now under consideration by the London County Council, said he desired to discuss probabilities as to the population and the amount of water received by the metropolis fifty years hence. The population of the metropolis at that time had been variously estimated by Royal Commissions and experts at from 15,000,000 to 30,000,000. He, however, regarded these figures as entirely illusory. He did not think the population in 1951 could possibly exceed 12,000,000, if, indeed, it reached that. Allowing 35 gallons per head per day, they would thus require 420,000,000 gallons daily—a supply which the Welsh scheme was fully capable of meeting, at a cost of about 38,000,000l., or about 3l. 4s. 6d. per head of the population. As regards the quality of the water, that now supplied to London he believed was of 18 deg. of hardness. This, however, was not such as should be supplied to the metropolis of the world. The Welsh water was very soft—something about two degrees of hardness—but he did not advocate the use of water of such soft quality. A higher degree of hardness was more pleasant to drink and was equally suitable for all purposes of trade and manufacture. In his scheme the difficulty was met by the incorporation of 30,000,000 gallons of the most beautiful water from the oolite beds of the Cotswold Hills, and which could be carried by gravitation into London. If the 38,000,000l. he had referred to were borrowed for fifty years the whole capital would cease at that period, and on a 3 per cent. basis this great supply would have been brought to London at a cost of 2½d. per thousand gallons, or, upon a 2½ per cent. basis, at 2½d. per thousand gallons. The idea that the Welsh scheme would involve ruinous taxation was quite unwarranted.

Mr. Vernon Harcourt (Oxford) said he feared that Mr. Middleton had scarcely treated the question in the spirit of free inquiry. His paper was mostly an argument in favour of the Thames as against any other source of supply, and even when speaking about that spirit of free inquiry, he declared that it could be proved conclusively that the bringing of water from Wales would mean a supply no better in quality than that drawn from the neighbourhood of London and would be very much more costly. Whatever demerits there might

be in the Welsh scheme, he (the speaker) did not think anybody would care to say that the water from the Principality would not be preferable to that from the Thames. Professor Robinson mentioned that there were some valleys in the Thames basin which could be used as impounding reservoirs. He (the speaker) did not know which valleys were referred to, but he had occasion years ago to survey most of the tributaries of the Thames, in fact, all above Oxford, and there were very few of those, irrespective of geological formation, which would have been satisfactory as impounding reservoirs on account of the small fall of the rivers. There was, perhaps, one exception—the river Chalon, which flowed in at Oxford. He agreed with all that had been said about preventible waste—not waste which arises from having baths—but the waste in which taps were allowed to run continuously. The population question was a difficult one. Mr. Hassard was right in saying that all conclusions arrived at were based merely on assumptions. What seemed to him to be a cogent fact was that the birth-rate in London was not increasing, yet it was impossible to gauge what would be the possibilities of the influx into the metropolitan district by 1961. The author of the paper seemed to think that if the supply was sufficient to meet the wants to 1961, London might then be allowed to look after itself. There were two points to be considered in this connexion. One was—How far could they have a large population on the river and in the valleys from which the water supply was drawn, with their inevitable sewage farms and effluent always flowing into the river above the intake, without incurring some risks? Another point to bear in mind was this—Although they might tap the Welsh watershed now they might not be able to do so in 1961, when the necessity for it would be more urgent. By that time, possibly, some other town might have appropriated that source. What would London do then? Mr. Baggallay, O.C., feared that the discussion was digressing from the main point at issue. The question was rather, What was the necessary quantity of water required to supply the population adequately, and not the discouragement of waste. Nor was the question of the supply of water by meter to the point, though he was bound to point out, now that it had been mentioned, that the system had been tried at Norwich, and was found to be a premium upon dirt and nothing else. Those who had the control of small classes of property were induced to reduce the supply of water to their tenants to an irreducible minimum. There was also a Bill brought in and backed by Mr. Causton among others, but it was withdrawn as impracticable. The main point raised by the paper was, as he took it, this:—Is it, or is it not, right that London should use the two rivers which nature had caused to flow through her before she went elsewhere? Two things controlled that question—one was the cost of the utilisation of what was at her doors, and the other was that of the sufficiency and the quality of what water was there. With the run over Teddington Weir, in one week's rainfall an adequate supply could be obtained for London for a whole year. It was purely a question of the cost of storage, and he held that reservoirs could be constructed wherever wanted without the enormous cost of going to Wales. Waste had been the curse of London for many years, and he hoped a serious endeavour would be made to restrict it.

Mr. Lucas thought it idle to suggest that such an aggregation of human beings could crowd the metropolis as had been suggested. There was a limit to all things, and in an able paper read some years ago before the Statistical Society by Mr. Pryce Williams, he showed that when the population of London reached 8,000,000 the breaking point would be reached. For himself, he regarded that part of Mr. Middleton's paper dealing with the population as a dream. In the discussion the question of the purity of the water seemed to have been ignored. He had found that when the Thames was at its lowest London was taking half the flow. When the population was doubled it would, as a consequence, take the whole, and if any pumping was to be done from the Thames there would be only mud to pump. Moreover, the time would come when the population on the banks of the Thames would be so great that the purity of the water must suffer. He was convinced that the time must come when

London would have to go to Wales. They had gone for many years to the Thames, and the river had served them well, but there could be no denying the urgency of a new source.

Mr. Ashton Hill (Birmingham) said the subject of the metropolitan water supply was one of the keenest interest to country water engineers, and they were watching closely to see whether London would seek an augmented supply at home or from Wales. Mr. Middleton had proved an able advocate of the home scheme, but, excellent as the paper was, he was not convinced. His argument was—Why should we go away when we have a good supply close at hand? But Mr. Middleton acknowledged that London would have to go to some distant source in, say, half a century. If this be true now, they could not begin too soon for the construction of necessary works would certainly occupy fifteen years, added to which would be another five years for preliminaries in getting powers, &c. That meant that by 1911 it would be necessary to go in for this distant scheme even if London got from the Thames valley all the water that Mr. Middleton said he could get. Having had long experience of deep-well water supply, he doubted if they could get so much as was indicated by Mr. Middleton from that source. He proposed to raise 381,000,000 gallons per day from wells alone. He (Mr. Hill) thought he must be a sanguine engineer to believe in such an enormous quantity from such a source. His pumping scheme seemed to him unworkable, and not justified by the experience of the past. On the other hand, the Welsh scheme involved no uncertainties, and by carrying out such a scheme, London would have entirely independent strings to its bow, and there was no doubt about the ability of engineers to bring it to the metropolis. If Liverpool, Glasgow, Manchester, and Birmingham could afford to carry out a scheme of gravitation, surely London would not be deterred from having the best scheme possible merely on the score of cost.

Mr. Cowper Coles, as an agent from the Welsh watershed, said he was afraid the question of compensation had not been sufficiently considered by the engineers. The Wye area was already burdened with a Birmingham scheme, and if London came to the same river for its supply, the remainder of the western area would be drained. This would have a serious effect upon the salmon fishing of the Wye, which was the largest net-salmon river in Wales, England, or Scotland. Estates were sold on the increased value attaching to this privilege. The speaker also pointed out that Welsh water had a peaty taste—to verify which they had, he said, only to ask a Liverpool man what he thought of it.

Mr. Morris remarked that, as so much depended on the future population of London, it would be well to take up the several schemes in blocks, so that there should not be a waste of public money.

On the suggestion of the Chairman, the discussion was, at 9.45, adjourned for a fortnight.

SCHOOLS, SNEYD GREEN, BURSLEM, STAFFORDSHIRE.—The new schools which the Burslem School Board have just erected at Sneyd Green have been built on a site containing 5,000 square yards with a frontage to the main road at Sneyd Green of 88 yards. There are two blocks of buildings, the main block being for the accommodation of the boys and girls, and the second being for the infants. The larger block comprises a central hall 51 ft. by 36 ft., which is lighted from one side and from the roof, and six classrooms, each 25 ft. square, in each of which sixty children may be seated. All the rooms are finished with concrete and wood block floors, glazed tile dadoes, picture rails, plastered walls and ceilings, and wrought iron gas fittings, and in the classrooms are galleries of three tiers. Warmth is supplied by means of hot-water, and ventilation is effected through Tobin tube inlets and roof extractors. The windows are large and in every room additional left-hand light is secured. Similar in construction is the infants' department. In this case, however, the central hall is smaller, being 45 ft. by 28 ft., and there are four classrooms measuring 25 ft. by 22 ft., giving a total accommodation for 300. Adjoining the schools is a caretaker's house, and there are extensive playgrounds which are asphalted, and covered play sheds. The general contractor is Mr. J. J. Longden, of Burslem, and the sub-contractors are Messrs. T. W. Eardley (plumbing and glazing), H. Barber (stone work), Truswell & Sons (heating), W. Durose (ironwork), and Bennett & Sons (furniture). The cost of the building and its equipment will be about 8,200l. The site has cost 1,100l. The whole of the work has been executed from the designs and under the direction of the Board's architects, Messrs. Wood & Hutchings, of Tunstall.

COMPETITIONS.

PORTSMOUTH TECHNICAL INSTITUTE.—The Portsmouth Libraries and Museum Committee have selected the plans for the new Technical Institute, which is to be erected at the back of the Town Hall. Three premiums had been offered, 100l., 75l., and 50l., and Mr. Cross, of London, was appointed the assessor. There were six competitors, and their own estimate of the cost of the work ranged from 43,000l. to 55,000l. The assessor's lowest estimate was 49,408l. He awarded the first premium to Mr. C. E. Smith, of Victoria-road North, Southsea, whose estimated cost of the building was 43,086l. The assessor's second award fell to Messrs. Rake & Cogswell, Prudential Buildings, Landport, their estimate being 44,600l., and the third to Mr. W. C. Bevis, Elm-grove, Southsea, who estimated the work at 43,000l., though the assessor's estimate on the same basis was 48,610l. The other competitors were Messrs. A. E. Guy, of Albert-road, Southsea; C. Ball, Kent-road, Southsea; and J. W. Walmsley, of King's-terrace.

PRINCE'S PARADE, BRIDLINGTON.—In the recent competition for extension of 1, Royal Prince's Parade, Bridlington, the first premium, of 35 guineas, has been awarded to Messrs. Mangnall & Littlewood, 42, Spring-gardens, Manchester. The second premiated design was by Mr. J. Freebairn Stow, Corn Exchange, Exbridge. The other competitors (as given by a local journal) were Messrs. Wood & Frenching, London; Messrs. Beal & Shepherdson; Mr. S. Dyer, Bridlington; Messrs. Shepherdson & Beal; and Mr. Matthews. The plans selected provide for an iron pier and promenade with a pavilion to accommodate 3,000 persons. The estimated cost is about 28,000l.

BRIDGE, SYDNEY.—The premium of 1,000l. offered to the engineers of the world for the best design for a bridge to connect Sydney with the North Shore has been awarded to Mr. E. Crutwell, engineer, of Westminster. The tender sent in with the plans by Sir William Arrol, the builder of the Forth Bridge, was for the amount of 2,927,230l. There were twenty-four tenders sent in from all parts of the world, the lowest being for 991,870l. The Board of Examiners, it is stated, considers the whole of the plans disappointing, and not one is recommended for adoption.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—A lecture on "The Housing of the Working Classes" was given before the members of the Sheffield Society of Architects and Surveyors by Mr. H. Potter, at the School of Art, on the 10th inst. Mr. J. Smith presided. In introducing the subject, the lecturer said he did not intend to discuss the social or political side of the question, but to touch on the difficulties that architects had to contend with in recognising the natural requirements made by owners as well as tenants, and to see how they could best serve the interests of both, the latter quite as much as the former, by giving the owner a good security for his outlay, and the tenant the best accommodation possible for the rent he has to pay. In providing dwellings for the working classes, one of two methods was generally adopted, either to build blocks of four or five storied tenement buildings in the centre of a town, or to erect cottages in suburban districts, to accommodate one family only, or, at any rate, not more than two. He proposed to limit his paper to the consideration of the latter class, viz., small houses to be built either semi-detached, in blocks of four, six, or eight, or even in larger terraces. In a locality with a large working-class population earning good wages, there must be a steady demand for this class of residence, and owing to the existence of an excellent service of electric trams and cheap fares, Sheffield possessed one of the best aids for solving its own housing problem, for by this means there was easy access to the suburbs, enabling a working man to live where he and his family could enjoy a house and a reasonable space of ground to themselves, pure air, and be within easy reach of the country, instead of in a suite of rooms in a lofty tenement building, situated in the centre of the city. But there were probably here, as in most towns, a certain number of men who, owing to the nature of their calling, must live in the heart of the business centre, and for these an excellent scheme was now being carried out by the Corporation in the Crofts area. There were many

difficulties to be contended with by architects in designing these houses, which were all due to the important consideration of cost or the rent the occupiers can afford to pay, this being influenced by (1) the frequently high price of land; (2) the increased cost of labour and materials; (3) the adoption of more stringent building regulations by all sanitary authorities. In reference to the last, no objection could be raised to by-laws that tended to check unsound and unsanitary buildings, but architects did feel at times that they added unnecessarily to the cost. In this respect Sheffield enjoyed privileges in two important instances, viz., it was permitted to have two stories and rooms in the roof with a 9-in. external and party wall, and it was not necessary to carry the party walls through the roof for a height of 15 in. After giving some instances, the lecturer briefly referred to some points that arose in laying out estates. He suggested that, instead of large owners and public bodies cutting up the land at the rear of the houses into small strips for so-called gardens, each house might have a small yard, and the remaining land be kept as one large open space for the benefit of all the adjoining houses. With sites 70 or 80 ft. deep, a space 40 to 60 ft. wide could be obtained extending the entire length of the houses, which would form an excellent playground for the children, would facilitate the drainage, give good access to the rear of the premises for the delivery of fuel and collection of refuse, and save the loss of frontage caused by providing for this in the ordinary way. After making a few remarks about roads and the length of time these were sometimes allowed to remain in an unfinished state, the lecturer discussed the planning of these small houses in detail. He referred to a series of plans shown in the room illustrating houses occupying frontages of from 12 ft. to 18 ft., beginning with four-roomed cottages for one family, and gradually increasing in size up to six and seven rooms. Then followed plans for double tenements, representing a class of house for which there is an increasing demand in industrial centres. They consist of ground and first floors arranged in "flats," each having a separate front entrance, and being self-contained in every respect. They meet the requirements of a large class of people who are unable to pay the rent required for single tenement houses, and avoid all the inconveniences that arise if two families share a house that was originally intended to be occupied by one. In conclusion, the lecturer referred to the external treatment of these houses, and in making a plea for a more careful consideration of this part of the subject, showed drawings illustrating the use of different materials in a simple, but effective manner. The lecture was illustrated by drawings. A discussion followed, and, on the motion of Mr. E. M. Gibbs, seconded by Messrs. T. W. C. Fenton, and supported by Messrs. T. Shaw and the chairman, a vote of thanks was accorded to the lecturer. A ballot was taken, and the following gentlemen were duly elected—Mr. H. I. Potter, associate; Messrs. W. A. Forsdike and J. A. Whitehead, students.

ARCHITECTURAL ASSOCIATION OF IRELAND.—An ordinary meeting of this Association was held in the Grosvenor Hotel on the 8th inst. In the absence of the President the chair was occupied by Mr. Walter Doolin, M.A. Mr. M. J. Tighe, in the affirmative, opened a debate, "That the present system of apprenticeship is best suited for the training of an architect." Mr. F. G. Hicks replied in the negative, and a discussion ensued, in which Messrs. Hudman, Lynes, R. M. Butler, Scott, Allberry, and the chairman took part. Ultimately the following resolution was carried—"That, in the opinion of this meeting, the present system of pupillage, concurrent with a compulsory collegiate training and qualifying examination, affords the best promise for the architect of the future."

LIVERPOOL ARCHITECTURAL SOCIETY.—At a recent meeting of this Society at the Law Library, Castle-street, Professor Simpson, of University College, presided, and said that they united in wishing the Society a prosperous new century. They formed the oldest architectural society in the provinces, and claimed also to be the strongest. Their warmest congratulations were extended to Mr. Pearce Edwards upon his appointment to the position of City Architect at Bradford. Mr. Woolfall seconded a vote of congratulation proposed by the Chairman, and it was recorded on the minutes. A paper by Mr. M. H. Baillie Scott, of Douglas,

who was not able to be present, was then read by the Chairman. Its subject was "The Planning of Small Country Houses."

MANCHESTER SOCIETY OF ARCHITECTS.—On the 10th inst., at a meeting of the Manchester Society of Architects, held under the presidency of Mr. E. Hewitt, at Standard Chambers, King-street, Mr. Hugh Stannus, of the Manchester Municipal School of Art, read a paper on the subject of the training of an architect. Mr. Stannus mentioned that since he had undertaken to read a paper on this subject, the authorities of Owens College had made a move forward in their direction, and what he had to say was somewhat influenced by their intentions in the arrangement of his plan into years and sections. He acknowledged some indebtedness to Mr. Arthur Cates, the former Chairman of the Board of Examiners of the Royal Institute of British Architects, who had, he observed, great experience of the necessity and value of the higher education in architecture. It might be asked whether such education was necessary, but in Manchester that question was already answered in the arrangement by principals for their pupils to attend the School of Art for an afternoon in each week. Speaking generally, it might be said that beyond what was termed professional practice, which could be learned nowhere else, there was not much opportunity for the higher education in most modern offices. The principal was too much engaged to afford time to be a schoolmaster, and the senior draughtsman had rather to get work out of the pupils than to pump education into them. No system could be exhaustive, and the end of all the education they could give was to enable the student to educate himself. Should the system be academic or individual? If they could afford one separate teacher to each student then the system might be individual, but in such a case the student lost the advantage of seeing the various solutions of different problems by other minds and the further great advantage of emulation. So far as his experience extended, no student who had any originality in him ever lost it by judicious, systematic training. Hence he thought it better to teach according to a well-considered system during the earlier period of pupillage, and to leave the development of individuality to come in the later stage. In other words, he would generalise in the earlier and specialise in the later period. It had been objected that the academic teaching reduced all students to one dull level of monotony, and that as a result of this a street in Paris was the same from one end to the other, and was not so interesting as a street in London, where every shopkeeper did what appeared right in his own eyes, seeking only to shout louder than his neighbours. He contested the objections, and contended that the street in Paris was not the same from one end to another. Within the limits which had been fixed for the common good, there was a greater variety of artistic detail than in London, for the Parisian architect, having his mind set free from the lower considerations, could devote himself more fully to what, after all, gave the measure of the artist—the arrangement of the features and the details. Further, the academic method of study would bring to the student's mind the strength and the weakness, the applicability and the inapplicability, of the typical treatments that were used in each of the great styles to the different problems of modern building, and when a man had learned what to do without then he was on the direct road to make his own style by the omission of useless details. And as minds varied so would the architecture of our streets. Discussing in detail a chart of studies which he had drawn up, Mr. Stannus said he assumed the length of the course as three years, not because it was long enough, but because it was generally all a man could give. The method of study in the old times at Paris used to be to learn (1) all about construction, (2) all about plan, (3) all about elevations, and (4) mix the three. He would prefer to run these concurrently, to emphasise the fact that architecture was one. In the course of further comment he urged that students should look upon planning as a fine art. He assumed in the chart he drew up that a student would be able to attend on the instruction referred to for five hours a day for five days in the week for forty weeks in the year. The collegiate recognition of architecture was a desirable object in view of the special circumstances of architectural education. He considered, however, that two points demanded atten-

tion—namely, the requirement of attendance at lectures as a condition of granting degrees, and the examinations. With regard to the attendance at lectures, which was possible in the collegiate life and discipline of the older universities, he reminded them that the modern stressful life of Manchester, with its belt of subsidiary cities, killed the monastic ideal and left no place for monastic manners. Still, if attendance was required, he would plead that this should not be enforced for a period of three years from the inception of the system. Further, any student who desired to proceed to a degree during this transition period should be admitted to the examination on proper recommendations. A certificate might be granted to any student who had attended the lectures of one particular section and satisfied the examiner on it, without his being compelled to take the whole course. Thus the system would be made elastic until sufficient experience had been gained. He regarded examinations as necessary at the end of every course, whether long or short. The aim should be to make the education systematic rather than sporadic. While they did not desire to manufacture Admirable Crichtons, they ought to strive to deepen and broaden the education of the architect of the future, so that in his intercourse with his client and the contractor he should hold aloft the ideal of a cultured, practical, and trusted adviser. In replying to a vote of thanks and remarks which had been made by members present, Mr. Stannus said that he thought they would have to reconsider the question of pupillage. Students would go first for academic instruction for three years, or whatever might be the period, and then architects would find their pupils worth more to them. They might be able to take a pupil without any premium at all. The academic system, in his view, should come first, and then the student could go into an office to learn professional work. He thought they ought to welcome the institution by any college of a course which would tend towards the raising of the professional tone, which they all had at heart.—*Manchester Guardian.*

RATES OF WAGES IN THE BUILDING TRADES.

MANY interesting facts, based on statistics officially supplied by various representative organisations, are set forth concerning the above subject in a Report made by Mr. H. Llewellyn Smith to the Comptroller-General of the Commercial, Labour, and Statistical Departments of the Board of Trade, and presented by command of her Majesty to both Houses of Parliament. The Report deals with the standard rates of wages and hours of labour in force in the United Kingdom at the beginning of 1900, and represents the changes which have taken place since a similar Report was issued in 1894. It thus forms a fresh starting-point in the investigation of these important subjects, which it is intended to continue, and of which the results will in like manner be published periodically. Mr. Llewellyn Smith gives interesting explanations as to the meanings attached to the terms "time-wage" and "piece-wage," and he estimates that, taking into account all classes of workpeople, male and female, including those employed in agriculture and domestic service, no fewer than 74 per cent. of the workpeople employed in the United Kingdom appear to be engaged in industries in which time-wage is the most prevalent system. By the "standard rates of time-wage" is meant those rates which are recognised as applicable (usually as minimum rates of pay) to the remuneration of a considerable number of workpeople engaged in a given industry at a given place. "It will be understood," remarks Mr. Smith, "that, while competent workpeople, whose remuneration is governed by a standard rate of wages, are not expected to work—and would not consent to work—for a lower rate, individual workmen, whether on the ground of the possession of special skill or the difficult or dangerous character of the work, may and do receive more than the standard rate of wages ruling for their trade in the locality. On the other hand, workmen who have not yet mastered their craft (improvers, &c.) will not demand or receive the standard wage; and in some trades the arrangements between employers and employed permit of workmen admittedly too old to do a fair day's work accepting wages lower than those recognised as the minimum for the general body of workmen." In certain trades (Mr. Smith goes on to remark), more especially in the different branches of the building trade, the weekly wages of the workpeople fluctuate according to the season. The rates of wages and hours of labour upon which his (Mr. Smith's) returns are based are, therefore, those which obtain in the summer months. The conditions of employment prevailing throughout the winter months are not uniform, distinct

arrangements being made with respect to different parts of the winter season, during all of which, however, the standard hours of labour are shorter than in summer, and in some cases slightly higher rates of time-wages are paid. As between different branches of the building trades the amount of seasonal fluctuation in hours and wages varies considerably, some classes of workpeople (e.g., carpenters and joiners) being employed under cover, and being, therefore, in many cases employed for the same number of hours per week in winter as in summer. With regard to local variations in rates of wages, it is mentioned that in the building trades, while bricklayers, for example, receive 10d. in London and in a large number of other towns, their wages fall to 6½d. in several districts (Stroud, Wisbech, and Bridgewater), and to 6d. an hour, or even less in others, as in Tiverton and Barnstaple. The wages of carpenters and joiners vary from 10d. an hour to 5d. per hour in different districts, and similar variations are shown by the wages of many other classes of operatives. The causes of local variations in wage-rates are at once numerous and complex. As a rule, wages in the same trade are higher in London and other large towns than in the smaller centres of industry. In part, this fact is attributable to the higher cost of living incurred by the workmen, especially in regard to house rent; in part, no doubt, to the fact that on the average a somewhat higher standard of skill is expected in large centres, and that a higher rate of pay once established has a tendency to perpetuate itself by attracting the more highly-skilled workmen. Moreover, in some cases the wider labour market and the greater mobility of the inhabitants of a large town may place them in a better position to demand high pay than those workmen who live in a small town or village, and would have to migrate to a considerable distance in order to obtain work elsewhere. In an appendix particulars are given of the standard rates of wages and usual summer hours of labour (exclusive of overtime) recognised in the year 1900 for the principal classes of building trade operatives in the different towns of the United Kingdom. From this table we extract the figures applicable to a few typical places. Rate per hour for bricklayers:—London district, 10d.; Carlisle, 8½d.; Bradford, 8½d.; Liverpool, 9½d.; Manchester, 10d.; Bristol, 8½d.; Hereford, 7½d.; Potteries District, 8½d.; Shrewsbury, 8d.; Colchester, 7d.; Oxford, 8d.; Norwich, 7½d.; Bournemouth, 7½d.; Brighton, 8d.; Cowes, 6½d.; Portsmouth, 8½d.; Barnstaple, 5½d.; Bideford, 5½d. For masons:—London district, 10d.; London, 10d.; Carlisle, 8½d.; Liverpool, 9½d.; Carlisle, 8½d.; Bradford, 8½d.; Hereford, 7½d.; Manchester, 9½d.; Potteries 8½d.; Shrewsbury 8d.; Colchester, 9d.; Norwich, 7½d.; Bournemouth, 7½d.; Brighton, 8d.; Portsmouth, 8½d.; Barnstaple, 5½d. For carpenters and joiners:—London district, 10d.; Carlisle, 8d.; Bradford, 8½d.; Liverpool, 9½d.; Bristol, 8½d.; Hereford, 7d.; Potteries, 8½d.; Shrewsbury 8d.; Colchester, 9d.; Norwich, 7½d.; Oxford, 8½d.; Bournemouth, 8d.; Brighton, 9d.; Portsmouth, 8½d.; Barnstaple, 5½d. For plasterers and joiners:—London district, 10d.; Carlisle, 8d.; Bradford, 8½d.; Liverpool, 9½d.; Manchester, 9½d.; Bristol, 8½d.; Hereford, 7d.; Potteries, 8½d.; Shrewsbury, 7½d.; Colchester, 8d.; Oxford, 8½d.; Brighton, 8d.; Barnstaple, 5d. For plasterers:—London district, 10d.; Carlisle, 8d.; Bradford, 9½d.; Liverpool, 9½d.; Manchester, 9½d.; Bristol, 9d.; Hereford, 7½d.; Potteries, 8½d.; Shrewsbury, 8½d.; Bournemouth, 7½d.; Brighton, 8½d.; Portsmouth, 8½d.; Manchester, 8½d.; Bristol, 8d.; Hereford, 6d.; Potteries, 7½d.; Shrewsbury, 6½d.; Colchester, 7d.; Norwich, 6d.; Oxford, 6½d.; Bournemouth, 5½d.; Brighton, 7d.; Cowes, 6½d.; Portsmouth, 6½d.; Barnstaple, 5½d. For labourers:—London district, 7d.; Carlisle, 5d.-5½d.; Bradford, 6d.; Liverpool, 5d.-6d.; Manchester, 5½d.-7d.; Bristol, 5½d.; Hereford, 4d.; Potteries, 5½d.-6½d.; Shrewsbury, 5½d.-5½d.; Colchester, 4d.-4½d.; Norwich, 5d.; Oxford, 5½d.; Bournemouth, 5d.-5½d.; Brighton, 5d.-5½d.; Cowes, 4½d.-4½d.; Portsmouth, 6d.; Barnstaple, 3½d.-4½d. Hours of labour:—London district.—For bricklayers, masons, carpenters and joiners, plasterers, painters, and labourers, 50 hours; for plumbers, 47. Carlisle.—For bricklayers, masons, carpenters and joiners, 50; labourers, 50-54. Bradford.—For masons, carpenters and joiners, plasterers, and painters, 49½; painters, 52; plumbers, 49½. Liverpool.—For all operatives, 49½. Manchester.—For bricklayers, 54½; for masons, carpenters and joiners, and plumbers, 49½; for plasterers and painters, 52; labourers, 49½ to 54½. Bristol.—For all operatives, 54. Hereford.—For all operatives, 50½. Potteries.—For carpenters and joiners, 50½; for all others, 54½. Shrewsbury.—For all operatives, 51½. Colchester.—For all operatives, 50½. Norwich.—For all operatives, 50. Oxford.—For masons, 54; for all others, 53½. Bournemouth.—For masons, 50½; others, 55½. Brighton.—For bricklayers, carpenters and joiners, plumbers, and labourers, 50½; for plasterers, 50; for masons, 55½. Cowes.—For all operatives, 50½. Portsmouth.—For painters, 55; for all others, 55½. Barnstaple.—For all operatives, 50.

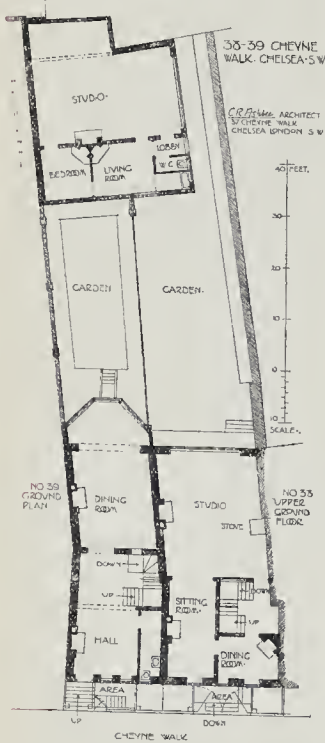
Illustrations.

HOUSES, 38 AND 39, CHEYNE-WALK, CHELSEA.

THE main lines of the elevation of these houses were fixed by the adjoining "Magpie and Stump House," No. 37, Cheyne-walk, and the elevation is designed with reference to it.

No. 38 is a combined studio and residence, and has also a studio in the rear.

No. 39 is a dwelling-house only. There are several details of interest in it; the hall has a panelled dado of American whitewood, with



a decorative frieze by Mr. F. C. Varley, showing all objects of interest along Cheyne-walk in 1900, from No. 1 to the World's End. There are also in various rooms some interesting carved wood fireplaces of early 18th century date, together with some panelling from the old houses formerly on this site.

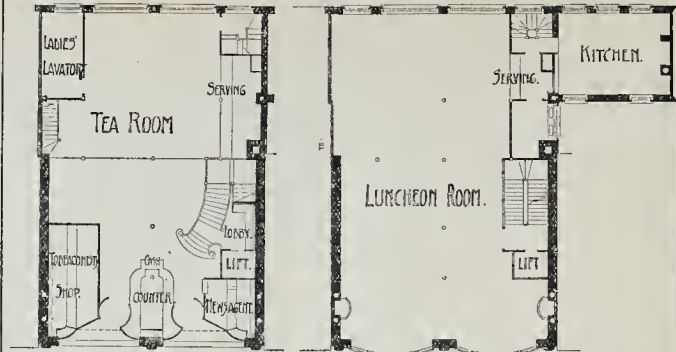
C. R. ASHDEE.

PROPOSED SEASIDE RESIDENCE, HUNSTANTON.

This is a design for a small seaside house at Hunstanton, with the sitting-room apparently intended to face inland, and not towards the sea, probably for consideration of shelter from cold winds. The pantry and scullery is cleverly placed between the dining-room and kitchen, and a servants' stair is ingeniously got in where it might have been thought there was hardly room for it. It would have been better if the servants' water-closet had been a little more separated from the scullery department; it would have been preferable, in fact, with an entrance from the outer air.

The architect is Mr. C. F. Skipper, of London.

The words "elevations 8 ft. scale," &c., of course refer to the size of the original drawing, but could not be erased from the lithograph without spoiling its appearance. As we have often remarked, it is always better to draw out the scale on a drawing, instead of merely noting it in writing.



SCALE OF 1/4" = 1' FEET

BALCONY ON SECOND FLOOR.

New Premises for the Dublin Bread Company. Plans.

DESIGN FOR THE END OF A SCHOOL HALL.

THIS design by Mr. F. Winton Newman was one made in the Royal Academy Schools, and included in the last exhibition of students' work at the Royal Academy.

The conditions were that the hall was to be 50 ft. wide and 70 ft. from floor to ridge, and to be entered through a vestibule with a large window over to light the hall. There was to be a clock turret on the ridge close to the gable end.

S. FRANÇOIS DE SALES, S. TROND, BELGIUM.

THE town of S. Trond contains about 14,000 inhabitants, and is situated about twenty-one kilos. from a junction called Triemont. The town contains some good churches, amongst them being St. Peter's, a small Romanesque church, and also the ruins of the church of the Seminary, formerly the Abbey of St. Trudo, which was destroyed during one of the rebellions. The Church of S. François de Sales is the church of the monastery, and is entirely served by the Franciscan monks. It is situated in a small street leading off the Grande Place. There are seven bays in nave, each 19 ft. between the large buttresses; the chancel diminishes in width by two sides of an octagon, and this inside is utilised for two altars against them. The choir is of three bays terminating at the east by an octagonal end. There is a very large and lofty altar at this end. The church is under one span, and pilasters with deep sub-bases go up to a considerable height, whence the vaulting springs. The western façade is built of stone, with red bricks between the pilasters. The church was built in the seventeenth-eighteenth century. By the side of the church is the monastery. There is also a Town Hall in the Grande Place with a sixteenth-century tower, which is very picturesque; it contains many small bells. This place is quite out of the way of the general run of travellers, but is well worth a visit.

T. MARTIN BROOKS.

NEW PREMISES FOR THE DUBLIN BREAD COMPANY.

THIS building has recently been erected in Sackville-street, Dublin. It was found necessary to build the front in the form of two distinct houses, in order to preserve the lines of separate takings, and an attempt has been made to reconcile the consequently dual effect with the uniform purpose for which the building was to be used.

It was also a motive in the design that it should be suitable in character to its purpose, and this principle dictated the emphasising of the first, or luncheon-room, floor as the principal one by the carrying out of large bow windows, over which a large balcony has been provided, accessible from the smoking-room.

The lower portion of the front, the bay windows, and all dressings throughout are of Portland stone, and the rest of the facing of Thompson & Co.'s pressed bricks.

The general contractor was Mr. Jas. Beckett, Messrs. McCulloch & Navin are responsible for the painting and decoration; Messrs. Henry Hope & Son, of Birmingham, for metal casements; and Messrs. A. Smith & Stevens, of London, for electric lift.

GEORGE F. BECKETT.

LONDON BUILDING ACT, 1894 :

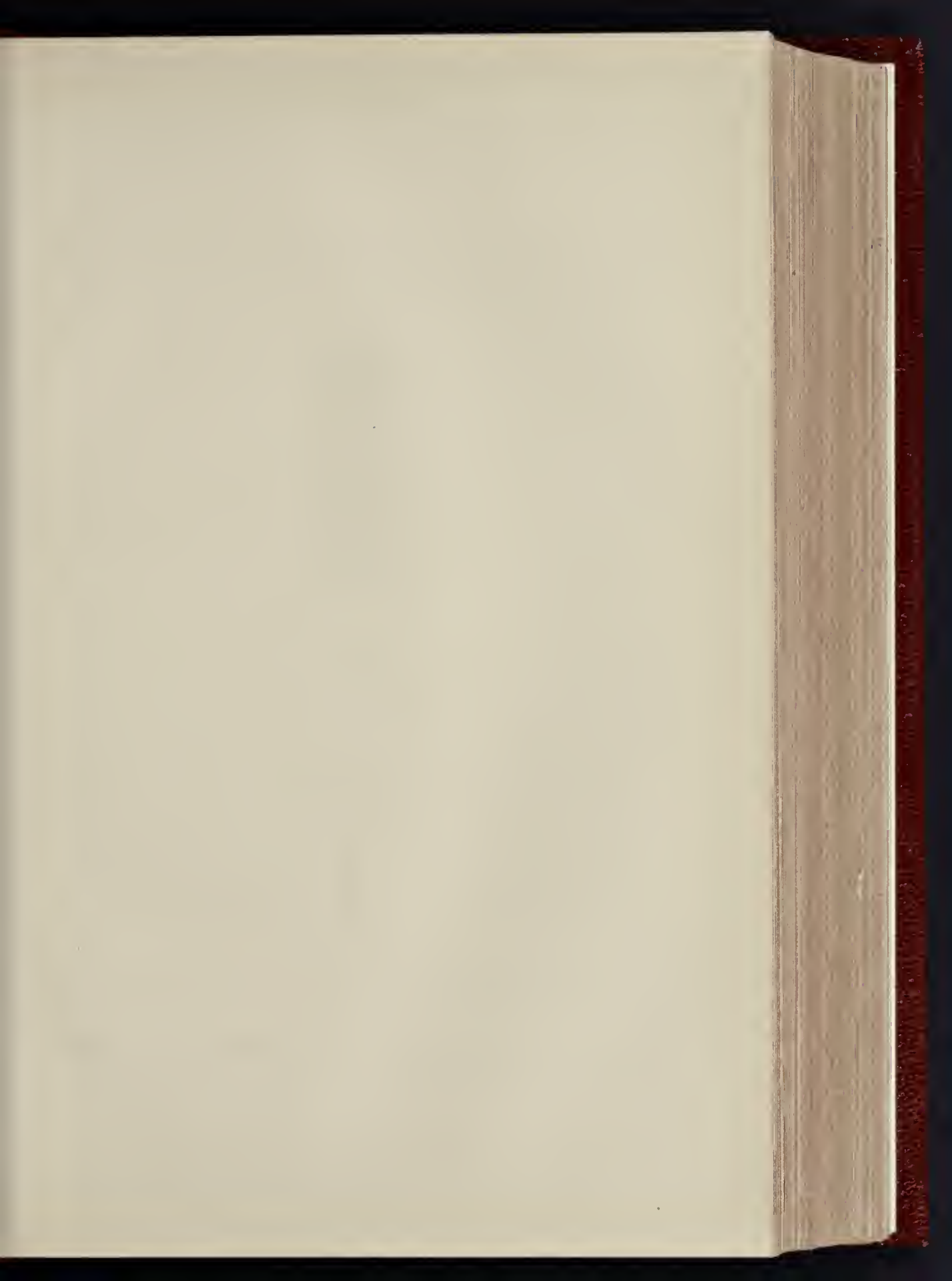
TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Westminster, on Tuesday, to hear an appeal by Messrs. Saltwell, Tryon, & Saltwell, on behalf of Mr. James Fryer, against the certificate of the Superintending Architect of the London County Council, dated October 21, under Sections 22 and 23 of the Act defining the general line of building on the north side of Fawley-road, Hampstead, between West End-lane and Honeybourne-road.

The members of the Tribunal sitting were Messrs. Arthur Cates (chairman), A. A. Hudson, and J. A. Penfold.

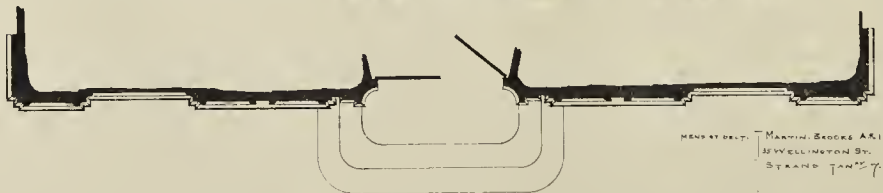
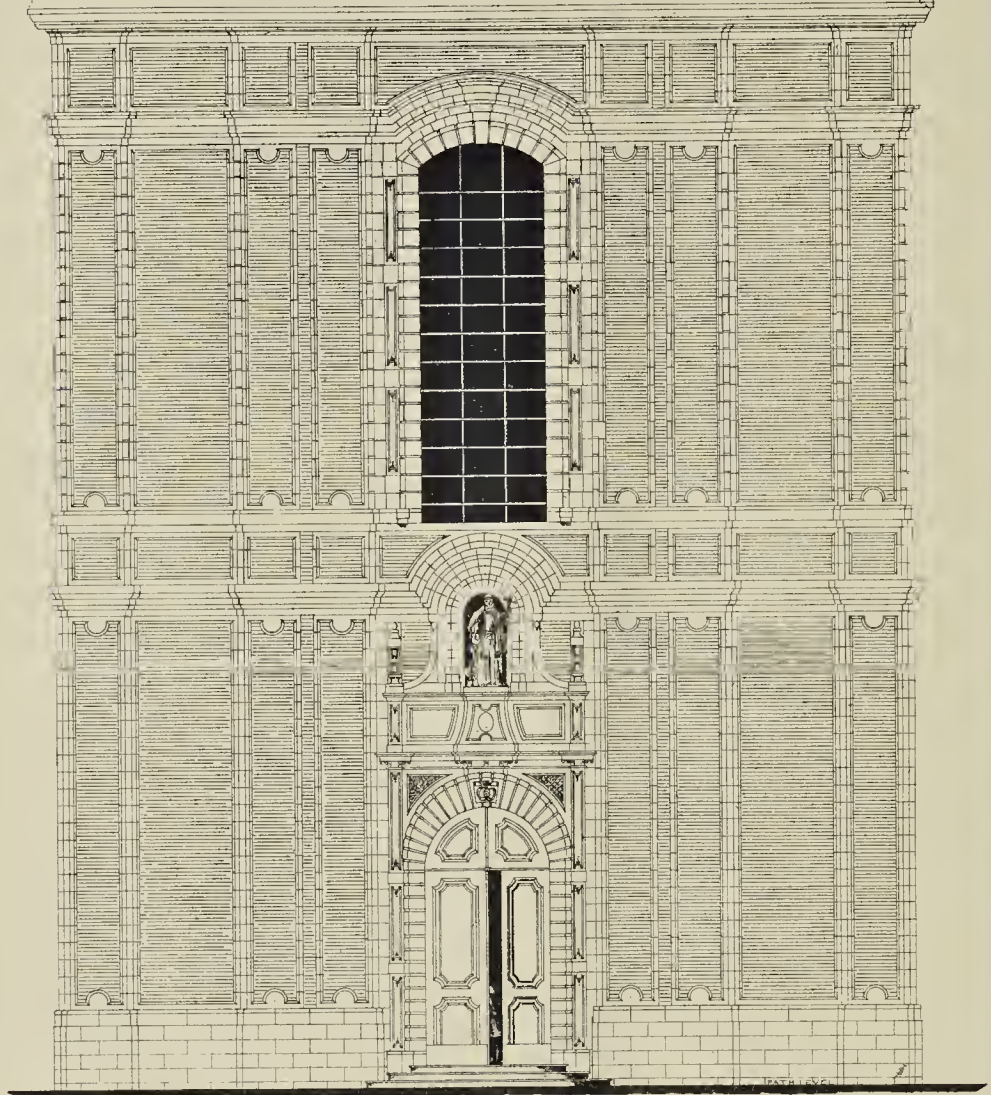
Mr. G. N. Freeman, Q.C., and Mr. T. Willis Chitty appeared for the appellants, and Mr. George Wallace, barrister, for the London County Council.

The case for the appellant, as outlined by Mr. Freeman, was to the effect that appellant was under a contract to purchase the freehold of a plot of land bounded on the west by West End-lane and on the south by Fawley-road. The appellant had erected a row of shops abutting on West End-lane, of which the building in question formed part. On April 8 he prepared plans for a building at the corner of West End-lane and Fawley-road, but abandoned the work after erecting a wall. On May 11 appellant gave notice to the District Surveyor of his intention to resume the erection of this building at the corner, but on July 30 the Superintending Architect called appellant's attention to Section 22 of the London Building Act, 1894, and on August 7 he received notice from the solicitors of the London County Council requiring him to desist from building further. Since that date the appellant had not continued the erection of the building or made any alteration in it except that he had demolished a very small portion. The appellant, who then proceeded with the erection of other shops in West End-lane, received notice of an application to the Superintending Architect to define the line of building, and the appellant, by his solicitor, was heard before the Superintending Architect, but the latter refused to regard the reasons submitted to adjourn his decision and gave his certificate defining the general line of buildings. The grounds of the appeal were these—First, that there was only one row of houses in Fawley-road between Honeybourne-road and West End-lane, and that in order that the general building line of such row of houses should govern the buildings, such buildings would have to be actually situated in such row; secondly, that the contemplated building was not actually situated in that row, but, on the contrary, in a row abutting on West End-lane; thirdly, that consequently the general building line of the row in Fawley-road ought not to govern the building



SCALE: 1/4" = 1'-0" FACE AND

DORMER IN ROOF

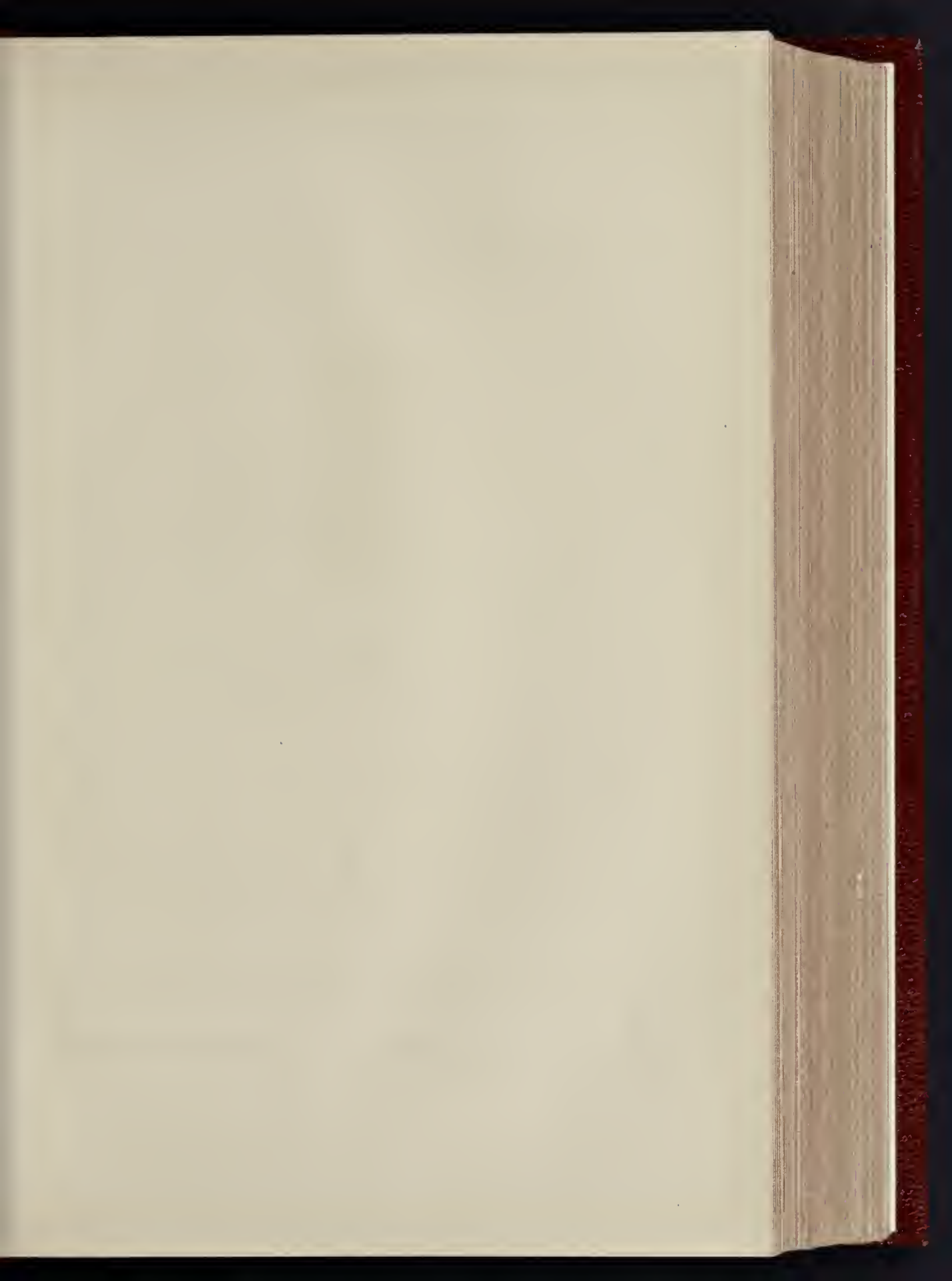


DESIGNED BY: MARVIN BROOKS, A.R.C.S.,
15 WELLINGTON ST.,
ST. PAUL, N.Y. 1901

PLAN

CHURCH: S. FRANCOIS: DE: SALES: S. TROND: BELGIUM

SCALE OF FEET



DESIGN FOR THE
END OF A SCHOOL HALL.

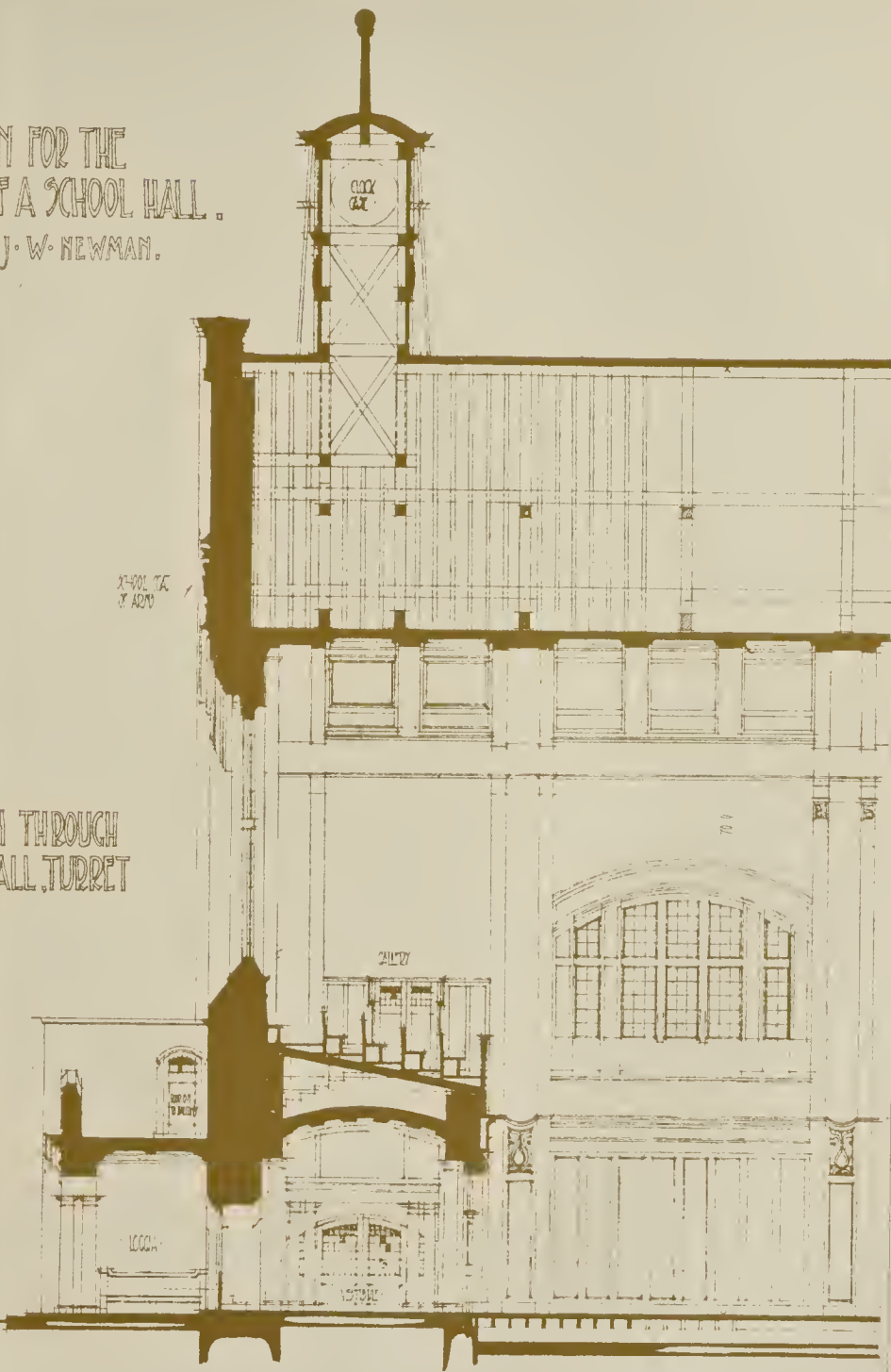


SCALE
OF FEET

FRONT
ELEVATION.

DESIGN FOR THE
END OF A SCHOOL HALL.
BY MR. J. W. NEWMAN.

SECTION THROUGH
END WALL, TURRET
ETC.



27-FOOT DEPTH
OF ARCH

70 0

24 0 0

10 0 0

ALL
FEET

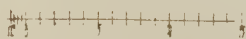




PHOTO-LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

NEW PREMISES FOR THE DUBLIN BREAD COMPANY, DUBLIN—MR. G. F. BECKETT, ARCHITECT

in question; fourthly, that the Superintending Architect must have issued his certificate on the erroneous assumption that the corner houses are in law situated in two streets, that the houses have not a general building line in both streets, he not having had any plans of the proposed building before him; fifthly, that, having regard to the arrangement with the owner of the land on the south side of Fawley-road and the building already erected on the south-west corner of West End-lane and Fawley-road, it was desirable for the purpose of uniformity that the shop appellant desired to erect should be erected, and so maintain the usual building plan as regards the neighbouring streets out of West End-lane. Mr. Freeman contended that the corner building referred to was situated in West End-lane; that as it was part of a continuous row of houses for commercial purposes, it was entirely different in character to Fawley-road, which was residential property. He also contended that the Superintending Architect had before him insufficient data upon which to make his certificate. He cited the case of *Barlow v. the Kensington Vestry* in support of his case.

Evidence having been given by Mr. C. W. Stevens, architect, and Mr. John Tryon, Mr. Wallace, for the respondent, contended that, by Section 20 of the Act, the Superintending Architect had the sole power to fix the building line of any street, and the premises of the appellant were really in the Fawley-road. He relied upon the decision in *Wendon v. L.C.C.*, where it was held that the mere fact of a wall being erected did not give the appellant the right to carry on the building at any time. It was the duty of the Superintending Architect to get the general line, and the appellant had been subjected to no hardships. Moreover, it would be very inconvenient to have two lines of frontage within a short distance of each other. The Chairman stated that the Tribunal would consider their decision and announce it at a future date.

BOOKS RECEIVED.

REPORT OF THE TWENTY-SIXTH ANNUAL POOR-LAW CONFERENCE. (P. S. King & Son.)
FIRE-TESTS WITH FIRE-RESISTING CURTAINS AND FIRE-TESTS WITH FLOORS. (Nos. 51 and 56 of British Fire-Prevention Committee's Publications.)
THE YEAR'S ART: 1901. (Virtue & Co.)
PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Edited by Thomas Cole, A.M. Inst. C.E. (E. & F. N. Spon.)

Correspondence.

To the Editor of THE BUILDER.

SAXON CHURCHES.

SIR,—The volume of the *Anastatic Drawing Society* for 1878, edited by Mr. Llewellyn Jewitt, F.S.A., contains a sketch by the Rev. W. F. Francis, of the Priory Barn, Isleham, Suffolk.

The description accompanying the sketch says:—“The ancient building, now called the Priory Barn, was once a church. It consists of a nave, with chancel in the form of an apse. The walls are of Roman brick built herring-bone fashion with clunch and flints. All the windows are very early Norman and extremely narrow. There is a large Norman doorway leading into the nave and a partly squar-headed one into the chancel. Perhaps the most remarkable features are inside the edifice, these consist of two stilted or horseshoe arches, the larger one separating the nave from the chancel. It is built of Barnack stone, and very massive. The building is now a repository for straw and waggons and every conceivable kind of agricultural implement.”

The sketch does not tally with the description; the nave only shows the Roman bricks, the chancel and its apse shows stone, and there are two courses of stone under the eaves of the nave, as though put there for repair. South door to nave very tall and plain semicircular arched opening. South door to chancel has a shouldered lintel, or (as sometimes called) “Carnarvon arch,” or a spring or water-table runs from the doorway under the sill of the one south window. The apse appears to be a semicircular (on plan), and has buttresses in three stages. There is a plinth to the apse, about half-way between the water-table of the chancel and the ground.

The drawing gives one the idea of a Saxon nave, a Norman chancel with early English doorway asserted, and an early English apse; but perhaps the buttresses are a later addition. Will you allow me to ask for information from any architect near Isleham?
J. M. GETHING.

CHURCHYARDS AND THEIR ACCESSORIES.

SIR,—I read Mr. Crawford Smith's paper in your issue of December 20 with much interest; but while I appreciate every effort that is made to improve monumental work, I cannot refrain from

writing a few lines in defence of the much-abused monumental mason.

In the first place has Mr. Smith (or Mr. Gething in his letter in your issue for the 12th inst.) hit upon the right man for such severe criticism? As a monumental mason I reply, “No.” I am willing to admit that there are good and bad monumental masons, but the majority of those now trading as such, or, as they more frequently style themselves, “monumental sculptors,” are not undertakers. Who has made these undertakers and marble merchants? I reply, our stone and their legitimate business of selling raw material to the skilled mason to the importing of ready-made monuments from Italy. I am far from saying that the merchants were the first offenders; others entered the field who knew nothing of material or workmanship and were also supplied from Italy, with the result that the market is full of cheap monuments utterly devoid of taste or beauty. Our cemeteries are full of such outrages, and our churchyards are now being attacked. Fortunately the vicars of many places are alive to the danger and prohibit the erection of these ugly things. A vicar recently remarked to me, “They shall not bring them here; I will not have them. If the public has no taste I have, and I will do my very best to educate the public.” Herein lies the gist of the whole matter—educate the public. This is a large order indeed. I have been endeavouring to accomplish this in matters monumental for many years. The fact of the matter is the public are ready to buy from any one who will sell the largest, the most flowery monstrosity (and it must be marble) that can be found, providing only it is cheap.

Now for the remedy. Mr. Gething says “if you cannot design what is beautiful, steal it, but don't produce bad work.” Alas, many of the monumental sculptors already referred to need no such advice, for this very “stealing” is one of the greatest curses under which the skilled monumental mason struggles. I have designed memorials which most architects and the educated public do appreciate, the undertaker “steals,” attempts to reproduce, and the result is most deplorable. Copy they cannot; I would that they could. Photographs of my original work and of bad copies of the same, taken by travelling photographers and supplied to the undertaker, have been brought to my office with a request that I should furnish an estimate. I produce my original design and estimate; the price is too high. The photograph is sent to Italy and another abortion is produced.

Many will doubtless be glad to attend any meeting of the Institute of British Architects to hear and discuss this matter and to devise some scheme which will give the legitimate monumental mason the place he deserves and protect his designs from this pilfering and mutilation, and thereby encourage those who wish to labour for art's sake and the beautifying of our burial places.

A MONUMENTAL DESIGNER AND MASON.

‘COLLUSION AMONG CONTRACTORS.’

SIR,—I have read the letter signed by “A Sufferer” in your issue of last week, and as a London builder of some experience I have no doubt that if the writer will publish his identity and come out in the open, there are many others besides myself who will be pleased to take up this discussion. If “Sufferer” cannot give his name, the matter is not worth the trouble of disproving.

F. G. MINTER.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

3.—GENERAL NOTES ON SANITARY FITTINGS.

THE term “sanitary fittings” is generally taken to include all fittings intended for the reception of the foul liquids and water-carried solids which are produced in and about our buildings, exclusive of trade processes. The term, therefore, excludes such fittings as dyers' and sizers' vats and other tanks employed in factories and workshops, and is confined to sinks, wash-tubs, baths, lavatories, water-closets, slop-hoppers and sinks, and urinals. Of each class of fitting there are many varieties, which are adapted for different purposes and for different kinds of buildings. The principal varieties will be considered in subsequent chapters. At present it is our purpose to state a few general rules which ought to be applied in the selection of sanitary fittings of all kinds. These rules may be summed up in five words—efficiency, cleanliness, durability, simplicity, and (within limits) economy. That a sanitary fitting should adequately

serve the purpose for which it is intended is obvious, but thousands of fittings are still fixed every year which cannot by any stretch of imagination be regarded as efficient. There are lavatories with waste-holes so small that they cannot be rapidly emptied, with overflows badly arranged, with drains from soap-dishes made only to be choked, and with the “clean” water arranged to enter through the more or less foul waste or overflow openings. Baths exhibit almost the same defects.

There are “water-closets” without water, or so insufficiently flushed that the thorough removal of the solids is impossible. Others are so constructed that they hold very little water, or none at all, for the reception and deodorisation of deposits. And there are unflushed urinals and slop-hoppers. All these perhaps serve in a manner the purpose for which they were designed, but they do not serve it efficiently, and every fitting of this sort is therefore imperfect.

One of the principal marks of efficiency in a sanitary fitting is that it shall form an effective barrier against the entrance of foul air from the drains and waste-pipes. In some fittings—as, for example, lavatories and sinks—this barrier is a plumber's trap which does not form an integral part of the fitting itself, but in many water-closets, slop-hoppers, and baths the trap is part of the fitting, and its efficiency must be carefully considered. Water-closets are often defective in this respect; the water-seal of the trap is, perhaps, too small, and is therefore in danger of being removed by siphonage or evaporation. Or the trap may have no provision for ventilation, a defect which will render it unsuitable for fixing in series.

Cleanliness is a question both of design and material. One of the best materials for sanitary fittings is undoubtedly some kind of porcelain, either solid or applied in the form of an enamel. It has its disadvantages of course,—if applied as an enamel it may chip off and expose the rougher porous foundation to the action of the foul water, and if solid it may (as in a lavatory basin) be cracked by a blow or by sudden contact with hot water,—but it has the great advantage of cleanliness. It is impervious, and consequently can always be kept clean, if the fitting is so designed that every part is accessible. Foul matters will, however, adhere to porcelain as to every other substance, and these must be periodically removed if the fitting is to remain satisfactory. Careful design is therefore necessary. All internal angles ought to be well rounded, and as far as possible every part of the fitting ought to be accessible to the brush or cloth. The overflows of sinks and lavatories have, until recently, been very defective in this respect; no provision whatever was made for cleansing them, and the consequence was that they often became extremely dirty, and were sometimes quite choked with soapy and greasy matter.

Many water-closets still in use are of such a form that they cannot possibly be kept clean by ordinary flushing. The containers of pan-closets are almost invariably coated with filth, and some closets of more recent design are very little better. The traps of wash-out closets are generally more or less foul, and many wash-down closets have such a small area of standing water that the basin is soiled every time the closet is used.

The nature of the flush is often accountable for the uncleanness of water-closets, urinals, and slop-sinks. The water may be insufficient in quantity, or may be delivered in such a small volume, and at such a low rate of velocity, as to be almost useless for cleansing the basins and traps. In many old closets the water is delivered through a fan-spreader, which cannot possibly distribute it over the whole surface of the basin.

The enclosure of sanitary fittings with wooden casings is fortunately now almost a thing of the past, but it is well to repeat that such casings are, as a rule, most objectionable. It is true that in some recent hospitals cupboards have been formed under the sinks for the storage of hed-pans, but in such cases the windows have been continued down to the floor, so that the cupboards are properly lighted, and air-grates have been fixed in the external walls or windows for ventilation. The panels of the doors of such cupboards ought to be fitted with sheets of clear glass, so that any uncleanness can be easily detected. Where these precautions are taken the objections to enclosed fittings are considerably

reduced, but it is certainly best to leave the fittings exposed wherever possible, as in nearly every case enclosures are difficult to keep clean and sweet. Certainly the ordinary casings of baths and water-closets are most objectionable, as they conceal the plumber's work, and add considerably to the difficulty of inspection and the cost of repairs. When removing the casing of a water-closet it will often be found that the floor within the casing has been covered with sawdust, and that this is sodden with water and filth; the plumber had evidently thought it a wise precaution to provide some material to absorb the leakage from the defective joints which he had made, and so prevent or delay the detection of his carelessness or incapacity. It is a golden rule to insist on all sanitary fittings, and the plumber's work connected with them, being exposed to view, so that everything can be kept thoroughly clean; exposure also ensures sounder and neater work, renders the detection of leaks more easy, and reduces the cost and dirt of repairs.

As woodwork in connexion with sanitary fittings is not conducive to cleanliness, the tendency of modern sanitation is to reduce the woodwork to the least possible quantity; hence we have cast-iron roll-top baths without enclosures, iron brackets for supporting lavatories, &c., steel seats for water-closets, porcelain-enamelled drainers for sinks, and other contrivances.

It is a mistake to cover sanitary fittings with elaborate ornamentation, either raised or printed or painted. Certainly the parts which are in contact with foul water—such as the internal surfaces of sinks, water-closets, lavatories, and baths—ought to have the surfaces perfectly white or cream-coloured, so that the slightest deposit of foul matter can be easily seen.

Durability is the third quality which sanitary fittings ought to possess. Baths are now generally of cast-iron, and experience has proved that it is a satisfactory material for the purpose. Some of the methods of finishing the surface leave, however, something to be desired. Copper and zinc are also used for baths, the former being the more durable. Salt-glazed or enamelled freelay is largely used for other sanitary fittings, and is an excellent material if it is thick enough to resist ordinary blows, and if the enamel is thoroughly adherent to the freelay body; in cheap fittings the enamel is often defective in this respect, and will chip or flake with the slightest rough usage. Indeed, the enamel is often cracked during the process of burning, and all enamelled freelay fittings ought to be carefully examined for such defects.

The best fittings of moderate size are made of some kind of pottery or whiteware suitably glazed. As the material is more or less brittle, it ought not to be too thin. Many lavatory and water-closet basins are defective in this respect, and are therefore easily cracked. For the tops of lavatories polished marble is a satisfactory and durable material.

Some materials are sufficiently durable, but are unsatisfactory in other respects. Stone, for example, has been much used for sinks, but, on account of its perviousness, it is difficult to keep clean. Even slate, dense though it is, is far from perfect; it has been largely specified for urinals, but the valid objections to the plain polished surface have led to the adoption of various kinds of enamel, none of which, however, is permanently satisfactory—at any rate, for urinals. There is less objection to its use for the tops of lavatories, but even for these fittings some kind of porcelain or enamelled freelay is better.

Of two sanitary fittings—other things being equal—the simpler ought to be preferred. Elaborate mechanism is out of place in such fittings. The tendency of recent sanitation towards simplicity is nowhere so marked as in the case of water-closets. The pan-closet is universally condemned, and the valve-closet, although its life has been preserved beyond its natural limit by the exertions of one clever writer, is hastening towards oblivion. Simpler fittings have taken their place. The same process can be observed at work in the case of the overflow and waste arrangements of baths and lavatories since the first attempts were made to do away with the old plug and chain and the uncleanable overflow. Complicated arrangements are likely to get out of order and increase the difficulty of keeping the apparatus clean, besides being costly to repair.

Of the last point to be considered—namely, economy—little need be said. In many cases it is one of the most important considerations, but in general fittings of good quality can now be obtained, and it is the architect's duty to see that his client obtains the best fitting possible for his money. Beyond a certain limit, however, economy cannot be safely practised, and the owner of the building ought either to be content to do without the fitting altogether, or to pay for one which is likely to prove reasonably satisfactory.

GENERAL BUILDING NEWS.

NEW CHURCH, BIRMINGHAM.—The foundation-stone of the new parish Church of St. Peter was laid recently by the Right Hon. Viscount Cobham. The site is in George-street West, near its junction with Spring Hill. Plans prepared by Mr. Frank Barlow Osborn provide for a building in the Early Perpendicular style, of red brick inside and out, with Hollington stone arcades, windows, and dressings, and a tiled roof. The west end faces George-street West, with a baptistry projecting from the end of the nave, from which it is approached by an archway. On each side of the baptistry are porches leading into the nave, and at the west end of the south aisle is the tower, which will be 81 ft. high to the top of the parapet. The length of the nave is 95 ft. 6 in., the chancel 38 ft. 6 in., and with the baptistry the total internal length of the church is 145 ft. The width of the nave and aisles will be 54 ft. In addition, there are two shallow transepts, increasing the width to 68 ft. In this portion of the church, each having separate entrance, is a chancel aisle on the south side; and choir and clergy vestries, with organ chamber over, on the north side. The seating accommodation will be for over 750 persons on the ground floor level. The church will be lighted by traceried windows, including large ones at the east and west ends. The roof will be open, showing the timbers. Oak will form the seating on the floor. The font from Old St. Peter's will be utilised and placed in the baptistry. The cost of the church, including the heating apparatus, but exclusive of the organ, will be 12,900*l.*, and it is expected it will be completed within two years. The contractors are Messrs. W. Sapcote & Sons.

WESLEYAN CHURCH, PENARTH.—Trinity Wesleyan Chapel, Stanwell-road, Penarth, has just been opened. The new building replaces an iron church. The style of the church is Decorated Gothic, the facings being of Newbridge stone with Bath stone dressings. The main dimensions of the building are 101 ft. in length, 78 ft. in width, 34 ft. to the top of the nave roof, and the spire when completed will be 107 ft. high. The principal entrance is at the west end. The porch has a mosaic floor, paneled wood ceiling, and painted glass windows. The interior arrangements of the building include a nave, with side aisles, north and south transepts, and chancel, with the organ chamber adjacent, minister's vestry, and a vestry for the choir, from which access is also obtained to the schools adjoining. The roof is of barrel vault construction. All the windows have traceried heads, and throughout are fitted with stained glass. The pulpit is of oak, and is placed in the nave on the south side of the chancel. The choir stalls are of oak, having traceried panels and poppy head terminations. The space behind the communion rail is floored with marble and mosaic, the other floors throughout being of teak and pine blocks. The means of lighting adopted is the electric light generated on the site; gas also is laid on in case of emergency. The seating is of oak, the floor of the church being formed on a gentle slope. The accommodation of the building is for about 650. The architects are Messrs. S. W. Richards and Henry Budgen, and the contractors Messrs. Jones Bros., of Cardiff. The whole of the coloured windows have been designed and executed by Mr. H. J. Salisbury, of London and St. Albans.

CHURCH, WORMIT, FORFARSHIRE.—A United Free Church has been erected at Wormit to accommodate 400. By the rearrangement of floor space and the insertion of a gallery the building will seat 150 more. It is built of stone, and the entrance is by a flight of steps and a stone porch. The windows are filled with cathedral glass, the lighting is by means of ten brass lamps, and the heating is by hot water pipes. The estimated cost of the building is 3,500*l.* The architects are Messrs. James MacLaren & Sons, and the contractors are as follows:—Builder, Robert Tait, Newport; joiner, W. Buist, Woodhaven; internal brickwork of walls, Luke Linder, Dundee; plasterer, Alexander M'Ritchie, slater, James Laburn & Sons; glazier, Lindsay & Scott; plumber and heating apparatus, James S. Jack, Newport; painter, D. Mackellar; lamps and tiling for porch, Kirk & Coutts, Dundee; ironwork, William Young Newport.

GOODALL-STREET CHAPEL, WALSALL.—This chapel was reopened recently after undergoing alteration and restoration. Messrs. Hickton & Farmer were the architects, and Messrs. Brockhast & Wood the contractors. A memorial window, the

work of Mr. Swaine Bourne, of Birmingham, has been placed in the chapel.

RESTORATION OF MACCLESFIELD PARISH CHURCH.—The work of restoration of this church is practically complete, and the opening will take place on Wednesday, April 23. The work was carried out from plans by the late Sir Arthur Blomfield, A.R.A., and has cost over 20,000*l.*

CATHOLIC CHURCH, OMAGH LUNATIC ASYLUM, CAPPAUGH, CO. WATERFORD.—A church has been erected for the Catholic inmates of Omagh Asylum. The building is 80 ft. long and 30 ft. wide, and will seat 500 persons. Mr. C. B. O'Connell, of Dublin, is the architect. The contractor was Mr. J. Colbourn.

CONGREGATIONAL CHURCH, SUTTON.—The Congregational church at Sutton has recently undergone redecoration, &c., and additional buildings have been added. The work has been carried out by Mr. Shoppard, builder, of Sutton, Tom plans by, and under the supervision of, Mr. Wm. Theobalds, architect, London.

BOARD SCHOOLS, WREXHAM.—The Victoria Board Schools at Wrexham were opened on the 1st inst. The architect was Mr. W. Moss, of Wrexham, his plans having been selected in competition. Mr. W. E. Samuel, of Wrexham, was the contractor; and Mr. W. L. Walker, the clerk of works. The schools accommodate 1,000 children and have cost nearly 15,000*l.*

BOARD SCHOOL, BINGLEY, YORKSHIRE.—A new infant school has been erected by the Bingley School Board in Belgrave-road, Bingley. The building, which is of stone, will accommodate 250 children, and is divided into an assembly-hall with classrooms, arranged in pairs. The main room is 47 ft. 6 in. by 60 ft., and two of the classrooms 47 ft. 6 in. by 22 ft. 6 in., and the third 21 ft. 3 in. by 20 ft., and the remaining one 20 ft. by 23 ft. The heating is by hot-water on the low pressure system, and there is also a fireplace in each room. The ventilation is effected by Tobin's inlet tubes and ridge extractors. The woodwork is of pitch pine. The playground is provided with a covered shed. The cost of the school, exclusive of land, has been 1,600*l.* The work has been carried out by the following contractors, under the superintendence of Mr. W. R. Nunn, the architect:—Masonry, Mr. R. Wood; joinery, Mr. J. Greenwood, Crosshills; slating, Mr. W. Thornton; plumbing, Mr. M. Brown; plastering, Messrs. H. Spurr & Son; painting, Mr. J. W. Anderson; heating apparatus, Mr. T. Meats, Bradford.

NEW BOARD SCHOOLS, SOUTHAMPTON.—The Central District Board Schools at Southampton were formally reopened last week. The schools have undergone extensive alterations and additions. The original school for boys and girls was a two-story building accommodating 598 children, and the infants' school was a one-story building accommodating 300, or a total of 898. In order to avoid buying a site for another school, to cope with the increased accommodation required, a daring and somewhat novel proposition was agreed to: the roofs have been raised and the necessary accommodation provided in that way. The boys' and girls' school has had an additional story put on, making it a three-story building, and the infants' school has had an additional two stories put on, and the two buildings have been coupled together, making one high building, the infants being on the ground floor, the girls on the first floor, and the boys on the top floor. The roofs were lifted bodily and the work carried up to them. The area of the boys' and girls' school roof was 3,900 ft.², and the infants' school, 2,500 ft.². The increased accommodation given is for 1,550 children, or a total, now the building is complete, of 1,657. The total cost of the additions, including furniture and contingencies, is 11,350*l.* The work was carried out without the slightest mishap to the roofs. The architect was Mr. John H. Billard (Messrs. Lemon and Billard), and the clerk of works, Mr. S. Jurd. The builders were Messrs. H. Stevens & Co. of Southampton.

SCHOOLS, HASTINGS.—The new schools at St. Helen's, opposite the Hastings Borough Cemetery, have just been opened. Accommodation is provided for mixed and infants' departments. The building comprises two floors, with covered playgrounds, and a heating chamber under a part of the ground floor. The site is about an acre in extent. At present the ground floor accommodates 100 infants. On the first floor is the mixed school to hold 260 children. There are teachers' rooms in both the infants' and mixed schools. These rooms are in each case on a level with a dais, and by throwing back the folding doors this can be converted into a platform, to be used in connexion with the central halls when they are required for public meetings. The building is constructed of red brick, with moulded red brick facings on the front and sides, the back being perfectly plain, and the roof is covered with red tiles. The buildings were erected by Mr. T. T. Denny, of Walmer, Kent, and Mr. Arthur Wells was the architect. The heating arrangement and boiler were supplied by Messrs. Upfield & Sons, of Hastings. The amount of the contract for the erection of the buildings was 9,755*l.*

BOARD SCHOOLS, MORLEY.—The new schools which have been built by the Morley School Board in Victoria-road were opened recently. The build-

ing, which, with the site, has cost about 9,500l., provides accommodation for 500 children in the mixed department and 240 in the infants' department. The schools, which are in the classical style, have been erected on the central hall principle, and are in two portions, the classrooms (eight in number) being grouped round the central hall, the entrance to which is approached by corridors 9 ft. wide. Local stone has been employed, and the woodwork throughout is in varnished pitch pine. The architects were Messrs. T. A. Buttery and S. B. Birds, of Morley.

THE PLYMOUTH ATHENÆUM.—The new buildings which have been added to the Plymouth Institution have just been opened. They consist of a reading-room, library, and other rooms. The new buildings have been designed by Mr. A. S. Parker, architect, Plymouth, whose designs were selected in competition. The front is treated in the Grecian style of architecture, in continuation of the style of the original building, which was designed by Mr. Fulston, of Plymouth, in the early part of the past century. The entrance is adorned with fluted Doric columns on either side of a recessed portico. The entrance doors are wide, with bevelled-edge square plate panels. They lead into an entrance hall, 18 ft. square, the staircase hall and alcoves for the display of antiquities branching therefrom. The hall floor is on a level with the museum gallery, and there is a circular junction with the old buildings at the north-west corner. The reading-room is 30 ft. by 24 ft., and 18 ft. 6 in. high, fitted with electric lamps. The library, 32 ft. 6 in. long, by 24 ft. 6 in. wide, and 21 ft. high, has a stained open roof. A council-room leads from the hall and library. Opposite the entrances the main staircase leads to the ground floor of the museum, this forming the main connexion between the new and the original buildings. Ladies' and gentlemen's cloak rooms and a photographic dark-room complete the accommodation of the extension. The building and fittings have been carried out by Mr. G. P. Turpin, contractor, of Plymouth, and the heating apparatus, both for the old and the new buildings, has been fitted by Mr. W. T. Hocking, while the electric-lighting has been carried out by Mr. W. E. Heath.—*Western Mercury.*

IMPROVEMENT OF THE LEEDS TOWN HALL CRYPT.—An improvement in the access to the crypt of the Leeds Town Hall will be completed, from plans of the City Engineer, for the Lord Mayor's ball on the 24th inst. Instead of the narrow steps by which guests formerly reached the supper-room from the George-street corridor, a proper staircase leading from the ante-room forming the east entrance to the Victoria Hall is being provided. It will have a central main flight, and will divide half-way down into a right and left staircase. At the foot of these staircases there will be a crush-room, with large folding doors opening into the crypt. Besides the crypt, it was not only provided with an electric installation, but converted into quite a lofty hall by lowering the floor.—*Yorkshire Post.*

NEW BUILDINGS, EXPERIMENTAL FARM, GARFORTH, YORKSHIRE.—At the Manor Farm, Garforth, where, under the auspices of the County Councils of the West and East Ridings, educational work is being carried on as a department of the Yorkshire College, the new buildings are now almost ready for occupation. These are to be devoted to practical instruction in agriculture and kindred industries. There are two sections. One comprises the dairy, including rooms for separating, churning, making-up, packing, and delivery, and cold storage. The other has on the ground floor a lecture-room, the board and professor's room, male students' sitting-room, &c.; and on the first floor a laboratory, a classroom, a bacteriological-room, a female students' sitting-room, &c. In the basement are the heating apparatus and the boilers. The buildings, which cover an area of about 100 ft. by 30 ft. are lighted by electricity. The new buildings have been erected from designs by Messrs. Smith and Tweedale, architects, Leeds.

NEW HOTEL, STORNOWAY, SCOTLAND.—Estimates have been accepted for the erection of a new hotel in South Beach-street, Stornoway, and the site is now being cleared of existing buildings. The building will contain twenty letting bedrooms, large commercial-room, dining-room, drawing-room, smoke-room, &c.; and there will also be a restaurant on the ground floor. The stones for dressed work of the front elevation will be from Newton Quarry, Elgin; the other building material will be of local rubble, and the rear dressings of Granolith. The sanitary fittings will be by Mr. Leslie Hall, of Glasgow; the grates and tiles by Messrs. Bannochie, of Aberdeen; and the wood fittings by Messrs. Garvie, of Aberdeen. The building will be carried out from designs and under the superintendence of Mr. R. B. Pratt, Elgin, at a cost of 5,500l., by the following contractors:—Masonry, Messrs. Ross & McKenzie, Stornoway; carpentry, Messrs. Ross & McKenzie, Stornoway; plumbing, Messrs. Ross Brothers, Elgin; slating, Messrs. Fraser & Thompson, Elgin; plastering, Mr. S. Macrae, Inverness; painting, Messrs. McKenzie & Son, Stornoway.

PUBLIC HALL, GRANGE-OVER-SANDS.—The new public hall at Grange-over-Sands was opened on the 1st inst. The building has been erected at the rear of the new Council offices and bank premises in Main-street. The materials used were local

limestone and Prudham freestone dressings. Mr. John Hutton, of Kendal, was the architect, and the following were the contractors:—Masonry, Messrs. Jacob Denny; carpentry and joinery, Mr. Wm. Till; slating and plastering, Mr. John Chippendale, jun.; plumbing, Mr. Benjamin Ward; painting and glazing, Mr. J. W. Braithwaite; all of Grange. The heating and ventilating were carried out by Messrs. John King & Co., of Liverpool.

TOWN HALL, KEIGHLEY.—The members and the officials of the Keighley Town Council have entered into possession of the new offices—now called the Town Hall—which have been erected in Bow-street, in the centre of the town. The new structure is 133 ft. in length, with a width of 33 ft., and there are four floors from the ground level, the height to the eaves being 48 ft. The basement is divided into a number of storerooms and a room for the heating apparatus. On the ground floor, entering from the public door in Bow-street, the first room is given up to the Borough Treasurer's department, with a pay counter and pay windows. The clerks are accommodated behind the pay counter in a room 52 ft. by 23 ft. in extent. Next come a private room for the borough treasurer, two rooms for the town clerk, and other rooms for the sanitary officials, the medical officer, and the water superintendent. The mayor's rooms are on the first floor, and comprise a parlour with an oriel window, the room being 28 ft. by 18 ft. in size, a private room overlooking Bow-street, and an ante-room on the other side. The remainder of the floor is taken up with a range of rooms for the surveyor's department and two committee-rooms. The second floor is utilised for the council chamber and supplementary rooms. Occupying a corresponding position to the mayor's rooms are a retiring-room and a robing-room; then comes a dining-room, and at the north end is the new council chamber. This room is 35 ft. by 30 ft. The walls are panelled to a height of 12 ft. The arrangement of the rooms on the third floor is similar to that of the lower floors, but at present—with the exception of the kitchen—these rooms will not be used, though they will be available for extensions. The building is heated throughout with hot-water radiators on the low-pressure system. The lighting is by electricity, which, until the Corporation's works are ready, will be furnished by the Fleece Mills Company. The building, including furnishing and electric lighting, has cost about 10,000l. Mr. John Haggas, architect, is responsible for the external design, and the internal arrangements were planned by Messrs. J. E. Bailey & Son, architects, Scott-street, Keighley. The contractors have been as follows:—Masons' work, Mr. Thomas Moore, Keighley; joiners' work (including furnishing of treasurer's, health, and surveyor's departments), Mr. Ineson Taylor, Lees; slaters' work, Messrs. T. Nelson & Sons, Bradford and Keighley; plasterers' work, Messrs. Bradley, Krischke, & Co., Bradford; plumbers' work, Mr. J. Jackson, Keighley; iron work, Mr. Thomas Moore, Keighley; painters' work, Messrs. Tillotson & Harrison, Keighley; heating, Messrs. Bailey & Chapman, Keighley; electric lighting, Messrs. G. H. Woods & Co., Blackburn; and furnishing of the mayor's and retiring rooms and the council chamber, Messrs. Simpson & Sons, Limited, Halifax.

TOWN HALL, ENNISKILLEN.—The new Town Hall at Enniskillen was opened on Monday by the Countess of Erne. The building is situated on the Diamond, an elevated portion of the island on which the town is principally built, and the cost of its erection amounted to a sum of about 11,000l. The building is Renaissance in style, and the area which it covers is 9,070 square feet. Limestone from the local quarries has been used in the construction of the walls, together with brick, and the exterior is faced with punched stone, from the Carrickeragh quarries, which are situated on the shores of Lough Erne. Duganonn chiselled sandstone has been used in the mouldings, pilasters, columns, and cornices. The main entrance from Townhall-street is flanked by pilasters and columns, supporting an ornamental balcony, which is reached from the corridor on the first floor level, and surmounting the building is a tower containing four angled turrets terminating in a dome with finials, &c. On the basement floor there are caretaker's apartments, and advantage has been taken of an inclination in the site to arrange them principally overground. Provision has been made for cooking for public banquets, and there are also a storeroom and an engine-room containing all the fire-brigade appliances. On the ground floor there are two entrances, the main one being in Townhall-street and a side one in Water-street. The main entrance is flanked by the town clerk's office and the chairman's parlour on one side, and by a reading-room and a book store on the other. From the clerk's office on the left of the entrance there is a flight of stone stairs leading to the strong room in the basement of the tower, and there is communication through the chairman's parlour with the council chamber. A minor hall, 35 ft. by 31 ft., occupies a portion of the structure facing Water-street. It is fitted with a moveable platform, and will be for small meetings or entertainments. Off this hall there is a committee-room, divided by moveable partitions. Over the suite of municipal offices there is the assembly hall, which is reached from the ground floor by a staircase. This room is 29 ft.

high and is entered by four doors running along the corridor. Messrs. Anthony Scott & Sons, of Drogheda, were the architects, their plans having been selected in competition, and placed first by the assessor, Sir Thomas Drew. The general contractor was Mr. James Harvey, Enniskillen. Messrs. Musgrave & Co., Belfast, supplied the heating apparatus. The stone carving was executed by Mr. Hart, of Brookeborough.

WORKHOUSE INFIRMARY, SKIPTON, YORKSHIRE.—A new infirmary, adjoining the Skipton Union Workhouse, was opened on the 12th inst. Mr. Hartley is the architect.

TRINITY HOSPITAL, LEICESTER.—This old building is being demolished to make room for the new hospital. Some part of the building will be retained and incorporated in the new building. Mr. J. Goodacre is the architect.

SANITARY AND ENGINEERING NEWS

DOCK SCHEME, BRISTOL.—As the result of a citizens' poll, Bristol has decided to promote a Bill next Session for powers to construct a new ocean dock at Avonmouth, capable of accommodating the largest vessels afloat, at a cost of just under 2,000,000l. Fully 60,000 papers were issued, and 40,000 collected. Of these 13,000 were unsigned. There were 25,000 votes for the Bill and 9,000 against. Sir Wolfe Barry and Sir Benjamin Baker recommended the proposed dock, which will take five years to construct.

OSSETT SEWAGE. The scheme of extension at the Healey outfall is now approaching its last stage. It was sanctioned by the Local Government Board without any alteration or suggestions. Possession of the land has been got, and the Corporation have instructed Messrs. Malcolm Paterson and Sam Shaw, M.M.Inst.C.E., who are joint engineers, to prepare for letting the contracts. The works consist of three miles of intercepting sewers, new tanks, buildings, machinery, storm-water filter, and land filtration beds, and the engineers' estimate, inclusive of land, is about 10,000l. It is expected that the works will be let before the middle of March.

BURLEY-IN-WHAIRFEDALE WATERWORKS.—The arbitration in respect of the acquisition of Mrs. Crofton's two reservoirs and water rights on Burley Moor, near Ilkley, was concluded a few days ago. The case was peculiar in its complications, and the methods of valuation adopted by the two parties illustrated two totally different principles. The claimant's engineers assumed that their client was in the position of a vendor of water with power to sell in bulk to competing authorities, and assessed the claim, which included manorial rights, at 11,000l. On the other hand, the Council Engineers contended that there was no power to sell or even divert the water, but merely to impound it up to, and no further than, the present capacity of the reservoirs, which are encroachments on a common with rights gained by prescription only, and to turn such water into the stream bed. They therefore assessed the compensation for the reservoirs and water rights on the basis of the rental received and user at the claimant's mill, amounting to about 26l. or 28l. yearly, arriving at a total sum of 800l. or 900l. only. This, they maintained, was the true principle as laid down by the Lands Clauses Acts, namely, the value to the claimant at the time of transfer. They also denied the existence of competition, even if there were power to sell water. The umpire was Mr. T. T. Wainwright, of Liverpool, and the arbitrators Messrs. T. Fenwick and Geo. H. Crowther. The claimant's case was led by Mr. H. Johnson, C.E., and the Council's case by their Engineer, Mr. Malcolm Paterson, C.E.

STAINED GLASS AND DECORATION.

CAIRD MEMORIAL WINDOW, GLASGOW UNIVERSITY.—On the 12th inst., the window which has been erected in the Bute Hall of Glasgow University to the memory of the late Principal Caird, was unveiled. The window was designed by Mr. Dearle and executed by Messrs. Morris & Co.

FOREIGN.

FRANCE.—M. Mercier has completed the statue of Alfred de Musset for the Place du Théâtre Français in Paris, originally undertaken in collaboration with Falguère, but the delivery of the work is subject to the result of legal proceedings between M. Ogris, who commissioned the work, and M. Mercier, who now demands a higher price for the work than that originally agreed upon.—At the Gobelin's a large tapestry is to be taken in hand for the decoration of the Mairie of the XIIIth Arrondissement; it is to represent the apotheosis of Colbert, and is from the designs of M. Jean Paul Laurens.—M. Charles Meissonier has presented to the Bibliothèque Nationale six original copperplates engraved by his father.—It is proposed to suppress the beautiful Château Gaillon, which now occupies the beautiful site in the department of the Eure.—The death is announced, at Lyons, of Jean Baptiste Poucet, the

painter, who was a pupil of Hippolyte Flandrin. Among other works, he engraved, for the City of Paris, the fine paintings by his master which decorate the church of St. Germain des Prés.—The death is also announced, at the age of fifty-three, of the painter Georges Moreau de Tours, pupil of Cabanel. He leaves behind him some important military pictures painted with great power of conception and composition. He had obtained a silver medal in the Exhibition of 1889, and a gold medal in the recent Exhibition. He was a member of the Société des Artistes Français (old Salon), and most of his larger works had been purchased by the State—among them "La Drapeau," which is at the Elysée Palace, and the "Mort de Vaneau," which is at the Ecole Polytechnique; "La Famille," and the "Sacrifice à la Patrie," at the Mairie of the Second Arrondissement; the "Vive la France" (Dinan Museum), and the "Hypnoticists" (Reims Museum).—We have also to record the death, at the age of sixty, of M. Ernest Barden, architect to the department of Corrèze, and President of the Société Régionale des Architectes du Limousin, Périgord.

GERMANY.—Extensive canal construction is about to be made in Germany. At the opening of the Prussian Landtag on Tuesday the 8th inst., it was announced in the speech from the throne that what is known as the Canal Bill is to be brought in during the present session, and it seems to be no doubt of its passing into law as the schemes have, on the whole, been favourably received. The bill comprises not only the Rhine-Elbe canal scheme, but provides for the construction of a water-way for large ships between Berlin and Stettin, a better water-way between the Oder and the Vistula, the further regulation of the Warthe, an improved regulation of the tide on the Lower Oder and Lower Havel, and the amelioration of navigation on the river Spree.—The scarcity of dwelling-houses in many parts of Prussia is also engaging the serious attention of the authorities, and the construction of better roads is under consideration.

BULGARIA.—An important archaeological discovery has been made at Aboba. During the past year excavations have been carried out under the direction of M. Uspenski, chief curator of the Russian Archaeological Institute at Constantinople, on the site of what was believed to have been an ancient military camp. This has now been shown to be the remains, not of a camp, but of a town which was the residence of the earliest Bulgarian rulers, and was probably destroyed in the ninth century. In the centre of the remains, the ruins of a large castle and traces of a fine cathedral have been brought to light. The castle, together with the churches and buildings for the court officials, were surrounded by a double stone wall, and the whole town was protected by a trench.

CANADA.—Canadian architects have been intensely disgusted by a recent circular emanating from the authorities of the Toronto Industrial Exhibition. It appears that the authorities have invited architects to submit competitive designs for a new main building and several subsidiary buildings to be erected on the exhibition grounds to meet the requirements of the proposed Dominion Exhibition next year. The cost of the main building is estimated at 100,000 dols., and of the lesser buildings from 5,000 dols. to 15,000 dols. each. Indignation is felt on the ground that the author of the accepted design for the main building is to be awarded a prize of only 250 dols., and smaller buildings in proportion, seeing that plans, elevations, perspective, and a brief specification are to be provided, the premium is regarded as inadequate.

MISCELLANEOUS

PRIMITIVE METHODIST CHAPEL, BACKWORTH, NORTHUMBRIA.—A Primitive Methodist Chapel has just been opened at Backworth. It accommodates 300 persons, and was designed by Mr. J. R. Nicholson, and erected by Messrs. Bolam & Davison, of Birtley.

CALVARY, EAST BOURNEMOUTH CEMETERY.—A large Calvary has been erected in the Catholic portion of the new cemetery at East Bournemouth. The Calvary is of granite from Dartmoor, and consists of steps on a cairn of rough granite, upon which is a monolith over 12 ft. in height, the upper part of which is formed into a wheel-like cross. The work was designed by Sir Francis L. J. Barrow, Bart., and executed by Messrs. Harry Hems & Sons.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A meeting was held on the 14th inst., Mr. Alex. Davie, president, in the chair, when a lecture entitled "An Architectural Craftsman's Visit to Italy" was delivered by Professor Gourlay. The lecturer began by recommending all architectural craftsmen to make at least one visit to the Continent, though for a short time only, to enable them to realise their insular position, and, further, as an incentive to reading and study. Whether disappointed, satisfied, or exalted feelings pervade one when studying a building on the spot, the result of the study of worthy buildings either at home or abroad is to inspire the student to greater excellence in his future work than he has gained in the past. Beginning with Venetian architecture, a bird's-eye view of Venice was shown on the screen, and the many parts of the city and its buildings were

pointed out. Thereafter, views of buildings showing Byzantine, Gothic and Renaissance work in Venice, Ravenna, Verona, Milan, and Vicenza were shown. Passing to Tuscany, the Romanesque, Gothic and Renaissance architecture of Florence, Siena, Pisa, Pistoja, and Prato were reviewed. Finally, the ancient, early Christian and Renaissance architecture of Rome.

NEW ACQUISITIONS AT SOUTH KENSINGTON MUSEUM.—At the death of Mr. Henry Vaughan some valuable works of art passed by bequest into the South Kensington Museum collections. An Italian late fifteenth-century bas-relief in white marble of a female head and bust in profile is one of the most important items. The examples of carved woodwork include a walnut frame attributed to the Barili, uncle and nephew, who worked at Siena and Rome in the early years of the sixteenth century; two Italian carved-walnut mirror frames, and several panels of French workmanship dating from the brilliant period of François I. Two large studies in oil by J. Constable, R.A., for many years on loan at the Museum, were included in this bequest, as well as two drawings by Turner, placed, with the other water colours by the same artist, in the galleries, representative collection of lace, amounting to 114 pieces, has been recently given to the Museum by Mrs. Ambrose Rathborne. It fills three small cases, placed at the south-west corner of the loan court. Of Venetian raised or "rose-point" lace of the seventeenth century there are five borders, and there are also two pieces of same case is a fine needlepoint falling collar, of the middle of the seventeenth century, with raised flowers. There are also examples of somewhat later needlepoint laces of Alençon and Argentan. Several specimens of Flemish pillow-made lace of the seventeenth century, and borders from Brussels, Mechlin, and Valenciennes, of the eighteenth century, are also included in this collection, together with examples of fine white silk lace of Normandy, the "blonde de Caen" the production of which has now almost quite died away, giving place to machine-made imitations. There are one or two specimens of English and Irish laces of our own time.

ELECTRIC LIGHTING BOARD SYSTEM.—We spoke with approval, some little time since, of this system of electric lighting, known for brevity as the "E.L.B." system. It was then exhibited as a demonstration; but we learn that the system has been put into practical operation on a large scale in producing the effects in the Palace of Glass scene in the Drury Lane pantomime, and in the ballroom scene at the Hippodrome.

SOUTHWICK, DURHAM.—There being seven or eight places in the United Kingdom bearing the name of Southwick, as well as another recently created urban district of that name, the Southwick Urban District Council in the County of Durham, with the consent of the County Council, decided at a meeting on the 8th inst. to change the name from that date to "Southwick-on-Wear Urban District Council," and the name of the place to "Southwick-on-Wear." The object is to prevent a continuance of the miscarriage of, and delay in delivery of, letters, parcels, and goods.

MASTER BUILDERS' ASSOCIATION DINNER, HEREFORD.—The Hereford and District Master Builders' Association held their fourth annual dinner at the Mitre Hotel, Hereford, on the 10th inst., Mr. Lewis Hodges (President of the Association) presiding. After the loyal toast, which was given from the chair, Mr. Ramsden proposed the Town and Trade of Hereford, and Mr. Alderman Beddoe and Mr. Protheroe replied.—Mr. A. J. Corner gave the toast of "The National Association," coupled with the name of Mr. A. Krauss, of Bristol, who, he understood, would very soon occupy the highest post that the National Association could confer, and who had given time, brains, ability, and a great deal of money towards bringing the National Association to the position it now occupied.—Mr. Krauss, in response, congratulated the Hereford Association on its flourishing and peaceful condition. Speaking of the relations between engineers and contractors, he said his experience was that the more friendly terms they were on the better was the work done. He mentioned that the representatives of the four affiliated of the National Association had met at the Plasterers and closer relations with kindred associations. After a lengthy discussion, they arrived at four distinct points on which they would welcome kindred associations—(1) that we cannot recognise any members except they are affiliated to their local associations; (2) rule 3 to be admitted; (3) no one to be admitted if he is a member of a trades-union; (4) no monetary bond to be required. It came out that some plasterers and joiners belonged to some of the associations and also to the trade society. This could not and must not be, as a man could not serve two masters. There was to be a meeting to meet the kindred associations, and a good result was hoped for.—Mr. W. P. Lewis, sen., in giving the toast of "The Architects and Surveyors of Hereford," stated that they joined to be troubled very much about the contract forms, but since they had adopted the contract form approved by the Royal Institute of British Architects and the National Association of Master Builders, things had been much more satisfactory. Twenty of these

forms had been sold by their secretary during last year. In this form there was an arbitration clause, which was chiefly what they had been asking for, and also a strike clause. One little clause the builders got in the specifications generally, was as to the details that were to be provided thereafter. By the new contract form, if the builder considered these details to be excessive, and falling agreement about them with the architect, he could refer the matter to an arbitrator. He did not think there was a man who would not say such an arrangement was fair and just. The toast was coupled with the names of Mr. E. H. Lingen Barker, Mr. John Parker (City Surveyor), and Mr. E. G. Davies.—Mr. E. H. Lingen Barker replied, and said as to the form of contract he did not think architects were competent enough to decide all points, and apart from that he did not think they were the proper persons to do so, even if they were competent; and therefore a reference to a person entirely outside the work was most desirable. As to the relations between masters and men, the men were apt to tell the masters and accuse them most unjustly of taking all the benefit that arose from low wages, but this was not so. Builders put, and very properly put, an extra price on their contracts, if they had to pay their men more money, and the consequence was the building public hesitated to build. He had four works in various parts of the county at the present time absolutely waiting because the price of building was too high. These people would not go on with the building because they told him they could not find the money, seeing that building prices were raised 25 or 30 per cent. It had occurred to him what a desirable thing it would be if they could have some way or other of getting working-men, because many of them were exhibiting substantial and ordinary of the matter. If they knew that the fact of asking for higher wages would prevent builders carrying out their contracts, and so employing them, thinking working men would hesitate before they pressed these demands on the masters.—Mr. John Parker also replied, and said the authorities had been able to get the builders to rise to the proper point in exhibiting substantial and ordinary of the matter. Mr. E. G. Davies having also spoken, Mr. Gilbert Davies submitted the toast of "The Hereford and District Master Builders' Association," and said the society existed for the purpose of preventing these unfortunate disputes which had so long disgraced the country.—The President stated that as one looked back over the past one could not help feeling surprised that the master builders of Hereford had existed so long unassociated. They did not set themselves up to defy the men, but if they could not settle matters in a reasonable way they meant to stand their own ground, which they could not do before the Association was formed. Mr. J. Davies proposed "The Guests," and Messrs. H. C. Beddoe and A. J. Corner responded.—Mr. T. A. King proposed "The President and Officers," the toast being acknowledged by the President (Mr. Hodges), the Treasurer (Mr. William Bowers), and the Secretary (Mr. W. P. Lewis, junr.).—Mr. C. Cooke thanked the members for having elected him to the position of vice-president for the ensuing year.

INTERNATIONAL BUILDING TRADES EXHIBITION.—This exhibition opens on April 17, and will continue open until the 27th. It is stated that it promises to be larger and more varied than the previous one of 1899. A special feature will be a section devoted to fire prevention materials, which is being held under the direction of the British Fire Prevention Committee. It will include exhibits by firms manufacturing specialities in the way of non-combustible materials, and a number of exhibits will be on view that have been under the very rigid tests of the Committee. The Smoke Prevention Committee, under the chairmanship of Sir Wm. Richmond, R.A., will hold an exhibit of appliances. A further feature of interest will be an exhibition of drawings by architects.

COUNTY COUNCIL TECHNICAL INSTITUTE, SHOREDITCH.—A day school for boys who propose to enter some branch of the cabinet-making, joinery, or other woodworking trades will be opened in the London County Council Shoreditch Technical Institute on January 22. Among the subjects of study to be included are:—Arithmetic and mensuration (general); geometry and geometrical drawing; freehand and model drawing; modelling in clay; technology of woods and tools (notebook lessons); bench work (use of woodworking tools, &c. Second and third year courses will be provided, and in the third year a somewhat higher degree of specialisation will be permitted. The Institute is well equipped with classrooms, drawing offices, art studios, and shops for cabinet-making and manual training in woodwork, carving, upholstery, polishing and other branches of the furniture trades, while laboratories for physics and experimental mechanics and for practical chemistry are being provided, and will be completely equipped in the course of a few months. The school will at first be under the control of Mr. S. Hicks, who holds a certificate of the Board of Education as a trained teacher, and of an instructor who is an efficient foreman cabinet-maker, besides being a registered teacher of the City and Guilds of London Institute, with an Honours qualification. The services of additional teachers, especially in experimental science, will be secured

as required. The object of the school is to enable boys who intend to enter some branch of the furniture or other woodworking trades to continue their general education, and at the same time to acquire such a knowledge of the artistic principles of design, and of the scientific principles of construction, of the properties of materials, and of the use of tools, as will enable them at the end of a two or three years' course, to enter a workshop with a full appreciation of the points to which they are expected to direct their attention, and with an intelligence so trained as to make them immediately of substantial value to an employer.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES DURING DECEMBER.—The *Labour Gazette* for January reports that employment in the building trades declined in all branches during December. The percentage of unemployed union members among carpenters and joiners at the end of the month was 4.2, compared with 3.2 in November. The percentage for December, 1899, was 2.5. The London report is as follows:—The building trades are not so well employed, though but little change has taken place during the month. Returns from 188 branches of eight unions paying unemployed benefit, with a membership of 13,787, show that 522 (or 3.8 per cent.) were unemployed, compared with 37 per cent. in November, and 0.8 per cent. in December, 1899. The carpenters and joiners and stonecarvers describe employment as quiet, the bricklayers, tinsmiths, masons, and painters and decorators as dull, the plasterers and plumbers as bad. The single dispute which commenced during the month was at Blackpool and St. Annes, and affected 208 carpenters and joiners. It was in reference to a proposal of a reduction in wages of 1d. per hour. No settlement has been reported.

HALIFAX BUILDING TRADE DISPUTE.—On the 14th inst. the joiners in the employ of one of the Halifax building firms, who have been on strike 105 weeks, returned to work, a settlement having been effected through the medium of the Halifax Building Trades Federation. The agreement involves concessions on both sides. The employers concede 3d. per hour advance and an allowance for the grinding of workmen's tools, and the men consent to a modification in the employers' favour of rules 3 and 4. The terms of agreement are to extend to the whole of the operative joiners in the district. One of the items is that there shall be an annual October conference of masters and men, at which all trade questions shall be considered.—*Sheffield Telegraph.*

LEGAL.

DISPUTED LIABILITY FOR DRAINAGE WORK.

In the Westminster County Court recently, his honour Judge Lumley Smith, Q.C., tried the case of *Dombey v. Somerset*, in which the plaintiff, who is the landlord of premises known as 79, Upper Gloucester, Regent's Park, sued the defendant, his tenant, who held the premises under a lease, to recover the m. of 45l. in respect of drainage work which was carried out by the order of the Marylebone Vestry. Mr. Longstaffe (barrister) appeared for the plaintiff, and Mr. Spokes represented the tenant. In opening the facts of the case, the plaintiff's counsel said the question involved was one of considerable importance as between landlord and tenant, as to which of them were liable to pay for drainage work carried out to the order of the Vestry Authorities. The premises in question were to the defendant under a lease dated May 24, 1894, and there was a clause in it by which the tenant undertook to pay all rates, taxes, assessments, charges, and outgoings, and it was upon the latter that the present action was based. On May 4, 1900, a notice was left at the house by the Marylebone Vestry, requiring certain work to be done to the drains, but the defendant refused to have it carried out, and consequently the plaintiff, in his capacity of landlord, was bound to have it done, and now sought to recover the amount from his tenant.

The plaintiff was called and gave evidence in support of his counsel's statement. Mr. Gorlist, the Sanitary Inspector to the Vestry of Marylebone, was called, and said the work which was carried out was absolutely necessary as the drains were old fashioned and very imperfect, and constituted a nuisance within the meaning of the Act.

For the defence Mrs. Somerset was called, and said that during the whole time she had been in the house she had never noticed any bad smells, or suffered any inconvenience or injury to health, though she and her daughter slept in the basement. The learned Judge, after hearing a lengthy argument on both sides, and having consulted a number of authorities on the point, said he thought he was bound by the case of *Rawlins v. Briggs*, 3 C.P.D., and gave judgment for the defendant with costs, would, however, he said, grant a stay of

execution for fourteen days to give the plaintiff an opportunity of lodging notice of appeal.

ACTION BY A PAINTER'S WIDOW UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

The case of *Dredge and Another v. Conway, Jones, & Co.*, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Collins and Stirling, on the 11th inst., on the application of the plaintiffs for leave to appeal from the award of the County Court Judge of Gloucester in favour of the defendants, the masters, under the Workmen's Compensation Act, 1897. Mr. Ruegg, Q.C., and Mr. Morton Brown appeared in support of the application; and Mr. Arthur Powell opposed it.

Mr. Ruegg stated that the plaintiff was the widow of a painter, and the learned County Court Judge had given leave to appeal, and had assessed the damages the plaintiff would be entitled to if the Court of Appeal took the view that her husband came within the benefit of the Act at the time that he met with the accident. The judgment the plaintiff desired to appeal against was dated November 20 last, and the time for entering the appeal expired on December 11, or twenty-one days from the date of the judgment. The solicitor who represented the plaintiff had asked for a stay of execution in order to see what was best to be done in his client's interest, and the County Court Judge stayed execution for two months. The solicitor erroneously thought that the stay for two months enlarged the time for putting down the appeal, and it was not until December 19 that a consultation was arranged with counsel to advise whether the appeal should be proceeded with. He (Mr. Ruegg) had pointed out that the time for appealing had gone by, and, as he advised the appeal, this application to extend the time was made on the earliest opportunity. Their Lordships would remember that they had held that repainting a house from a ladder was neither work of "construction or repair," and in that case that the masters were not "undertakers" and liable to pay compensation to the workman's representatives. The House of Lords, however, reversed that decision, and had held that the words "construction, repair, or demolition of a building" covered every class of work which could be done to a building by a workman. The point no doubt would be taken, on behalf of the masters, the defendants, that as the House of Lords' decision was not given until December 10, the plaintiff only then decided to appeal, and had been led to make the present application only after seeing a report of the case in the Press. Mr. Ruegg assured the Court that the only reason of the delay was the mistaken belief of the solicitor that the County Court Judge had extended the time for appealing.

Mr. Powell in opposing the application said that but for the decision of the House of Lords the appeal in the present case would have been hopeless as the deceased man was "whitewashing" a ceiling at the time of the accident. His submission even now was that "whitewashing" was not "repairing" within the meaning of the Act. If it were then a man cleaning windows would come within the Section. He asked the Court to look with suspicion on the statement that the decision of the House of Lords over-ruling the view of the Act taken by the Court had really nothing to do with the delay in setting down the appeal. He asked the Court to dismiss the application.

The Master of the Rolls in giving judgment said that the County Court Judge had found, assuming the widow could show that her husband came within the benefit of the Act, that she would be entitled to some 250l. Having regard to the importance of the matter and that the solicitor had filed an affidavit taking upon himself the sole responsibility for the blunder, he thought that the leave asked for should be granted.

The Lords Justices concurred. Mr. Ruegg stated that the appeal would be set down that day.

ACTION AGAINST BUILDERS.

The case of *Hardman, Powell, & Co. v. Johnson & Co.* and *Another* came before Mr. Justice Bigham, sitting without a jury, in the Queen's Bench Division on the 11th inst. Mr. A. T. Lawrence, Q.C., and Mr. Rowlands appeared for the plaintiffs; and Mr. H. F. Dickens, Q.C., and Mr. Montague Lush for the defendants.

It appears from the statement of counsel that the action was brought by the plaintiffs to recover from the defendants the sum of 237l. 15s. in respect of art ironwork done in the new Palace Theatre, Plymouth. In January, 1897, a Mr. Pocock, one of the defendants, entered into a scheme to buy some land at Plymouth, and convert the then existing structure upon the land in Union-street into a theatre and hotel. Negotiations were commenced in January, 1897. The following month a syndicate called London & Devon, Limited, was formed with a nominal capital of 50,000l., and Mr.

Pocock was interested in it. Messrs. Johnson & Co. were the builders of the theatre and hotel, and in their contract provision was made for the fittings, which formed the basis of the present action. Mr. Pocock was financing the business, and advanced about 70,000l. for which he ultimately got 130,000l. in debentures and 10,000l. in shares in a company which was formed and called the County Theatre and Hotel Company, Limited. The sole point in issue was whether the London and Devon, Limited, were the persons for whom this work was done by the plaintiffs, or whether Mr. Pocock was the principal on whom rested the liability.

In the result, the action was settled on the terms that Mr. Pocock was to pay to the plaintiffs within six months debentures in the company for the sum of 450l. in settlement of the plaintiffs' claim. Mr. Pocock to have the option of buying back the debentures at the price of the claim within the six months, but if at the end of that period the debentures were not handed over to the plaintiffs, then there would be judgment for the plaintiffs for the amount of the claim without costs. The plaintiffs were ordered to pay the costs of Messrs. Johnson & Co. The record was accordingly withdrawn, and a second action in the list, *Verity's, Limited, v. the same defendants*, was settled on similar terms.

CLAIM BY A QUANTITY SURVEYOR AGAINST AN ARCHITECT.—IMPORTANT CASE.

The case of *Leach v. Arber* came before Mr. Justice Bigham, sitting without a jury, in the Queen's Bench Division, on the 14th and 15th inst. The facts sufficiently appear from the following judgment:—

Mr. Justice Bigham, in the course of his judgment, said the action was brought by the representatives of a gentleman named Robertson, a quantity surveyor, who had died, to recover from the defendant a reasonable sum for the preparation of some specifications required for the construction of a theatre and hotel at Plymouth. The question his lordship had to determine was whether in the whole of the circumstances he could find an implied promise on the part of the defendant to pay for the work. It was admitted by the plaintiff that there was no express promise on the part of the defendant to pay for the work. The work which was done consisted of the preparation of some specifications. A Mr. Earl in 1897 was employed by Mr. Robertson to assist him in the preparation of the bills of quantities for the theatre and hotel in question, and he was employed by Mr. Robertson on the terms that the remuneration that Mr. Robertson was to receive for the preparation of the bills of quantities should be divided equally between them. That was the contract existing between Robertson, the employer, and Mr. Earl, the servant, and the contract had been fully carried out. Mr. Earl assisted Mr. Robertson in the preparation of the bills of quantities, and received from Mr. Robertson in his lifetime the remuneration he was entitled to, and so there was an end of that. When the bills of quantities were about to be prepared, Mr. Robertson appeared to have discovered that Mr. Earl had in his possession the plans and specifications relating to a theatre in Edinburgh, and it seemed to have been thought that these plans and specifications might be of some assistance to the defendant, who was the architect for the buildings in question, and in the work which the defendant as architect had to do. On April 15, 1897, Mr. Robertson wrote to the defendant a letter stating that he sent the plans, but that the specifications for the moment had been mislaid, but that they would be searched for and sent on in due course. Mr. Earl said, in the witness-box, that the statement in the letter that the specifications had been mislaid was untrue, and that it was so stated to afford some sort of excuse for not showing the specifications to Mr. Arber. His lordship very much doubted whether he ought to accept Mr. Earl's evidence about that. He was rather disposed to think that the letter was perfectly honest, and that Mr. Robertson, when he wrote it, thought that the specifications had been mislaid. A great deal of discussion had taken place as to what happened at an interview between Mr. Arber and Mr. Earl. Mr. Earl's version of the interview was that he had a talk with Mr. Arber as to the preparation of the specifications for the theatre—there were two specifications, one for the foundation and the other for the superstructure. That Mr. Arber told him (Earl) that it would be a great assistance to him in the preparation of the plans if he could be furnished with a specification, and then asked Earl to prepare it. Earl said that if he did, he should require to be paid for the work by somebody; when Mr. Arber replied that he would take care to make the necessary arrangements with Mr. Robertson for the payment by Robertson for the work to be so done. Mr. Earl had admitted that it was a very unusual thing to prepare specifications before plans were prepared, but explained its being done in this case by saying that Mr. Arber was a tyro in connexion with such work as the preparation of plans for a theatre, and wanted these specifications in order to supply him (Arber) with the necessary information and guidance for the preparation of the plans which he had to prepare as architect. In these circumstances, Mr. Earl said I

* See the *Builder* for April 1, 1899, p. 332, and December 15 last, p. 531.

proceeded to draw out the specification for the theatre. Mr. Arber's version of what took place at that conversation was that he never said or did anything to convey to Mr. Earl the idea that he was intending to pay for the specifications at all, or that he was in any way requesting Earl to make them out for him. Mr. Arber had said, and his lordship believed him, that it was by no means an uncommon practice for quantity surveyors to prepare the specifications and to send them to the architect. Mr. Arber had pointed out that that course of business was very often advantageous to the quantity surveyor, because he was able to prepare his bills of quantities with greater ease and with greater exactness upon a specification which he had taken the trouble to prepare himself than he would upon a specification which was prepared for him by the architect. His lordship thought that it was the common practice to do the work in that way, and that in the present case the specification was not prepared by the architect, nor prepared at the architect's request, nor in such circumstances as to raise, in his lordship's opinion, an implied promise by the architect to pay the person who prepared it. His lordship accepted Mr. Arber's account of what took place at the interview between himself and Mr. Earl on April 15 and 16, and did not accept Mr. Earl's. He had said that after that interview Mr. Earl did draw out the specifications, and in this connection he (his lordship) might refer to the later specifications which were drawn out in October. In his opinion, in the same circumstances those specifications were drawn out for the benefit of Mr. Robertson. They were drawn out by Mr. Earl, and were used by Mr. Robertson in the preparation of the bills of quantities which were used by Mr. Arber in his capacity as architect. He thought the work which was done by Mr. Earl in connection with the specifications for the theatre was almost entirely desk work, and consisted of little more than a copy of the specifications which he had in his possession relating to the Edinburgh theatre. The specifications were altered to some considerable extent by Mr. Arber when he came to exercise his mind as architect upon them. He thought that the work done by Mr. Earl in connection with the preparation of the specifications was really very small. Mr. Arber had said that 25% would be ample payment for the work, and his lordship was not at all sure that Mr. Arber was not right. But he would say this—so that this part of the case might be once and for all disposed of—if it should in some other court turn out that he was wrong in holding that Mr. Robertson's executors were not entitled to recover in this action, he found as a fact that 20% would be sufficient payment for the preparation of these specifications. He considered that that would be ample payment for the work done. He was of opinion that Mr. Arber was not in any way liable to pay that sum, and if it were necessary he should say that Mr. Robertson's estate was not liable to pay it either to Mr. Earl. That, however, did not come within his lordship's province to decide. He held a strong opinion that what Mr. Earl did was nothing more than a service for which he got paid by Mr. Robertson in the latter's lifetime, and that he had no claim against anybody for payment in respect of these specifications. Now, what happened after April 16? On April 22 Mr. Earl said he made an agreement with Robertson that he was to get 1 1/2 per cent. for preparing these specifications. His lordship did not believe there was any such agreement at all. He saw nothing in the correspondence, or outside it, to lead him to suppose that any such agreement was made. The work of preparing the specifications was done by Earl under his retainer from Robertson. In other words, it was part of the work which Earl was expected to do for Robertson, and for which Robertson paid him in his lifetime by giving him one-half of the commission received by Robertson in respect of the preparation of the quantities. His lordship then dealt with the other letters which had passed between Mr. Earl, Mr. Robertson, and Mr. Arber, bearing on the case, and said that on March 13 Earl wrote a letter withdrawing his claim against Mr. Arber. On the strength of that withdrawal Mr. Robertson got payment for the bills of quantities and gave a receipt, which included a charge for lithographing the specifications. In his lordship's opinion that included all the claim which Mr. Robertson had against Mr. Arber in respect of those specifications. Never in his lifetime did Mr. Robertson make such a claim as his representatives were now seeking to enforce. Earl brought an action against Robertson, but failed, and, as his lordship thought, quite properly failed. Then for some reason Robertson's executors brought the present action against Mr. Arber. His lordship was sorry to find that the estate was being spent in litigation of that kind when it ought not to be used for any such purpose. He must enter judgment for the defendant with costs.

Mr. Nepean appeared as counsel for the plaintiff, and Mr. Willes-Chitty for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

18,204.—**BURNERS FOR COOKING-STOVES, &c.**: F. Trendel.—For atmospheric acetylene burners the mixture of air and gas is provided for by the

insertion of a short mixing-pipe in the main mixing-tube, the gas nozzle being placed adjacent to the entrance to the mixing-tube. In order to prevent the mixed air and gas from being intercepted at the mixing-pipe's outlet, a space is made between that pipe and the mixing-tube; the latter arrangement will moreover maintain the velocity of inflow at an even rate.

18,250.—**METHOD OF REMOVING PROPS**: H. J. Taylor.—For the withdrawal of props from mines are devised a rope and chain, which are secured to the hook of a sliding tubular nut or sleeve, to be drawn inwards with a screw that is turned by a hand-lever and level wheels; a pin that is screwed through a casing into a key groove in the tube prevents the tube from rotating, whilst on the screw's end is a thrust-nut formed with grooves wherein anti-friction balls are placed.

18,257.—**FIREPROOF MATERIALS**: *Simmons & Bocks*.—Slabs, bricks, sheets, &c., are fashioned of an admixture of cement (seven parts), asbestos (about twenty parts), zinc oxide (from three to ten parts), and weak glue water, which is laid upon a backing of wire netting, jute, and so on. They are next pressed and impregnated with a solution of sulphate of alumina. For a covering of floors and walls the mixture is made of cement, asbestos, and water glass; and for roofing purposes the sheets or plates are rendered waterproof with a compound of alum (six parts), sugar of lead (two parts), and soda (one part).

18,265.—**A PAINT-SPRAYER**: C. L. Burdick.—An air-valve is mounted on the central part of the tool, which comprises a handle, a nozzle, and a reservoir. The supply of paint or pigment is regulated with a pin valve, to be closed with a spring and opened with a forked lever at the drawing back of the thumb-piece, to which is joined a link that acts upon the air-valve's spindle, whereby the supplies of air and of paint are separately regulated. In order that the spring shall not close the pin valve too tightly, the forked lever is held up by means of an annular cam's lug that projects through the casing. In a modified shape of the tool for doing coarse work, the pipes which are joined on to the reservoirs of air and paint constitute the handle. On the sleeve which carries the paint valve is a stud which is linked to the air valve, and has an adjustable stop which controls the opening. A separate reservoir, having a valve in its stem, may be affixed to the handle, just below the nozzle.

18,335.—**ARC LAMPS**: H. Bremer.—In order that the carbons shall present a large sectional area, they are fashioned as flat plates or groups of rods, and to produce long arcs that shift about quietly, the carbons contain at least 5 per cent. of calcium or magnesium fluoride or bromide; further, to obviate flickering, they are made up with certain portions of calcined salt of potassium, sodium, or boron, and after they have been rendered red-hot and immersed in a fused salt of boron they will assume a glass-like coating which will absorb their residual slag.

18,352.—**JOINTS FOR PIPES**: S. R. Dresser.—In the case of butt and expansion joints, a joint between the plain unthreaded ends of large pipes is effected by means of divided sleeves, which are bolted on to the pipe ends, and will at the same time provide for any slight movements arising from contraction or expansion, through the sleeves themselves; the sleeves are recessed for packing and over the pipe-ends is placed a coupling-sleeve of any gland; in another shape the divided sleeves are flanged with additional projections upon their sides that can be bolted together.

18,353.—**MANUFACTURE OF DRAIN AND OTHER PIPES**: C. J. Kitzberg.—The mould in which cement pipes may be cast has an internal core, and an external casing made in two parts, the latter is locked in position upon a wooden pallet. After the mould has been filled with cement a spiral flange turns the core and raises it through the cement. As the cement is lifted to the top the flange's horizontal part smooths away the pipe's upper end, when the cast pipe within the casing is carried upon the pallet to the drying-yard, it is left to become dry upon the pallet, the casing having been removed.

18,378.—**BENCH-CRAMPS**: E. Arnold.—A screw serves to adjustably fix to a stem's head the jaw of a piece which clamps the work on to the bench. In that piece is a groove into which the stem's head will fit, and there are holes in the bench that receive the stem which may be serrated, screwed, or plain, and is retained in its place whilst it is being used by its jamming against the hole's sides.

18,379.—**PLUG COCKS**: F. M. Ashley.—A valve projection, with a packing and a gland, which is fixed with a sleeve upon the spindle, is disposed within a central opening of a collar fastened with a nut on to the plug cock's casing; the valve is lifted or lowered when the sleeve is turned, and without changing the degree of compression of the packing; for clamping the gland to the valve's spindle lock-nuts can be employed, and the gland may be formed integrally with the sleeve, so that it can be screwed into the opening cut in the collar.

18,407.—**A HOLD-FAST FOR PIPES**: E. M. Edwards.—A projection which is either fastened or fashioned upon the pipe is so formed that it will engage with a slotted receiver upon the plate which

is to be affixed upon the wall; in the receiver or holder the hole through which is passed a pin that secures the pipe in position as keyed in the slot of the plate.

18,442.—**BRICK, TILE, AND BLOCK MOULDING**: R. Stanley.—Before the insertion of the rough material into the mould of the press, a coating of clay slip, oxide of iron, or oxide of manganese, to which a lubricating or other liquid may be added at option, is injected into the mould in order to allow of inferior clay being used for the body of the brick or tile, and to give it a surface having the desired vitrification, colour, and finish. By one form of the invention the slip is forced from its feed-chamber through a pipe and the pierced lining-plates of the mould by means of a current of air or steam, the supply of slip into the chamber being regulated with a cam, rod, lever, and springs. The lever opens a valve for the admission of compressed air or steam into the chamber when the valve has been shut, and before the valve has been again opened a spring acts so as to liberate the valve. The mechanism further provides for the supply to the mould of a half-dried and powdered material, as well as of coloured dust. The specification includes an arrangement whereby slips can be drawn from the sides and bottom of the mould, and the invention is described as being adapted for use with presses after various kinds, together with the press which is specified in No. 7,297 of 1898.

18,480.—**INCANDESCENT LAMPS**: *Siemens and Halske Aktiengesellschaft*.—For their connexion with metal wires, tubes, strips, &c., the ends of incandescence bodies that will conduct only when they become heated are coated with some suitable material, and are then reduced to a white heat until they become so plastic that the wires or strips can be pressed into them. For coating the ends they are heated and dipped into powdered boron, silicon, or refractory metals, such as manganese, molybdenum, titanium, chromium, nickel, and platinum metals and their alloys, for which however, may be substituted their oxides, phosphides, carbides, or nitrides, and the coating compounds may be applied in the shape of a paste mixed with hydrocarbons or water.

18,497.—**DRAWING-BOARDS, &c.**: F. Tray.—With the object of preventing the board from warping it is composed of sheets of veneer, which constitute both its back and front, the sheets of veneer being fastened to a set of slats placed between them, which interlock transversely and are inserted within a frame-sided frame.

18,512.—**GAS STOVES**: H. Lide, and Presta Gas-Cook and Components Company.—Upon the stove's hot-plate is mounted a hot closet divided into two stages and having two separate doors, the upper stage has removable shelves and the partition between the two stages is also removable, the metal closet may be lined with wood or some other non-conducting material and fitted with a grate, thus forming a cupboard for warming articles of food and for drying garments, &c.; it is to be heated by the burner and can be heated, further by waste gases from the stove.

18,517.—**AN APPLIANCE FOR WINDOWS**: A. Nesemann.—Cords that are passed over pulleys join together the two horizontal halves of the window so as to balance the one half with the other, and the cords are caused to slide within recesses, formed in the wall, as the window is being opened.

18,545.—**FIRE-GUARDS**: S. Muir and W. E. Speak.—The guard's front and wings are pivoted together upon a common axis, and are so arranged as to open out at the meeting edges of the wings are stopped by the edges of the front; an adjustable bracket, mounted upon a carrier, and consisting of a dove-tailed piece with a screw-pin, is secured to the guard's upright bars, or the bracket-carrier, having horizontal holes for the rods which constitute the bracket or carrier, may be made of a bar which connects two of the uprights, two screw-pins being used for fastening purposes.

18,550.—**A LINING FOR TUBES AND CONDUITS**: A. M. Louche.—An electrically-insulating lining is laid within the metal tube or pipe, and is then expanded so as to fit tightly against the tube with compressed air or live steam injected through a nozzle that fits into one end of the tube. For an insulating material the inventor prefers a compound of sulphur, a vegetable oil, zinc or lead oxides, &c., mixed with fibrous substance, waste rubber, with chalk, &c., for a filling, and some such adhesive material as tar, resin, gums, asphalt, and tana gum, or balata in place of rubber is prepared and spread upon one side of a sheet of light fabric, such as paper. After the sheet has been coated with a suitable adhesive cement it is cut up into strips and the backing is taken away along one edge, when the strip is bent round and inserted into the tube. When the lining has been expanded and fitted within the tube the paper backing is stripped away with a rod to which one end of the bare backing is secured, so that the insulating lining shall remain closely against the tube's inner surface.

18,570.—**SAFE AND SIMILAR LOCKS**: J. Lips.—The invention applies to the locks for use in safe-deposits, banks, and so on, which are turned with two keys; the bank's key locks on bolt, and the tenant's key is used for turning the other bolt

so as to lock the former bolt and to cover the banker's key-hole; pivotted levers which a double-bolted key throws into position secure the one bolt, whilst the other bolt has two sets of sliders whereof one set moves only vertically and the other set vertically and, with the other bolt, horizontally; a corresponding slider is engaged by each of the former set of sliders until the bolt has been shot forward, and as the engagement ceases the sliders fall downwards; when it is desired to unlock the safe the locking key is employed for lifting the former set of sliders into their proper positions, in order that the latter set may pass back into their engagement with them, when the bolt is unlocked a pin prevents the drawing out of the tenant's key, but before a new key can be used the pin must be taken away whilst the mechanism stands in the unlocked position.

18,623.—MANUFACTURE OF TUBES: E. T. Wainwright.—Tubes intended for gas, water, and other purposes are manufactured out of helically-coiled puddled iron bars in various ways. The coils, for instance, may be made plain, or so as to overlap at their edges; a coiled tube may envelope an ordinary tube; or the tube may be constructed out of two coiled tubes together. The diameter of the tube fashioned from the puddled bar and coiled upon a mandrel reduced during the process of rolling or working it, the helices being welded to one another.

18,667.—A SELF-CLOSING NON-JERKING STOP-COCK: S. G. Siveron.—Against the seating of a diaphragm which divides the outlet from the inlet, is placed a flexible diaphragm which is pressed by the running water in a container beneath, and has a seating which is pressed with a valve. When the push is forced downwards the flow of water from the container enables the flexible diaphragm to be depressed from above, and so to allow the water to flow directly to the outlet; but when the push is freed the water will flow into the container, whereupon the outlet becomes closed by the gradual pressure of the flexible diaphragm.

18,698.—LAVATORY AND SIMILAR FITTINGS: T. W. Rogers.—For waste fittings the inventor has devised a grating with outlets whose area is equal to or larger than the area of the discharge pipe. The grating fits into a recess in the mouth of a funnel-shaped attachment or receiver, which is secured with a nut on to the bottom of the basin, sink, &c.; instead of the customary plug a disc having its edge faced with india-rubber is used.

18,710.—CANS FOR INFLAMMABLE OILS, &c.: F. Henze, F. Cohn, & W. H. Schmitz.—In order that a flame may not enter the interior of a petroleum, benzine, or other can, the inner side of the filling hole (which has a cap) is safe-guarded with a placed box whose points press outwards against the sieve; a conical sieve is inserted also inside the spout at its base, a same kind of sieve is provided for the air-hole, and the cover which is fixed over it will return back into the can any oil that may be splashed out.

18,747.—FIREPROOF MATERIALS: A. Inschenetzky.—The invention affords a method of impregnating with silica the layers of material of which sheets of asbestos, cardboard, and other substances are formed for use in buildings and other purposes. The mechanism ensures that when the material is wound upon the large drum it shall have first passed in contact with a roller, by means of which a solution of sodium silicate is constantly applied, and shall then pass in contact with another roller which supplies some liquid—a solution of sodium bicarbonate, say—which will decompose the sodium silicate with deposit of colloidal silica. Together with the specification should be read Nos. 5,254 of 1895 and 4,628 of 1898.

18,750.—JUNCTION BOXES FOR ELECTRICAL MAINS: C. G. Fowler, and Reason Manufacturing Co.—Short lengths of cable arranged so as to extend outwards, that they may be connected with the mains, are attached to the junction-boxes of concentric and other electrical mains, whose inner ends are connected to plug sockets which project through an insulating cover-plug from the insulating base upon which they are mounted. Plug sockets that correspond with the cable sockets are fitted on to insulated spiders; over the box may be clamped or screwed a covering plate, the spaces that pass over insulating ridges may be provided for the plugs, which are disposed in pairs.

18,809.—AN ARTIFICIAL STONE: W. Schwarz.—Before the materials for making an artificial sandstone of lime and sand have been mixed together, the unknown amount of moisture which they contain is eliminated, and the compound is afterwards reduced into a plastic condition with water or steam; the component materials should be dried in vacuum-pans, which have revolving wings, that will mix the dried materials whilst they are yet an tano.

18,810.—GAS BURNERS FOR SOLDERING AND KINDRED OPERATIONS: P. Heinz and F. Heinz.—In the case of gas burners whose flame is automatically controlled with the pressure of air within the blow-pipe the air pressure is caused to act upon a little piston, which will operate the gas-supply valve either directly or by means of an electrical relay; the passing of dust into the interior of the burner is stopped by a cup-shaped

nozzle, having a pierced inner cup; flow of moisture is arrested by the turned-in nozzle, and a saliva-trap is added, together with an air-vent, for the space over the piston. When an electrical relay is used for the air piston's working of the gas supply valve, it is arranged that a valve shall be opened by means of the rising of the piston, so as to complete the circuit of an electro-magnet—the burner-cup being filled with fine copper wire—a pilot flame, that is fed with a by-pass, being attached to the burner in both instances.

18,835.—ROAD-BREAKING: H. Gebler.—The apparatus for breaking up a road is to be used as an attachment to a steam-roller or other motor, to which it can be fastened with a pivotted bolt held by a cottar; wheels at the back sustain the frame, and on the axle is mounted a tool-carrying frame, which is retained at the desired angle by means of adjustable stops; a front-bar supports the chisel, which is clamped in its place with screws.

18,851.—WATER-HEATING APPARATUS: J. T. Moxey.—In the case of slow-combustion stoves or water boilers, the hot-water pipes, which are convex-concave in shape, may be used with the channel uppermost or as economisers, &c. For heating greenhouses and for similar purposes the stove has two oval tapered shells, the one being placed within the other, which are joined to top and bottom plates, grooved and bolted together; water-tight joints are made with asbestos or other washers and red lead; the fire grate is made in two portions, that may be hooked on to the bottom plate, so that, upon the drawing out of a rod, the halves will hang down, or it may be made in one piece held at one end with bar buttons and hinged at the other.

18,856.—EXTINCTION OF FIRE: S. Fryer.—The principle of the invention lies in the substitution of a cylinder-shaped container having a hand-regulated valve, for the customary glass bottle, which holds the acid. The container is fixed upon a cap which is screwed upon the top of the machine. When a projecting end is forced downwards, the valve at the base of the container opens and sets the acid free, and the resultant mixed gas and alkaline solution is thereupon discharged through an outlet pipe, the valve having been again closed through the action of a spring; the receiver may be fitted with a piston, which will prevent the pressure of the gas from driving the acid back.

18,863.—CLUTCHES: J. Monkhouse.—Two arms upon the friction ring, which is split at two points, join it to a boss, which is keyed upon the shaft, and from a sliding sleeve spring arms, to the ends of which are pivotted toggles which fasten on to the pulley the drum whereon the ring is expanded; ledges, against which the toggles will bear, are fashioned upon the arms and upon abutments at the ring's free ends.

18,866.—PIPE COUPLINGS: New Haven Novelty Machine Company.—The coupling is devised for joining leaden pipes to one another, as also to wash-basins, baths, gas-meters, &c. A sleeve is put upon the pipe-end, and the screwed and tapered end of a ferrule or coupling-piece is screwed into the pipe; the ferrule is fitted with both the sleeve and the pipe; the flange of the ferrule's screwed collar is segmented that it may be slipped over the ferrule's screw-thread, which is correspondingly slotted. In another shape, applicable for joining two pipes to one another, sleeves are first fitted on to the pipe ends, into which a double-ended plug is then screwed.

18,874.—A CONTRIVANCE FOR USE WITH GAS AND OTHER PIPES: C. A. Weber-Marli.—The inventor's object is to furnish means of regulating the supply of gas, fluid or liquid, in pipes from a distance. Across the supply-pipe he places a piston-valve which is worked with air-pressure through another tube, the air gaining entrance behind the piston through a slot. A Bunsen-flame by-pass is joined beneath the valve and the piston.

18,879.—FACING-BLOCKS, TILES, AND BRICKS: H. F. Webb.—The bricks, blocks, and tiles, intended principally for use in mosaic work, are made with a porous backing of cement and a flux which is applied when in a plastic state and is affixed by fusion at a low temperature, whilst they are faced with layers of porcelain, glass, or some other vitrified substance; keys for taking the setting are fastened upon the rear face of the back of the block or brick.

18,903.—APPARATUS FOR EXTINGUISHING FIRE: A. E. Kennedy.—A system of automatic sprinklers is connected to a tank, constructed as an extincutor, and also to the water-supply in the street; a lever which is tied up with wire that will become fused by fire, holds up the valves of the sprinkler-heads that are carried by the horizontal portion of the outlet pipe, and the fusing of the wire will also allow of the escape of the compressed air which has been forced into the pipes with a hydraulically-worked pump; at the same time, a piston-rod is drawn back by the pressure upon a flexible diaphragm set within the casing, whereupon a tripper is liberated so as to let the acid bottle which is within the tank fall and empty itself into the soda solution, the chemical solution and the gas being then impelled through the pipe to the sprinkler. Collapse of the bellows for opening a valve which admits the supply of water from the street to the sprinklers is brought about by the falling of a non-

return valve, through which the pressure in a containing vessel communicates with the pressure in the tank when the latter pressure has fallen below a certain amount. The drawing back of the piston-rod serves to start an electrical alarm at a station either near or remote.

18,945.—TILED BUILDING-BOARDS: G. F. Gruendler.—Composite blocks for use in constructing ceilings, floors, panels, wainscoting, fire-places, and so on, are made by cementing facing-faces to wooden boards or blocks with an adhesive admixture of lime and fresh Dutch cheese, whereby the combination of the cheese's lactic acid with the lime results in the formation of a cement which contains calcic lactate.

18,950.—CLOSET VENTILATION AND SIMILAR PIPE TRAPS: M. W. Household and P. T. Ardley.—By way of improving the contrivance specified under No. 1,141 of 1895, the inventors devise a valve composed of two calottes, set one above the other upon a stem, which shall control the admission of air that prevents the siphonage of the traps; the lower calotte, bearing against its seating, will rise to allow the air to enter, but will close to stop any overflowing; or the valve seating may assume a vertical shape, the calotte being hung upon a book and pressed with an aluminium spring against its seating; the valve is also adapted for use with ventilating pipes.

MEETINGS.

FRIDAY, JANUARY 18.

Architectural Association.—Mr. Edwin T. Hall on "Flats." 7.30 p.m.

Royal Institution.—Professor Dewar, M.A., on "Gases at the Beginning and End of the Century." 9 p.m.

Institution of Mechanical Engineers.—Fifty-fourth annual general meeting. Election of President and members of council. The first presentation by the Institution of the Williams Premium will be made to Captain H. Kial Smith, and the prizes awarded by the council for the best two papers in the Graduates' Section will be presented to Mr. W. B. Cleverly and Mr. Brees van Homan. The adjourned discussion will be resumed upon the following paper, by Mr. H. A. Humphrey, on "Power-gas and Large Gas-engines for Central Stations," read at the December meeting. 8 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. Malcolm on "Limes, Lathing, Plastering, Cement," &c. (at Messrs. G. Rome & Co.'s, 26, Moles-street). 4.30 p.m.

MONDAY, JANUARY 21.

Royal Institute of British Architects.—Sixth general meeting (ordinary).—1. To read the deed of award of prizes and studentships for 1900-1901. 2. Mr. J. J. Stevenson, F.S.A., on "Difficulties and Hindrances in Producing Good Modern Architecture." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. J. Liberty Tadd on "Elementary Art Education." II. 8 p.m.

Liverpool and Yorkshire Architectural Society.—Dinner.

Liverpool Architectural Society.—(Members' Meeting.) Mr. Ronald P. Jones, B.A., on "The Saranic Architecture of Cairo," illustrated by limelight views. 6 p.m.

TUESDAY, JANUARY 22.

Royal Institution.—Professor J. A. Ewing, M.A., on "Practical Mechanics (experimentally treated): First Principles and Modern Illustrations."—II. 3 p.m.

Institution of Civil Engineers.—Mr. J. T. Ford on "The Present Condition and Prospects of the Panama Canal Works." 8 p.m.

WEDNESDAY, JANUARY 23.

Society of Arts.—Mr. F. B. Behr on "The Proposed High-speed Electrical 'Monorail' between Liverpool and Manchester." 8 p.m.

Institution of Electrical Engineers (Birmingham Local Section).—Inaugural meeting of the section, at the University Buildings, when Dr. Oliver Lodge will deliver an address. 8 p.m.

Northern Architectural Association.—Mr. Jas. Bruce on "Recent Data Concerning Concrete Beams and Concrete Floors." 7.30 p.m.

THURSDAY, JANUARY 24.

Institution of Electrical Engineers (meeting at the Institution of Civil Engineers).—Adjourned discussion on Mr. W. M. Morley's paper on "Capacity in Alternate Current Working." 8 p.m.

FRIDAY, JANUARY 25.

Institution of Civil Engineers (Students' Meeting).—Mr. C. Johnston on "Sewage Treatment." 8 p.m.

Institution of Junior Engineers.—Mr. A. Ross on "Railway Construction," at the Westminster Palace Hotel. 8 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. T. Baird on "Drainage" (at 12, Lower Abbey-street). 4.30 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. M. Arthur on "Legal Points relative to Building." 8 p.m.

SATURDAY, JANUARY 26.

Institute of Junior Engineers.—Anniversary Dinner, Westminster Palace Hotel. 7 p.m.

Dundee Institute of Architecture.—Visit to St. Luke's Church, &c., West Ferry.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Table with 4 columns: Nature of Work or Materials, By whom Required, Forms of Tender, &c., Supplied by, and Tenders to be delivered. Lists various construction projects across different regions like Plymouth, Leeds, and Manchester.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Application to be in. Lists positions such as Borough Engineer's Assistant and Draughtsman.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv, vi, viii, x. & xxii. Public Appointments, pp. xviii & xxiii.

SOME RECENT SALES OF PROPERTY :

Table listing estate exchange reports with columns for location, date, agent, and price. Includes entries for Ullswater, Staines, Brixton, Harlesden, and others.

Table listing property sales with columns for location, details, and price. Includes entries for Hammersmith, Sinclair-rd., and others.

Table titled 'PRICES CURRENT (Continued)' listing various building materials like bricks, tiles, and plaster with their respective prices.

Table titled 'PRICES CURRENT OF MATERIALS' listing materials like Hard Stocks, Rough Stocks, and Grizzlies with their prices.

PRICES CURRENT (Continued). BRICKS, &c.

Table listing prices for bricks and related materials, including 'Dipped Salt glazed Stretchers' and 'Portland Cement'.

Table listing prices for stone, including 'Master in blocks' and 'Leigh Down Bath'.

Table listing prices for slates, including 'Best blue Bangor' and 'Best blue Portina'.

Table listing prices for tiles, including 'Plain red roofing tiles' and 'Hip and valley tiles'.

Table listing prices for wood, including 'Building Wood - Yellow' and 'Timber'.

Table listing prices for joiners' wood, including 'Sea: First yellow deals' and 'Second yellow deals'.

PRICES CURRENT (Continued). WOOD.

Table listing prices for various types of wood, including 'White Sea and Petersburg' and 'Pitch pine'.

Table listing prices for joists and girders, including 'Rolled Steel Joists' and 'Compound Girders'.

Table listing prices for metals, including 'Iron' and 'Sheet Iron'.

Table listing prices for lead, zinc, and copper, including 'Lead-Sheet' and 'Zinc-Sheet'.

Table listing prices for English sheet glass in crates, including '15 oz. thirds' and '24 oz. thirds'.

Table listing prices for oils, including 'Raw Linseed Oil' and 'Blowpipe'.

Table listing prices for raw linseed oil in pipes and barrels, including 'Raw Linseed Oil in pipes'.

PRICES CURRENT (Continued). VARNISHES, &c.

Table listing prices for various types of varnishes, including 'Fine Elastic Copal Varnish' and 'Best Elastic Copal Varnish'.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications.

TENDERS.

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

DOVER.—For additions to boiler-house, &c., drainage works, Strand-lane, for the Town Council. Mr. H. E. Stilgoe, C.E., Town Hall, Dover:— W. H. Stokes, £714 19 1; M. Warrington, £593 4 0; W. H. Grigg, £79 0 0; Austen & Lewis, £59 3 0; D. & G. Rider, £60 10 3; Geo. Munro, Brisley & Co., £64 1 3; Dover*, £59 0 0.

EXETER.—For the formation of cricket ground, including draining, road works, fencing, &c. Messrs. Ellis, Son, & Bowden, surveyors, Exeter. Quantities by surveyors:— A. N. Coles, £7,916 1; Grounds & Newton, £5,627; R. H. B. Neal, £6,999; Laphorn & Co., £5,549; Fomery, £6,788; G. Senter, £5,328; S. Saunders, £5,320; E. Judge, £4,923; W. Gibson, £5,760; E. Harris, Clysthidon, Wakeham Bros., £5,732; Exeter*, £4,600 1.

HARROGATE.—For private street improvements. Mr. F. Bagshaw, Borough Engineer:— Park-avenue. B. Oxley, Stonefall Farm, Starbeck, Harrogate, £1,404 4 0. Back Road off Union-street. R. W. Barker, Church-square, Harrogate, £64 8 10.

HARROGATE.—For stables and cottage on the Corporation Farm. Mr. F. Bagshaw, Borough Engineer:— Masonry, &c.—Barker Bros., Harrogate, £977 10 0. Joinery.—G. H. Carrick, Church-square, Harrogate, £350 0 0. Plastering.—J. Tyson, Tower-street, Harrogate, £54 10 0. Plumbing.—C. Allen, Harrogate, £95 0 0. Slating.—Baynes & Son, Harrogate, £147 13 0.

HARROGATE.—For widening Bower-road. Mr. F. Bagshaw, Borough Engineer:— James Frost, £798 8 5.

HARROW.—For the erection of a house at Kenton-road, for Mrs. Enderby. Messrs. Clarke & Charles, architects, Peterborough-road, Harrow:— F. T. Chinchett, £2,140 1; E. J. Bailey, £1,900; R. G. & Co., £1,100; Webster & Cannon, £1,500; J. S. Kimberley, £2,015; C. Simmons, Willesden, £1,987; Thomas Turner, Ltd., £1,987.

HARROW.—For the erection of a house at Lyon-road, for Mr. H. R. Matthews. Messrs. Clarke & Charles, architects, Peterborough-road, Harrow:— G. & J. Waterman, £3,884 1; J. S. Kimberley, £3,780; R. G. & Co., £3,805; T. Turner, Ltd., £3,570.

[See also next page.]

HORLEY (Surrey).—For alterations to the Chequers Hotel, Horley, for Mr. A. Brandt. Mr. E. Blundell, architect:— Thomas Wickens £1,530

HORNCHURCH (Essex).—For the erection of bungalow-residence, Parkstone-avenue, on the Emerson Park Estate, Hornchurch, Essex, for Mr. Laurence B. Wilson. Mr. D. Taylor, architect and surveyor, Station-avenue, Winchmore Hill, N.:— J. R. Jackson £750 Wm. Goddard, junr., New Southgate £775 [Surveyor's estimate, £717 11s.]

KINSON (Dorset).—For the erection of schools and additions, Kinson Heath, for the School Board. Mr. Walter Andrew, architect, Alton Office, Parkstone. Quantities by Messrs. Jennings & Goater, Bournemouth:— Jones & Leward £3,067 0 0 J. Challis £2,710 5 9 Jenkins & Son 4,983 0 0 Baker & Whitaker 2,938 0 0 Pearcey 2,670 7 9 A. & F. Wilson 2,913 2 2 T. C. Rigler 2,592 16 2 G. Crab 2,733 14 0 H. C. Smith 2,855 7 0 W. J. Cross 2,730 18 2 Bournemouth 2,278 10 0

LITHERLAND (Lancs).—For sewer and roadmaking, Field-lane, for the Urban District Council. Mr. W. B. Garton, C.E., 25, Sefton-road, Litherland:— W. F. Chadwick £3,559 11 1 Thomas Rowlands 3,114 4 0 Joseph Joyson, Walton, Liverpool 2,855 7 0 Peter Lyson 2,849 6 2

LLANDILO.—For building a church at Maestello (exclusive of foundations), for the Misses Mansels and the Building Committee. Mr. David Jenkins, architect:— Thomas Brothers £1,815

LONDON.—For artisans' dwellings, Phoenix-street, St. Pancras, N.W., for the directors of Hampden House, Limited. Messrs. Salter, Issett, & Salter, architects, Phoenix-street, N.W. Quantities by Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W.:— Marchant & Hirst £2,439 Patman & Fothergill £2,180 Vears & Co. 2,359 Ingham 2,138 W. Walls 2,375 T. E. Mitchell 2,138 W. S. Beaton 2,390 T. G. Sharpington 2,129 Wilkinson Bros. 2,215 Brown & Son, Wellington 2,100

LONDON.—For electric light wiring and fittings for the Fulham Parish Receiving School, 9, Parsons-green, S.W., for the Guardians of Fulham Parish. Mr. A. Saxton Snell, architect. Quantities by Messrs. Dolby & Williamson, consulting engineers:—

Table with columns: In Simplex Tubing, In Wood Casing. Lists various contractors and their costs for electrical work.

C. B. N. SNEWIN MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGDON ROAD, E.C.

ORSETT (Essex).—For the reconstruction of drainage at Orsett Union, for the Guardians of the Poor. Mr. Christopher M. Shiner, architect, 3, Bond-court, E.C.:— Cooke £105 2 9

WALTHAMSTOW.—For the erection of a villa residence at Walthamstow for Mr. W. Bach. Mr. F. T. Hill, architect, Walthamstow:— Barton £1,241 Carter £1,100 Goodhall 1,198 Reed, Walthamstow 1,095 Rawlins 1,190

WALTON-ON-NAZE.—For main sewerage and sewage disposal work for the Walton Urban District Council. Messrs. Beesley, Sott, & Nichols, engineers, 11, Victoria-street, Westminster:— G. Double £14,763 5 0 Cooke & Co. 10,329 0 0 J. W. Ransome 12,980 0 0 Burgoyne 10,130 0 0 Johnson & Sons 9,614 8 6 Co. 12,700 0 0 Mackenzie & Sons 9,410 0 0 Bros. 12,200 0 0 E. West 9,300 0 0 C. J. Ford 11,931 0 0 Parry & Co. 9,270 0 0 G. Bell 11,090 0 0 J. Moran & J. Jackson 10,770 0 0 Son, Harwich 8,950 0 0 Wilkinsons Bros. 10,720 0 0

WOOLSTON (Southampton).—For new Liberal Club, Victoria-road, Woolston. Mr. John H. Bilzard, architect (Lemon & Bilzard):— Bagslaw & Son £15,587 Hinton Bros., F. Chalk 15,540 Woolston £12,250 C. Daysh 14,339

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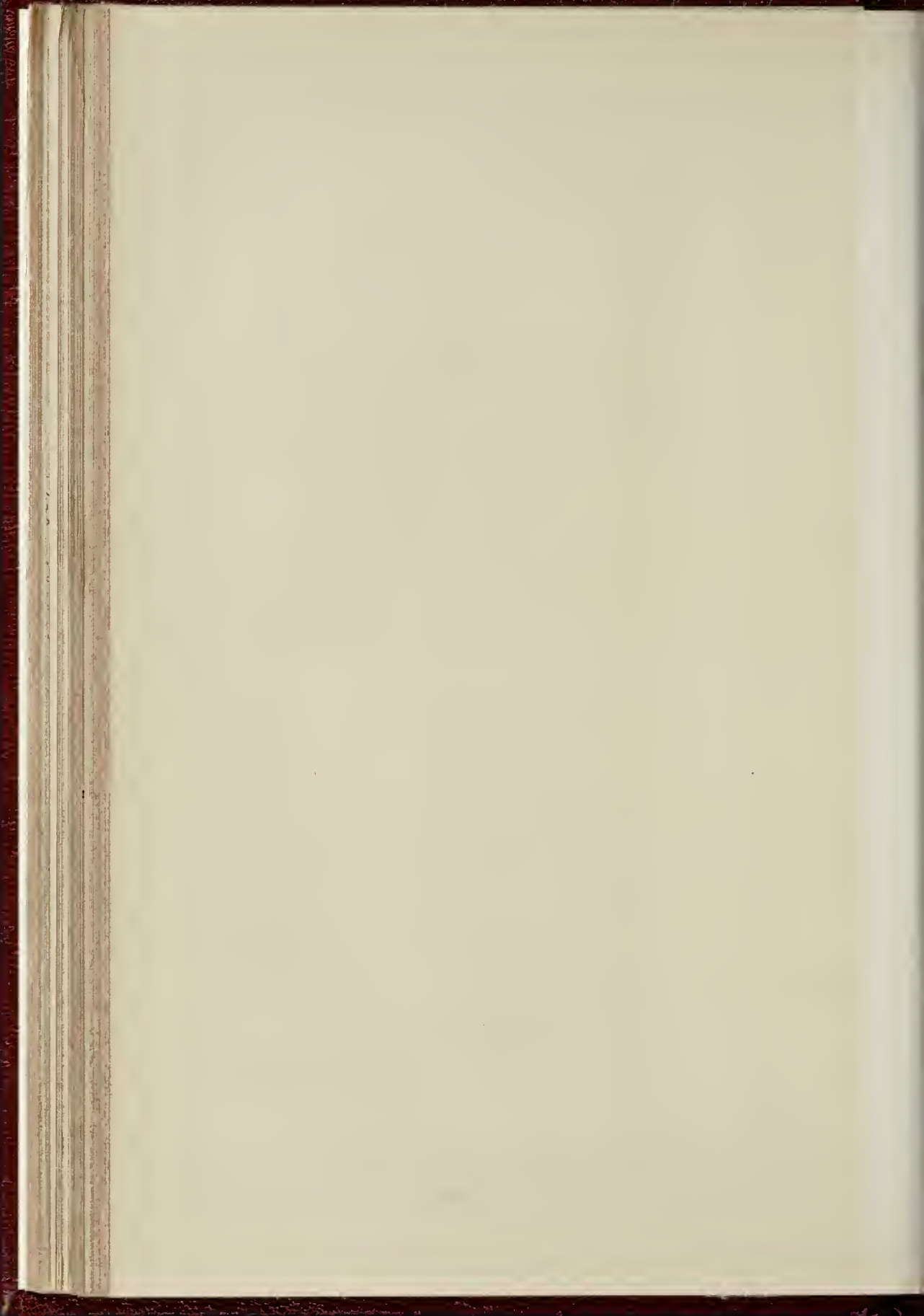


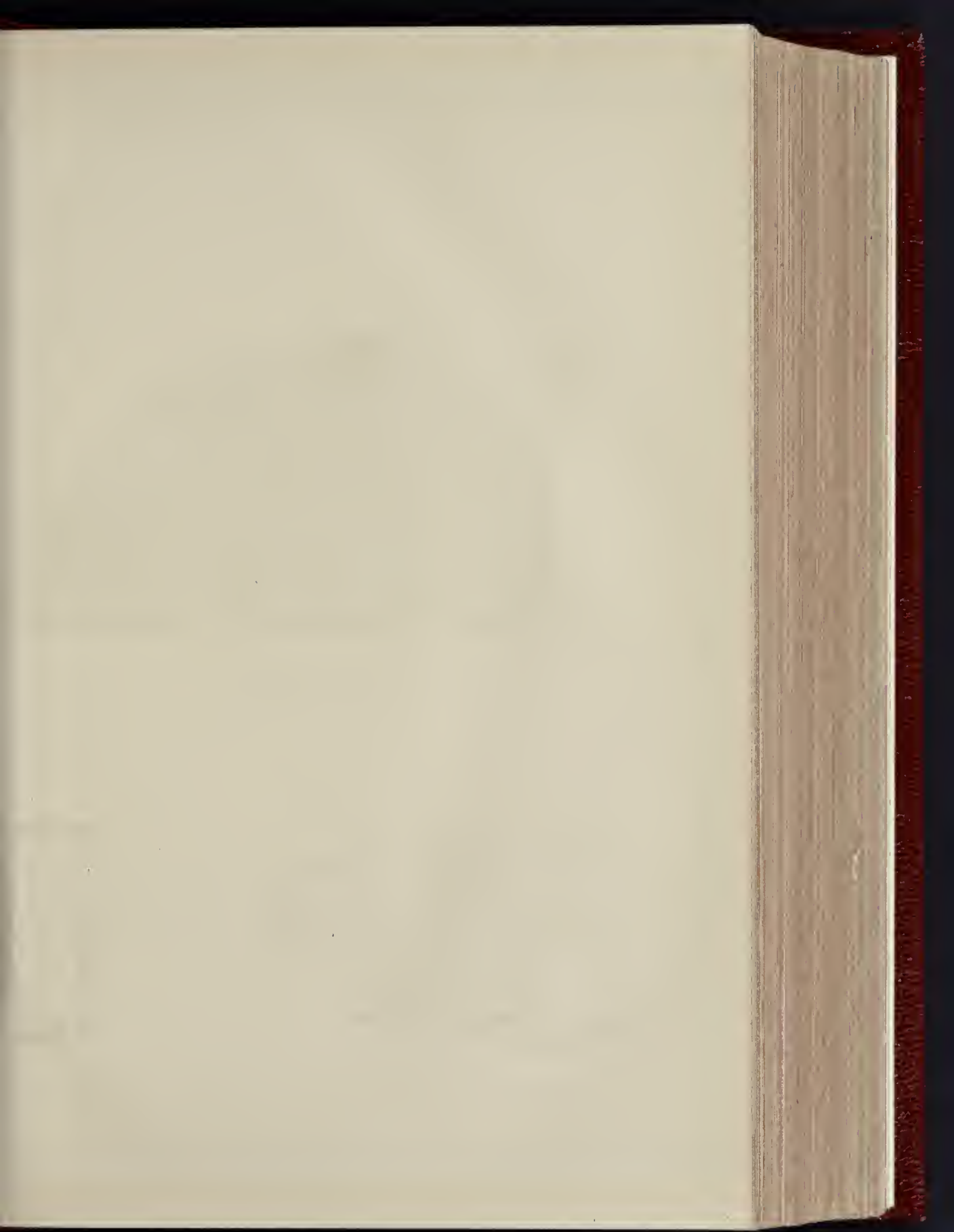
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MACPIE & STUMP HOUSE : EXG
37 CHEYNE WALK . CHELSEA .

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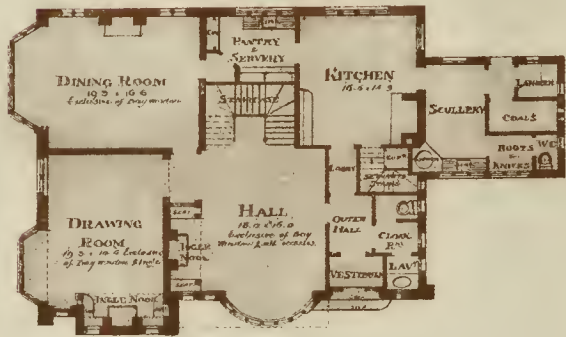
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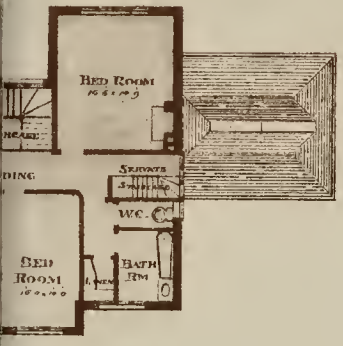
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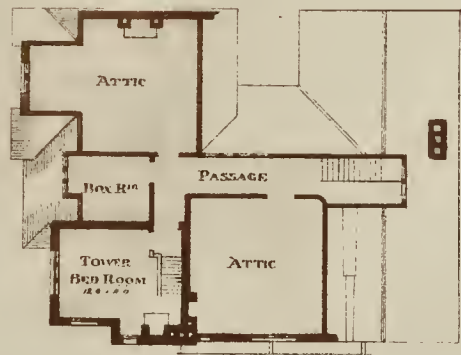
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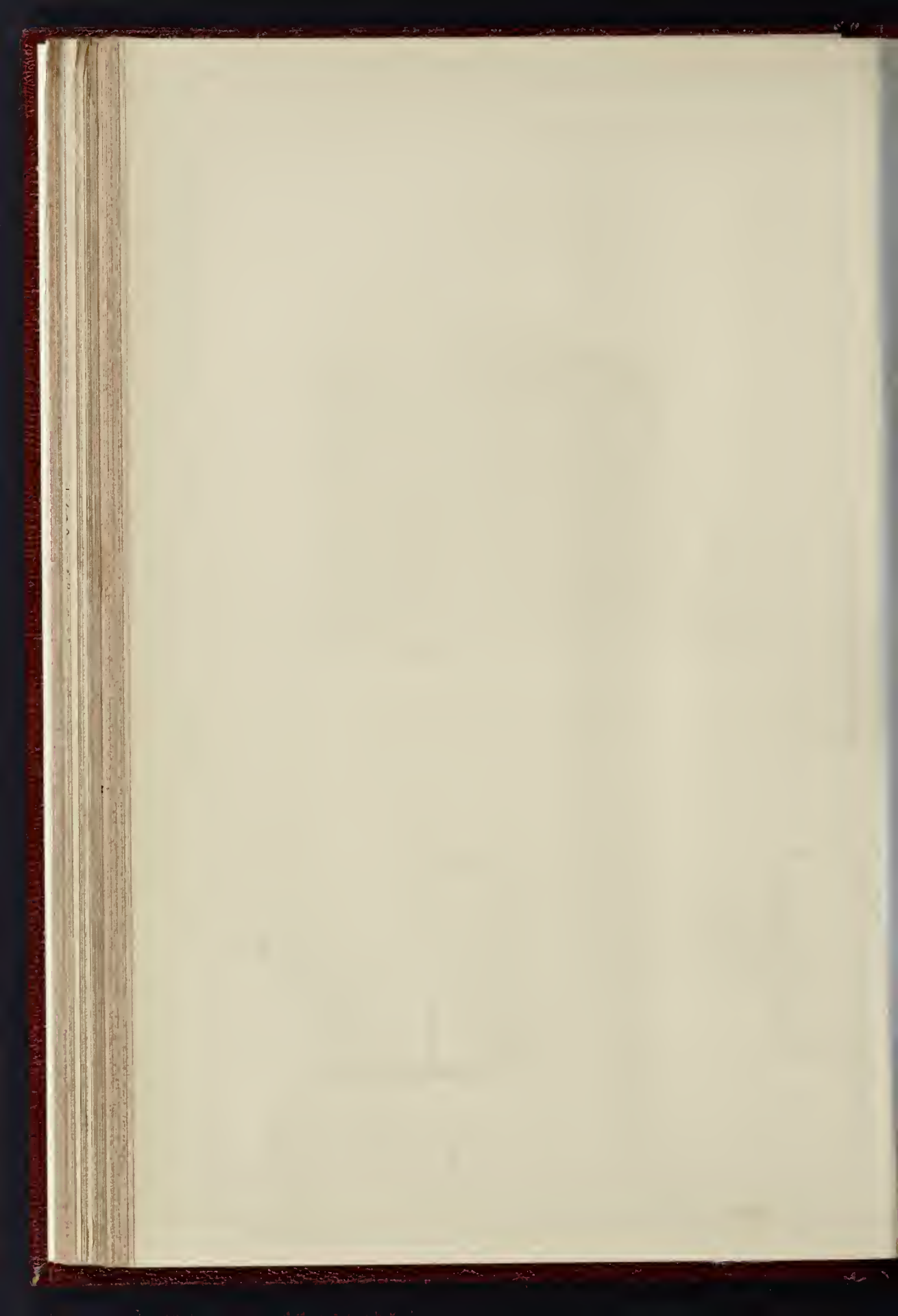


— FLOOR PLAN —



— ATTIC FLOOR PLAN —

*Chas. C. Sprague
25 North 1st Street
Boston, Mass.*



The Builder.

VOL. LXXX.—No. 3025.

JANUARY 26, 1903

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 House at Vienna (Professor Deininger); House at Vienna (Professor Wagner) *Double Page Ink-Photo.*
 Plans *Two Double Page Photo-Lithos.*

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In Loyal Memory.

THE death of a sovereign who has reigned so long, and been so justly beloved and honoured as our late Queen, is one of those events before which men of all professions must feel bound for the moment to forget the limits of professional interest, in view of those wider interests which unite us all as Englishmen and as fellow-subjects of the English monarchy. Architect, engineer, artist, archaeologist, and artisan—the classes of readers for whom we especially write, must all feel this week the sense of a common regret which appeals to our common humanity. For it is no ordinary reign which has this week been brought to a close. It has been a reign remarkable for its length; for the general prosperity which the country has enjoyed; for many great and important reforms in polity and advances in science and in social well-being which it has witnessed; and more especially for the high character of the sovereign who has occupied the throne for so many years. Even to that great majority of English men and women who have never had any direct acquaintance with the Queen, her loss must be felt almost as a personal one. To all but the oldest among us her name has been a life-long association; "The Queen" has been a word and of living symbol of the nation;

her name the universally honoured toast on all occasions of festive gathering; the unfamiliar title "The King," which for the last two or three days we have read in the newspapers and on posters, and around which in time the same loyal associations will cluster, seems for the moment almost startling, and as if it belonged to some other country than our own. And throughout this long reign the Queen has merited and obtained the unfeigned and unflinching respect of all her subjects; she has maintained a high standard of social life in her Court; and it must be a melancholy gratification to all English people to notice how universal is the note of respect and admiration for her in foreign countries, even in those which apparently have no very kindly feeling towards us as a nation.

We have no authority for supposing that the Queen took any special interest in art, but it is probable that few sovereigns who ever reigned have taken a deeper and truer interest in the welfare of their country generally; we believe that Ministers who had to see her constantly on political subjects could say much more on this head than is commonly imagined. An idea which some of her perfectly loyal subjects have had, that the Queen, though an excellent lady, was not intellectually gifted, is, we believe, quite a misapprehension. Her two books, it is true, though pleasantly written and interesting, can hardly be said to have evinced literary genius; but that is, after all, only one kind of talent; and we have heard of eminent men of letters, whose position brought them from time to time into the

Queen's society, and who had conversed with her a good deal, speak with high appreciation of her talent in conversation, the extent and variety of her information, and the keen and enlightened interest she took in all that was passing in the world.

But it is in a moral and political aspect that the Queen's memory will remain most especially honoured by posterity. Called by hereditary succession to the highest office in the realm, she took her place in it with an even greater sense of the responsibilities than of the honours of the position; and throughout a reign—fortunately for the country—of very unusual length, she has left no memory behind her of any act or any influence, political or social, which the nation could regret or which history can call in question. She was an ideal Constitutional sovereign, never attempting to interfere with the government of the country in any manner beyond the scope which the English Constitution allows to the sovereign, but always maintaining an influence on public affairs, felt and acknowledged, we believe, by all statesmen who served under her. And her interest in the social well-being of her people could never be doubted, and has been evidenced over and over again by her public expressions of sympathy and sorrow in any case of misfortune or calamity. In her great position she has maintained a uniformly high standard of public duty and private character; and in this respect all the subjects who mourn her loss, from the highest to the lowest, may endeavour to emulate her example.

THE LAW OF LIGHT.

THE Joint Committee of the Royal Institute of British Architects and of the Surveyors' Institution is to be congratulated on having so speedily come to a decision. Its Report will be found in another column, and, constituted as the Committee was, this document must necessarily command respect and attention. Yet we fear it will be read with some disappointment. As we pointed out in our article* on the subject, after the appointment of the Committee, it is impossible to abolish altogether—as many would wish—the right to light. So clear is this that the Committee do not even discuss the possibility or desirability of such a legal change. It was probably regarded as too academic, but seeing how strong a feeling there is on the part of many competent professional men on the point, it would have been more satisfactory to have received from the Committee a definite pronouncement upon it.

The Report starts by a recommendation on a singularly minor point—namely, the right to an extraordinary amount of light, or, as it would be more properly expressed, the right to light necessary for a special or extraordinary purpose. As many of our readers are aware, this very point has lately been much before the Courts, and the tendency of recent judgments has been towards its limitation. That legislation in this direction is desirable there can be no doubt, but it would cover but a very small part of the subject.

It is certain, as all architects and surveyors know, that the law of light gives rise to not a little abuse; this has been summed up in the word "blackmail." We look, then, with no little interest to see how the Report proposes to keep the law from being used for unrighteous purposes. We must confess to considerable disappointment.

The owner of the dominant tenement who considers that his ancient light is likely to be interfered with is to have the right to inspect the drawings of the servient tenement, or if none exist to be informed of the intentions of his opponent. If his apprehension is justified he is to serve a notice on the owner of the servient tenement. For the several steps we refer our readers more particularly to the fifth and succeeding paragraphs of the Report. But it seems clear that it is not intended by the proposed Act to prevent the owner of the dominant tenement from proceeding in a court of law if he so desires. If this is so then all the old abuses will be left. In the article to which reference has already been made, we stated it to be our opinion that the remedy by injunction should be abolished—"Abolish the remedy by injunction and the blackmail disappears." If the owner of the dominant tenement can oblige the owner of the servient tenement to demolish his building, so long will blackmail continue. Limit the remedy to damages, and a just recompense for any loss of light will be obtained. Why, as we have already said, is the owner of a right to light to be placed in such unusually favourable conditions? If a railway company takes half the garden of the finest mansion in England, and mars it as a place of residence, damages only can be recovered.

Thus, when the Report comes to be considered, it will be found to do little more as regards existing rights than suggest an alternative remedy, which, we must confess, looks as though it would be remarkably costly, and will certainly lead the public to think that the suggested legislation will tend largely to bring grist to the mill of architects and surveyors, for it introduces the surveyor at every turn either as adviser or arbitrator. And there is this to be said—a reasonable owner can now put the matter in the hands of his surveyor to adjust the differences in a friendly and businesslike manner. Is it likely the unreasonable owner will go to the tribunal which is proposed?

Leaving this point, we come to two others: One is that the owner of the servient tenement may prevent the growth of the right to light by serving a notice—we presume to the effect that no right is to be gained—on the owner of the dominant tenement (see paragraph 2 of the Report). This is certainly better than the barbarous practice of erecting boardings or other obstructions; on the other hand, as the right to light comes from the enjoyment of it, it may seem to the public that the only practical way to prevent it is by stopping its actual enjoyment. In working any fresh regulation considerable care will be required. According to the Report, the notice shall be served on the owner, but there are others than owners interested in these matters. The main point to bear in mind is that any such notice must, if possible, be one which comes, or is capable without difficulty of coming, to the knowledge of any person having an interest in the dominant tenement. There then comes the recommendation that a building erected after January 1, 1905, shall not acquire fresh rights to light when it abuts on a street or highway. It is not easy to see the reasoning which prompts this suggestion, because these rights to light are such as relate to the properties dominant and servient of private persons. The question of the light in public thoroughfares is a matter to be regulated by the Building Acts. Why is the owner of a dominant tenement not to acquire a right to light for apertures which look on to an alley, and yet to obtain it in respect of those which open on to a back yard or garden? This recommendation we regard as impracticable—at any rate in its present form. Moreover, the right in this case seems to be for the public interest, and to diminish it would tend to darken streets and highways. We should have been glad had the Committee based their recommendation on reasons stated in the Report, which would have been stronger had it given the public the preliminary reasoning which we are accustomed to find in Government reports. It would also have been of interest to have known the materials in the shape of evidence and recommendations on which the Report is based. In other words, is it the opinion only of those who form the Committee, or is it the result of the statement of the opinion of competent persons, either architects, surveyors, or lawyers? If it is only the former, the Report will have merely a kind of individual authority; if, on the other hand, it is based on a consensus of general professional opinion, legislation will be much easier and more probable.

The first two recommendations, if en-

trusted to a competent draughtsman, and pressed on the attention of the Government, may become law, but we are not sanguine, and something must necessarily depend on the manner in which the Report is received by the profession. After stating that "the law and practice of ancient lights is exceedingly unsatisfactory," one would have expected that the Committee would have given the public a Report of a somewhat more seasoned and more far-reaching nature.

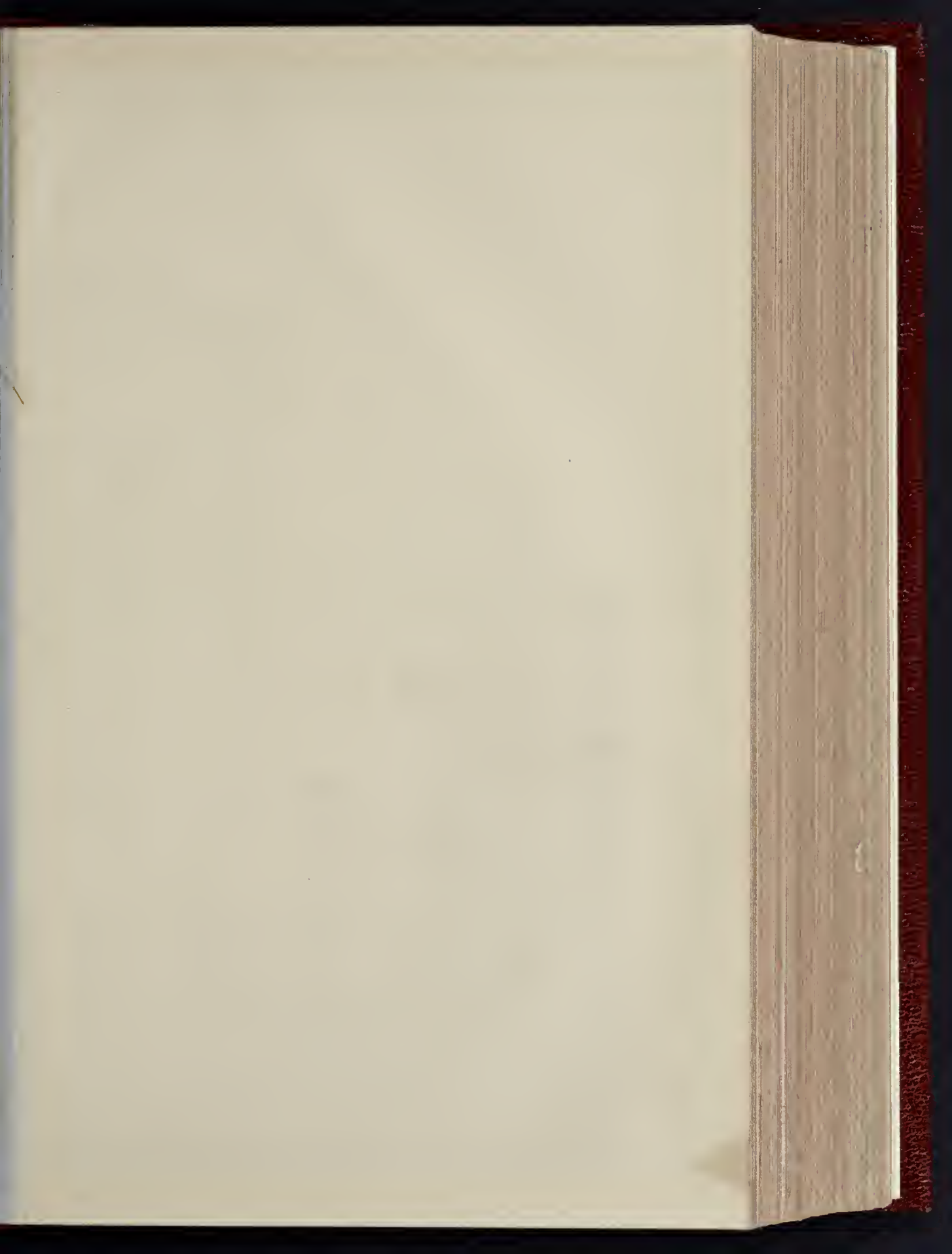
THE NEW RAID OF THE WATER COMPANIES.

THAT the inhabitants of the greatest city in the world should at this time of day be dependent for an absolute necessary of life on the health upon private companies who are working and selling water in the interest of their shareholders only, is something monstrous that it is astonishing that there has not, long ago, been a public appeal to the Government to put an end to it. And connected with this central anomaly is the minor but most vexatious annoyance arising from the petty tyranny which the water company has power to inflict upon householders, especially those of the poorer class by domiciliary visitations and by arbitrary requirements to renew this and that fitting, often with no reason except that it does not tally with a doctrinaire notion of the company's in favour of some special form of fitting; with the option of having the water cut off unless the order is obeyed. That any Government should ever have given such a power as this to private companies is something which with our present lights, seems almost incredible. For just imagine what cutting off water from a household really means; depriving people of a necessary element of ordinary sanitary living, a state of things the ill effects of which may extend beyond the household immediately concerned, by setting up an insanitary centre; and consider that this is to be done because a household declines to comply with a possibly perfectly arbitrary and unnecessary demand of the company.

The water companies, however, are apparently not even satisfied with their existing powers of household interference and tyranny; and while they are at present probably, the most unpopular bodies in existence, and while their suppression is, we trust, not many years to be delayed, they are demanding new and more extended powers of interference to enable them further to trample on the unfortunate consumer who is compelled to be their client, because they have acquired a monopoly in a necessary of life. As a piece of policy, it seems, it must be owned, singularly ill-timed even in the interests of the water companies, that while every sensible person is crying out for an end to be put to their rule, they are deliberately taking steps to make themselves still more obnoxious, and to impose still heavier burdens on the unfortunate consumer.

These new demands are to be discussed at a Conference of the representatives of the City Corporation, the City of Westminster and the Councils of the Metropolitan Boroughs, called for Friday afternoon this week. It is to be hoped that a strong line will be taken by the meeting in regard

* See *Builder*, June 2, 1900.





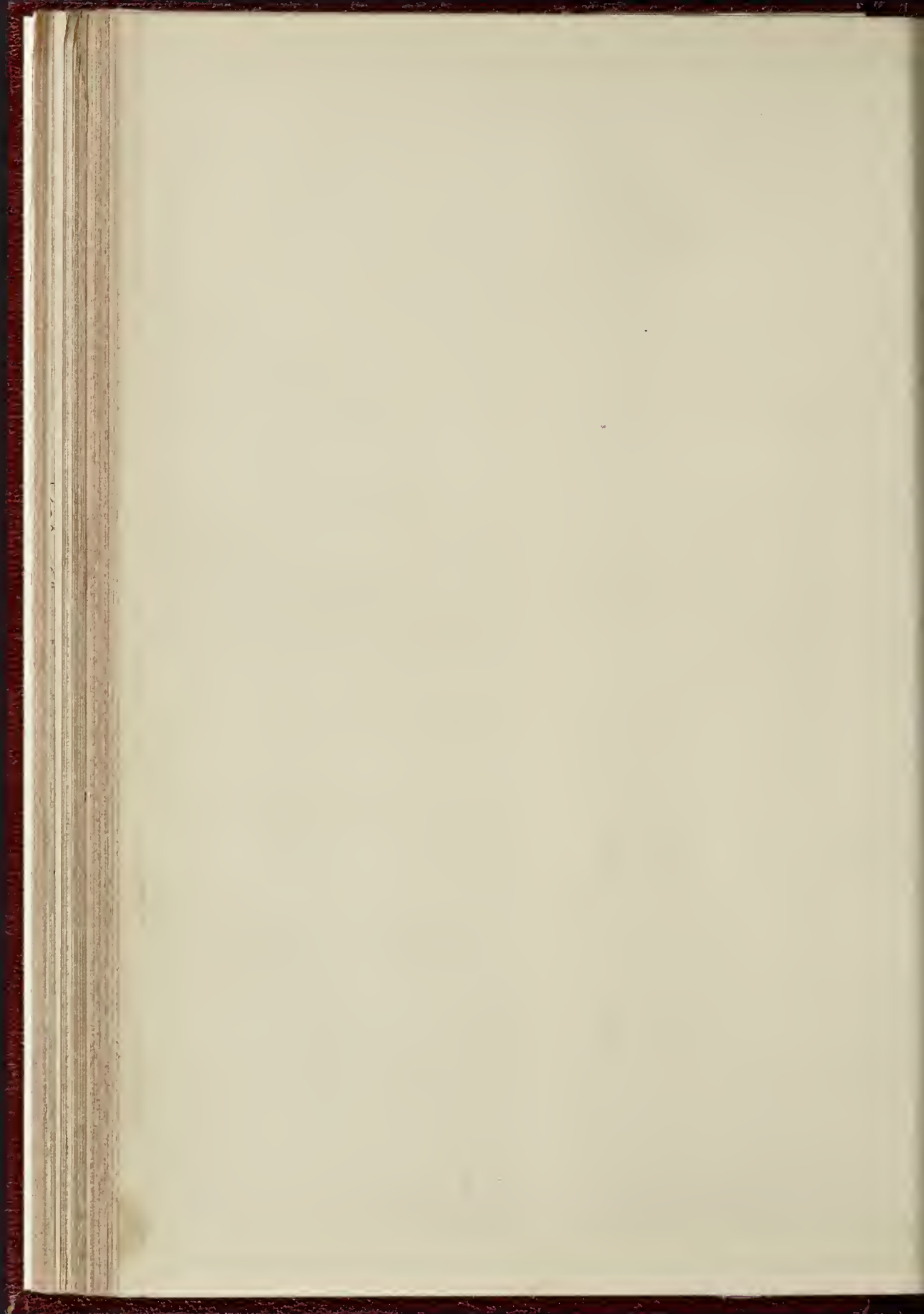
DER ROMAHOFF, VIENNA (PROFESSOR JULIUS DEHN)



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APARTMENT HOUSES

CORNER HOUSE, STEFANSPLATZ, VIENNA (MESSRS. FELLNER & HELMER).



to these new demands, and that resolutions will be passed such as will at least tend to prevent their ultimate adoption.

The new clauses have been printed, in view of the intended meeting, with an opposite column of criticisms or suggestions which have been already made by various Borough Councils, or by the "Conference of Borough Councils South of the Thames" (indicated by the letters B.C.S.T.). The first objectionable clause we come to is in the second paragraph, under the heading "Definition of Communication Pipe." By the alteration of one word, the substitution of "ball" for "stop," the ground is cleared for a new raid into the consumer's house. The communication pipe was formerly defined as "the pipe which extends from the district pipe, or other supply pipe of the company, up to the stop-valve;" *i.e.*, the stop-cock which is to be placed on the main near where it enters the building. It is now to read "up to the ball-valve," so that all the length of pipe within the house up to the ball-valve of the cistern is placed under the company's surveillance. The Hammersmith, Paddington, and Chelsea Councils all enter objections to this. The full object, however, of this insidious alteration is not perceived till we come to the fifth clause, which reads:—

"Defective communication pipe."

5. Any existing 'communication pipe' which is not as prescribed by these regulations, shall, when it becomes defective, or requires repair, be replaced by a lead pipe of the prescribed weight."

So that by this regulation the companies seek to have the power, on the notice of anything which they consider a defect in the rising main, to compel the tenant to re-nestate the whole length of it with new lead piping. This is strongly opposed by the Councils of Woolwich, Hammersmith, and Paddington.

The companies seek, further, to impose a pattern of their own for every fitting in the tenement. The connexion with the companies' mains is henceforth to be made not only "by a ferrule or stop-cock of a pattern approved by the company," but a long schedule is given of the required weights and dimensions of every portion of the work for four different sizes of waterway. Wandsworth Council and the B.C.S.T. comment bluntly—"delete this regulation," and with reason. But this is surpassed by the following, numbered 18, and which is entirely new:—

"Weights and dimensions of stop-valves, draw-taps, and bath apparatus."

18. Every screw-down stop-valve, draw-tap, and bath apparatus shall be fitted with loose valves (such valves shall be lifted by the spindle, and shall not be dependent upon the pressure of the water for opening), and shall be fitted for cold water with washers of oil-dressed leather, and for hot water with washers of vegetable fibre of the best quality, or other material approved by the company. The word 'inlet' shall be distinctly marked on the inlet side of the stop-valve, and such stop-valves for attachment to lead pipe shall be made with screwed ends and unions. The spindles shall in all cases be of gun metal, but all other parts may be of brass of good suitable quality. Every stop-valve, draw-tap, and bath apparatus shall be of not less than the following weights and dimensions:—

And there follows a tremendous schedule laying down the dimensions of every portion of every possible valve and tap. It is something perfectly unheard-of. Imagine the power for oppressing the consumer which would thus be put in the hands of the

officials of the companies; officials who, as many persons can testify, are even now only too ready to manufacture complaints about fittings, and to report things as defective which are not so. And is it even certain that the fittings approved by the company will be better than those they displace? We know of one instance where a householder, at the requirement of the company, sacrificed two existing ball-taps which were working well but which they declared to be of a bad pattern, and substituted two stamped with the company's seal, with the result that one of these is constantly sticking down and letting the water through. A final touch is given to these astounding demands by the provision (paragraph 15) that the company may make a charge for testing fittings; *i.e.*, fittings are to be renewed at the pleasure of the company and at the cost of the householder, and the householder is to pay the company for testing them, such test being made solely in the interests of the company and its shareholders! The force of impudence could not go further.

A further trap is prepared for the consumer in paragraph 42, relating to "existing fittings," which states that "when any such fittings become defective and cannot be sufficiently repaired, they shall be replaced with fittings prescribed by these regulations." Those who have had any experience of the ways of water companies' officials will have no doubt how readily all their existing fittings will be "found to be defective."

There are two more points of perhaps more importance than any others, to be considered in connexion with these proposed regulations. One is that relating to cisterns, which is entirely new, and runs as follows:—

"Cold-water storage cisterns."

19. Every house (or in case of flats each suite of rooms) supplied by the company shall, except with the consent of the company in writing, under the hand of their secretary, be provided with a cold water storage cistern or cisterns of sufficient capacity to contain in the aggregate at least twenty-five gallons of water for each room. Each outlet-pipe from such cistern or cisterns shall be carried up inside one inch above the bottom of the cistern, and such outlet-pipe shall be commanded by an efficient screw-down stop-valve, placed in a readily accessible position, within one foot of such cistern, and a draw-off tap from same shall be provided. In no case may there be any connexion between the draw-off pipe from the cistern and the supply or communication-pipe."

This demand for large storage cisterns is directly contrary to all sanitary opinion of recent years. It is exactly because large cisterns are a sanitary evil that constant service has been recommended and has been to some extent enforced on the water companies. Now they come forward and demand the very thing which constant service was to render unnecessary. And what is the object of this demand for large storage systems? Obviously it is to enable the companies to break or withdraw constant service whenever it is convenient to them, without the consumers finding it out. We are glad to see that this proposal has met with specially strong opposition from several of the District Councils, especially those of Woolwich, Hammersmith, and Shoreditch.

Another point in the proposals gives an opportunity, which we hope will be taken advantage of, to re-open the question as to the amount of flush to water-closets. Paragraph 34 of the proposed regulations repeats

the existing regulation, with some modification in the wording, which forbids a larger flush than two gallons. How the companies ever obtained the permission to adopt this regulation, in face of the unanimous opinion of all the sanitary expert witnesses that it was not sufficient—what authority was "got at" on the occasion—is one of those mysteries which we shall probably never know the solution of. But we observe, in connexion with this point, that the Councils of Wandsworth, Woolwich, Chelsea, Hammersmith, and Paddington, as well as the "B.C.S.T.," all concur in expressing the opinion that a two-gallon flush is insufficient. It is to be hoped that they will have the courage of their opinions, and will take this opportunity to get this insanitary regulation quashed. In that case some good will have been done by these "proposals," and we shall have the additional satisfaction of seeing "the (water) engineer hoist with his own petard."

In conclusion, we may say that all householders and consumers in the London water district ought to combine to resist the adoption of these proposed regulations, which will put in the hands of the water companies a power of oppressing the consumers, and causing irritation and unnecessary expense to them, far beyond even that which they possess already. It really seems as if in putting forth such proposals, the water companies had been anxious, out of sheer bravado, to show themselves in the worst light, and intensify the feeling of dissatisfaction—or something much stronger—which already exists against them.

NOTES.

We have received one or two letters from Soane Medallion competitors complaining of what they consider the harsh proceeding of the Council of the Institute in withholding the prize this year, when there were so many competitors. But we consider the Institute were perfectly justified in their action. It is not quantity but quality that counts in such a competition; and there was no design sent in which came up to the standard which might be attained, and which has been attained in Soane competition designs in former years. The best way to raise the competition to its former high standard is to show that the medal is not to be easily won, and to withhold it when no design comes up to the desired standard. In awarding a money prize to those who were considered the three best competitors, the Council were probably influenced by the desire not only to give the competitors something for their trouble, but also to afford a practical proof that the withholding of the prize was not influenced by any economical considerations. At the same time we do not think the selection of the three designs by "Ars," "Hiawatha," and "Ionic" *ex æquo* was quite justified. The two first were rewarded for merits of plan and design, the last for fine drawing; for apart from the drawing "Ionic's" design presented only rather commonplace features, while the plan was exceedingly defective. Drawing counts for something, but it should not be put on a level with plan and design. In the award of the Tite Prize we think a mistake has been made; the first and

The Institute Prizes.

second prizes should have been reversed. The design to which the second prize has been awarded, while quite within the lines of Tite's bequest, shows real originality, while the other does not.

THE case of *Roe v. the Aërated Bread Company, Limited*, which was recently decided by Judge Edge, and is reported in the *Land Agents Record* of January 19, is a useful decision. It has not, of course, any value as a precedent, except in so far as other judges may regard it as stating the law with accuracy. The question was a very simple one. A party-wall had in it an old crack, but for the purposes of a party-wall under existing circumstances it was a good wall. The company, however, required to enlarge their premises, and when this was done the wall would require to be rebuilt, and it was contended by them that the appellant should pay a part of the cost of rebuilding the wall because it was "defective or out of repair" within the meaning of Section 95, Sub-Section 2, of the Building Act, 1894. The judge held, however, that this contention was wrong, and that the Legislature did not intend that there should be a joint bearing of expense except when a party-wall must be rebuilt in order to enable it to perform its existing functions. This is obviously common sense; otherwise one owner might have to pay a large sum of money not for an operation which was for the joint benefit of himself and the other owner, but solely for the benefit of a man who wished to enlarge his premises.

It is certainly very surprising to find the India Office, at a time when on all hands it is admitted that one great need of the country is technical education, take a step which seems to be adverse to it. Cooper's Hill College is admittedly a successful engineering school, and it is self-supporting. To the ordinary man it would seem to be desirable not only to leave things as they are there, but if possible to enlarge the operations. But the Government, as many of our readers are probably aware, has given notice to several of the professors to leave at Easter, and is bent on limiting rather than enlarging the scope of the College. So far as it is possible to judge from the materials before the public, there is absolutely no ground whatever for this action on the part of the Secretary of State for India. Unless this action can be justified, it will be the duty of Parliament to prevent this blow to technical education. If it does not, it will be obvious that it is useless to hope that this country will not fall behind its rivals in many forms of science and technical knowledge. In Cooper's Hill there exists an institution which may become the nucleus for a much larger scheme of technical education.

THE paper read to the Institution of Electrical Engineers last week by Mr. Mordey described some of the difficulties which will have to be overcome by electrical engineers before they can distribute power economically over wide areas. One of them is the charging current which the concentric mains take even at no load. The inner and outer concentric conductors act like the two coatings of a Leyden jar to one another, and since

with alternating currents the pressures are always altering in magnitude and sign at a rate proportional to the frequency of the alternating current, we get a large current flowing in and out of the mains due to this action. Now, it has hitherto been considered that this condenser current requires little power to drive it, but Mr. Mordey found that a cable five miles long required about two horse-power to keep it charged at 2,000 volts. At 20,000 volts, the pressure at which it is proposed to work some of the new large central power stations, the loss would be one hundred times as great—that is, 200 horse-power. Now this loss would always be going on, night and day, and so would be a very serious item in the year's expenditure. In the discussion Professor Ayrton questioned the accuracy of the meter with which Mr. Mordey made his measurements. In our opinion, however, the meter read correctly, but the cables experimented on were not the most suitable that could have been got. In alternating current work it is essential not only to use a material between the two conductors which is a good insulator, but it must also have a small dielectric constant. Mr. Mordey's paper is a most timely one, as it is for the good of the industry that the difficulties which electricians will experience in distributing energy from the new central power stations be thoroughly discussed beforehand. It is to be hoped that there will be no repetition of the rash and expensive experimenting which marked the opening of the Deptford station.

THE War Office authorities have arranged to take over the prison buildings in the Castle, which are no longer needed for civil purposes, and to convert them for purposes of a military prison for the North-Eastern and North-Western Districts, with room for 155 prisoners in lieu of the civil prison buildings at Kendal which they have lately returned to the Prison Commissioners. Within the present and enlarged area of the Castle precincts, covering four acres and surrounded in 1836 with a wall 35 ft. high, stands the male debtors' prison erected in 1701-8; opposite the County Assize Courts, built in 1765-77 upon the site of the old Assize Hall (1673), stands the female debtors' prison, 1780—the two buildings having been planned and designed by John Carr, and enlarged in 1803 by T. Atkinson the elder. At the north-east angle are the Governor's house, 1833, and the county prison for felons, consisting of the four blocks and the massive towered gateway, erected in 1826-30 after P. F. Robinson's plans and designs. The alterations cost, in all, a sum of about 225,000*l.* York Castle stands in the south portion of the city, just within the confluence of the rivers Ouse and Foss, at the east end of Castle Gate. There are portions of, it may be, early twelfth-century work in the wall of the lower ward, overlooking the Foss, but the round towers are of a time not earlier than that of Henry III. On a high artificial mound within the later enceinte is Clifford's Tower, built early in the thirteenth century on a plan of four engaged drums whose walls are from 9 ft. to 10 ft. thick; the court within, in which is the well, has longer and shorter diameters of 64 ft. and 45 ft. respectively. The drums meet one another in the shape of a quatre-foil; they rise to a height of

40 ft. Above the first floor are hanging turrets or closets that project at three of the angles of intersection. At the fourth angle is a projecting rectangular bay, of which the lower stage forms the entrance and the upper stage a small bed-chamber or chapel, which is arcaded and ornamented with dog-tooth moulding. Two rounded staircases give access to the top. (Confer also Edward King's account, with drawings and plans, in "Archæologia," Vol. vi., 1782.) The Castle and tower were at one time strongly defended with a deep moat crossed by drawbridges, and being vested in the Crown, served during a long period as the High Sheriff's official residence and stronghold. Clifford's Tower, after its damage by a fire in 1684, and some other buildings were taken for the county gaol. In 1836 was built the wall, about 3,300 ft. in circuit, that included the later buildings within the Castle precincts, and at the demolition of the city gaol in 1878 the Castle became the city and county prison.

THERE has been some discussion recently as to a proposal to restore Haddington parish church, and Lord Wemyss contributed to the *Times* last week a letter on the subject which is certainly rather amusing, without being intended to be so. It appears that the minister of Haddington, in appealing for funds for the restoration, referred to the example set by Lord Wemyss, who had restored the stone tracery of one of the windows of the ruined transept. But Lord Wemyss is indignant at being thus accused of restoration. He says—"It was not with a view to the restoration of the ruined portion of our abbey church that I did this, but to embellish and perfect the ruin." This is certainly one of the most original distinctions we ever heard of. Most restorations of ruined buildings are made with the intent "to embellish and perfect the ruin;" that is just where the mistake lies. Ruins that are "embellished and perfected" cease to be ruins. Lord Wemyss seems to have imagined that the ruined part of the church would be improved by the addition of modern imitation Gothic tracery; but when other persons, not unnaturally, quote his example and wish to carry the same principle further, he is shocked, and rebukes them.

MR. E. WAKE COOK, writing in the *Times*, blames the Royal Academy for omitting, in their show of paintings by artists deceased during the last fifty years, to give any example of the works of John Martin. It is perfectly true, as Mr. Cook says, that Martin had a great power of representing vast architectural perspectives, and had he confined himself to such architectural compositions he would have had a *locus standi* as an eminent artist in that class of work. But these architectural compositions were merely the scenic setting for Apocalyptic scenes which were puerile in conception, violent in colour, and full of badly-drawn figures. If his "Last Judgment" with its millinery angels blowing trumpets, or the "Plains of Heaven," with the figures fluttering in gauze drapery and the gilded barges on the celestial lake, were brought out again now, they would only excite ridicule. Martin appealed to the artistically

Lord Wemyss on Restoration.

Cooper's Hill College.

Alternating Electric Currents.

Martin's Pictures.

educated section of the religious public, and had his reward in his day. His reputation is out of date now.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

DIFFICULTIES AND HINDRANCES IN PRODUCING GOOD MODERN ARCHITECTURE.

An ordinary general meeting of this Institute was held at No. 9, Conduit-street, Regent-street, W., on Monday evening, the President, Mr. William Emerson, occupying the chair.

Mr. Alexander Graham, hon. sec., announced with regret the death of Mr. J. J. Burnet, of Glasgow, who was elected a Fellow in 1876. Mr. Burnet, who had reached the advanced age of 87 years, took, by his work, a very high rank amongst the architects in Scotland. It would be the wish of the meeting that a letter of condolence be sent to the relatives of their deceased colleague.

This having been agreed to, The Secretary, Mr. W. J. Locke, read the Deed of Award of prizes and studentships for 1900-1901, made by the Council in accordance with by-law 60. The Deed of Award is as follows:—

Prizes and Studentships.

THE ROYAL INSTITUTE SILVER MEDALS.—

(i) The Essay Medal and Twenty-five Guineas.

Three essays on the Comparative Desirability of the Formal or Irregular Treatment of Street Architecture in Large Cities were received for the Silver Medal under the following mottoes:— "For Truth and Dignity," 2. "Modus in Rebus," 3. "Per Ardua." The Council have awarded the Silver Medal and Twenty-five Guineas to the author of the essay bearing the motto "Modus in Rebus," Mr. A. M. Watson (London), and a Certificate of Honourable Mention to the author of the essay bearing the motto "Per Ardua," Mr. William Curtis Green (London).

(ii) The Measured Drawings Medal and 10l. 10s.—Eight sets of drawings were sent in, if the several buildings enumerated, and under motto, as follows:—1. Archer (St. John's Church, Westminster). 2. Cannon (device) Burghley House, near Stamford). 3. Cross Keys (Walpole St. Peter's, Norfolk). 4. Petrel (Holy Trinity Church, Hull). 5. Roda (Church of St. Magnus, Fish-street Hill). 6. Semper Idelis (Gulldhall, Exeter). 7. Stafford Knot (Kirby Hall, Northants). 8. Tressilian (Stoke Newington Church). The Council have awarded the Silver Medal and Ten Guineas to the delineator of Kirby Hall, submitted under the motto of "Stafford Knot" (Mr. Lawrence L. Wright, Nottingham) and Medals of Merit and five Guineas each to the delineators of St. John's Church, Westminster, and Burghley House, submitted under the motto of "Archer" (Mr. Wyatt Papworth, Maida Hill, W.) and device of a "Cannon," (Mr. Henry Francis Graylen, Stamford) respectively.

THE TRAVELLING STUDENTSHIPS.—(i.)

The Soane Medallion and 100l.—Twenty-two designs for a club house in a large city were submitted. The Council regret that they are unable to award the Soane Medallion, but they have voted sums of thirty guineas each to the authors of the designs submitted under the mottoes of "Ars," Mr. M. J. Dawson, Bayswater, W.; "Hiawatha," Mr. H. Munro (London), Westfield, Ipswich; and "Ionic," Mr. J. B. Fulton, London, respectively.

(ii) The Owen Jones Studentship and 100l.—

Six applications were received for the Owen Jones Studentship from the following gentlemen:—1. E. Bennett. 2. D. T. Fyfe. 3. James McLachlan. 4. Percy E. Nobbs. 5. Hervey Rutherford. 6. Ramsay Traquair. The Council have awarded the Certificate and subject to the conditions, among others, that the said candidate devote a tour of not less than six months' duration to the improvement and cultivation of his knowledge of the application of colour as a means of architectural expression, and furnish the Council with an original design in coloured decoration of a prescribed subject) the sum of One Hundred pounds to Mr. J. Hervey Rutherford, Edinburgh, Medals of Merit to Mr. Percy E. Nobbs, I.A.A., Edinburgh, and Mr. Ramsay Traquair, Edinburgh, and a Certificate of Honourable Mention to Mr. Edward H. Bennett, Paris.

(iii) The Pugin Studentship and 100l.—

Nine applications were received for the Pugin Studentship from the following gentlemen:—1. H. Comyn. 2. James C. Cook. 3. Henry

Wm. Cotman. 4. Shirley Harrison. 5. Frederic J. Horth. 6. C. B. Pearson. 7. Harry Phipps. 8. A. J. Pitcher. 9. J. Forbes-Smith. The Council have awarded the Medal and (subject to the condition, among others, that the said candidate devote a tour of not less than eight weeks' duration in some part of the United Kingdom to the study of mediæval architecture) a sum of 40l. to Mr. Henry Wm. Cotman, Streatham Hill; a Medal of Merit to Mr. J. Forbes-Smith, Edinburgh; and a Certificate of Honourable Mention to Mr. A. J. Pitcher, Worcester.

(iv) The Godwin Medal and 100l.—One application was received for the Godwin Bursary from the following gentleman:—Mr. S. C. Stephens, Birmingham. The Council have decided not to award the Bursary this year.

(v) The Tite Certificate and 30l.—Twenty-six designs for an entrance gateway to a public park were submitted. The Council have awarded the Certificate and (subject to the condition, among others, that the said competitor, after an absence of not less than four weeks, shall submit satisfactory evidence of his studies in Italy) a sum of 30l. to the author of the design bearing the motto "Corona" (Mr. William Fairbairn, Edinburgh), a prize of 10l. 10s. to the author of the design bearing the motto "St. George" (Mr. Ralph Knott, Chelsea), and a Certificate of Honourable Mention to the author of the design bearing the motto "Marble Arch" (Mr. W. Arthur Mellon, Ashwell, Herts).

PRIZE FOR DESIGN AND CONSTRUCTION.—

The Grissell Medal and 10l. 10s.—Eighteen designs for a timber footbridge across a stream were submitted. The Council have awarded the medal and ten guineas to the author of the design bearing the motto "Pons Asinorum" (Mr. Edwin Forbes, London).

THE ASPHYTEL PRIZE, 1900.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Asphytel Prize (which is a prize of books value ten pounds sterling, awarded to the candidate who has most highly distinguished himself among the candidates in the final examinations of the year) to Mr. Shirley Harrison, of Leicester. The Council have further awarded extra prizes of five guineas each to Mr. C. H. F. Comyn and Mr. C. E. Varnell, who passed the final examination in June, 1900.

THE TRAVELLING STUDENTS' WORK.—Owen Jones Studentship, 1899.—The Council have approved the drawings and design executed by Mr. John Stewart, who was awarded the Owen Jones Studentship for 1899, and who travelled in Italy, Greece, and Spain.

Pugin Studentship, 1900.—The Council have approved the work of Mr. James McLachlan, who was awarded the Pugin Studentship for 1900, and who travelled in Norfolk, Lincolnshire, Northamptonshire, and Warwickshire.

Tite Prize 1900.—The Council have approved the work of Mr. Percy Erskine Nobbs, who was awarded the Tite Prize for 1900, and who travelled in Italy.

Mr. J. J. Stevenson, F.S.A., then read a paper entitled "Difficulties and Hindrances in Producing Good Modern Architecture," of which the following is an abstract:—

Mr. Stevenson said that the difficulties besetting modern architects were due to the conditions of modern life as compared with those of former times. The hindrances were the laws and regulations which restrict practice and the natural development of building. Traditional architecture did not cease with the new life of the Renaissance, and though the mediæval styles lived on, the new architecture soon became a custom and tradition which every workman knew and could carry out without drawings from an architect. It is only in the last two or three generations that architecture has emancipated itself from tradition; that builders and architects, instead of conforming to established custom, have followed their own fancies and have done what was right in their own eyes, every man being a law to himself. Instead of the few whose force of genius broke through tradition and made an advance in the style, each architect and builder now thinks he must be original, and as original genius is scarce, so are good buildings. The best hope for new architecture is a thorough knowledge with the old, not a superficial acquaintance with many different styles. The style must be assimilated so that the architect can think in it and use it as he does his native tongue.

It might be thought that competitions, with an architect of standing as assessor or as judge, would secure good architecture by criticism

and selection of the best designs. But the result has not justified the hope, and there is now a tendency to abandon the system. In a competition the architect works in the dark; he has to guess what is wanted, and no information the assessor can give in his instructions to competitors can adequately supply it. Architects whose local standing might have entitled them to be appointed for the work, who possibly know more of the conditions and requirements than the assessor, hesitate to be judged by their drawings alone in competition with some young unknown architect from a distance who, if he is successful, has no character to maintain in the district. Sometimes the assessor is one whom architects may fairly decline to be judged by. They may know that he does not understand their art, and his instructions may show that he is ignorant of the requirements. In these he takes a power of decision more absolute than judges in law cases ever claim; they decide only after hearing both sides of the case, and they give reasons for their judgment. But the assessor hears no pleadings and gives no reasons for his judgment. Might not his proceedings be in some degree assimilated to those customary in law cases? The competitors, having studied for months the problems involved, would be able to point out to him how far their plans had solved them, and where their opponents had failed. It is possible that, however fair and able, the assessor may have missed them. They should not be condemned unheard. As to the objection that the assessor would thus know who the competitors were, and might be influenced to give the award to a favourite or a friend, such a suspicion amounts to a libel on the assessor's character. It would be more dignified for the assessor to declare himself incapable of such action by making the decision, knowing who the authors were. It might prevent his overlooking merits in the plans of architects whose character and reputation and the work they had done are a guarantee that they could be trusted to carry out the work. By refusing to know the competitors, the assessor neglects what is a far more important consideration in the selection of an architect than making competition drawings. The faculty of winning competitions is often not a gift of the best architects. The selection of the assessor is the most important factor for the fairness of a competition. Why should not the competitors appoint him by their votes? It would give a better guarantee that they could trust him to understand and appreciate their designs, and if the majority appointed one whom they thought unlikely to do so, they would be able to withdraw before wasting their time and risking their reputation. There would be a better chance of just decision if there was more than one judge, as in important cases in the Law Courts. Opinions vary as to what constitutes good architecture; different views of what designs are best may honestly be held. A judge may see fit to alter his opinion on the representations of his colleagues. As regards the labour and money risked by competitors, there should be a stipulation that architects invited to compete should each be paid a sum towards their outlay. Competitions, wisely conducted, might advance the art and produce good buildings. They should be made such that other architects than those who usually gain them would not hesitate to engage in them; that work done as well as the accidents of competition drawings should be an element in decision; that the judges should have the confidence of the competitors for their appreciation of art in architecture in the various developments now prevalent.

In considering the hindrances in producing good architecture the author referred to the modern rules and regulations by which the designs of buildings are hampered and restricted. These have generally been devised by doctors and sanitary experts for excellent and necessary objects. But instead of availing themselves of the knowledge and experience of architects they devise crude and often tyrannical rules without adequate knowledge of building construction, and without thought as to the architectural appearance or the cost of their requirements. The London Building Act would have been a far more effective measure had the County Council arranged with a body of architects, such as the Institute, the provisions for ensuring the necessary requirements, and the 20,000l.

Parliamentary expenses would have been saved. The Local Government Board's Model By-laws ignored local modes of building, and reduced houses all over the country to a uniform level of dullness. The recent Police Act for Scotland, to ensure ventilation, decreed that ground-floor ceilings should be 9 ft. 6 in. high, and bedrooms 9 ft. But this did not ensure ventilation; it rather provided space for vitiated air to accumulate. Such regulations spoiled cottage architecture, made buildings needlessly costly—indeed, prevented cottages being built. Equally foolish and costly is the regulation that every sleeping-room over 100 ft. area should have a fireplace and flue, though it would probably never have a fire in it and would most likely be stopped up with a smoke-board. Why forbid half-timber construction? It is a most charming development of old English architecture, and houses so built have lasted for hundreds of years. It gives beauty to landscape, and the risk of fire is insignificant in isolated cottages. The precautions against fire are needlessly oppressive for low or isolated houses. Carrying the party-walls above the roofs in ranges of low houses spoils their appearance, and is unnecessary if the slates are bedded on the walls.

In some rural by-laws the needlessly tyrannical provision that all woodwork should be kept back 4½ in. from the face of the wall has been revived after it had been removed from the new London Act. Another needless regulation, showing ignorance of building construction, is that compelling footings to be put to walls besides concrete foundations, which are perfectly stable without them. In conclusion, the author urged the Institute to press upon the authorities the acceptance of by-laws, ensuring sanitation, ventilation, fire prevention, and stability, but drawn with common sense and knowledge of building, and which would not hamper and ruin architecture and cause needless cost.

After some remarks by Mr. W. Woodward, Mr. Lacy W. Ridge, in proposing a vote of thanks, said he especially desired to thank Mr. Stevenson for calling attention, in his excellent paper, to those regulations which were so unnecessarily thrust upon architects in country districts. There was some justification for such regulations in London and other big towns, but it was different in country districts, where, however, by-laws, severe and unnecessary, were enacted. The Institute went last year to the Local Government Board and endeavoured to get something done, with the result that they were promised by the Under-Secretary of that day that attention should be given to the matter. There were now new Parliamentary officials at the Board, and it was time the Institute again moved in the matter. The by-laws which had been thrust upon the country districts were totally unnecessary, and a serious evil which not only architects, but many people in country districts were suffering from. The time had arrived when something like a public demonstration should be made on the subject, and influence brought to bear on the new officials at the Board. The permanent officials would not do much unless pressure were brought to bear upon them. Mr. Stevenson's remarks on competitions, also, were very interesting and well worth attention. Much that was so unsatisfactory in our architecture was the result of the system of competition to which the Institute had committed itself—much more than it should have done.

Mr. John Slater, in seconding the vote of thanks, said the paper had been an exceedingly suggestive one. The chief point of the paper was rightly directed to the hindrances which exist at the present time, and which prevented really good architecture being put up in our cities. With regard to the remarks about competitions, the whole gist of those remarks went to show that competitions on the whole are undesirable and ineffective, and it would be a very good thing if they could be done away with. That was impossible, but he ventured to suggest that one improvement on the principle of competitions, which were now so universally acted upon, would be this: instead of public bodies issuing general instructions to competitors, without limit, to send in designs, they should appoint an assessor who should select for the various bodies who wanted designs a certain number of architects to compete; that those selected architects should send in designs, and that the assessor should then decide which was the best.

He agreed with Mr. Stevenson that there was no harm whatever in a man who had a position which would justify his selection as an assessor knowing the names of the competitors, and that it would be an insult to the assessor to suggest that the fact that he knew the names would have the slightest influence on his selection or on the selection of the best design. If an assessor were to select the competitors, he would, as a rule, select them not only from among the more experienced men, but from among those younger men whose work he might have seen at the Institute or elsewhere, and whose abilities would give him reason to believe that they would produce designs worthy of consideration. With regard to the hindrances of which Mr. Stevenson had spoken, he (the speaker) perfectly agreed with what had been said by Mr. Ridge, who had confined his remarks more particularly to the laws and regulations of the Local Government Board in regard to country places; but here in London architects were hampered in a most regrettable way by the regulations of the Building Act. It was about ten years ago that he had read a paper before the Institute of building legislation, and he then pointed out, before the Building Act of 1894 had been compiled and passed, the great objections there were to laying down hard and fast rules when dealing with an area which had been covered by buildings for many years. With regard to the 1894 Act he did not think there was a single regulation of that Act to which he would have the slightest possible objection in dealing with new areas which were going to be covered by buildings. When they dealt with existing areas under the Act they were met by hindrances and obstructions in every way, and that prevented good building and perpetuated what was bad, in consequence of the great difficulty there was in getting up new buildings. There was one regulation of the Act which came within his purview very often. Mr. Stevenson had alluded to straight streets, and most of the streets of London were straight, but the Building Act made it very difficult to produce any little variations in the outline as to prohibited projections. He had never been able to understand, and he had never met a District Surveyor who understood, the reason for the restrictions as to bay windows. If you start from the bottom of a basement, you can only carry up a bay window three stories, and "story" was not defined in height. If you put an oriel you can go up as many stories as you please, and he could not understand that. Moreover, they could project a bay window 3 ft., but if, in reconstructing an existing building, they wanted to put up a porch, objections were raised by the District Surveyor, and if they went to the County Council, the chances were they would be refused. He had heard only that day of a most ridiculous objection to bringing out a small bay only one story in height. Such hindrances were real hindrances; they made the streets of London heavy and flat and unarchitectural. He believed there was some talk of the London County Council going to Parliament for various improvements and amendments of the London Building Act, and he was quite certain that if architects could show clearly that some restrictions of the Act were inimical to, and the cause of inharmonious architecture, it would be possible to get some desirable alterations made when other alterations were being asked for.

Mr. Lewis Solomon said that when a well-known architect such as Mr. Stevenson came before them to speak of difficulties and restrictions they must be very real. The Institute, as he had proposed at a previous meeting, should do something to get these difficulties removed, and, as the members now knew, a committee had been appointed to inquire into the matter.

Mr. W. D. Caröe said he had on many occasions spoken strongly as to the importance of the judge in a competition being entirely independent of the committee. At the same time he agreed with Mr. Stevenson that two assessors would be very much better than one, and he should like to see two appointed, with the possibility of appointing an umpire in large competitions. If the assessor were to be sole judge of the designs submitted, it might, he agreed, be an insult to the assessor to suppose that he would alter his judgment if he knew the competitors' names. But there was another point of view: a great many committees refused to let an assessor be sole judge; they reserved to themselves the final judgment; and it was a matter

of great importance that committees of public bodies should not be acquainted with the names of the competitors. But committees would not allow the assessor to know the names of competitors where they did not know them themselves. He agreed with what had been said about rural by-laws and the London Building Act, and he agreed with Mr. Slater that architects ought to take the first opportunity of endeavouring to get certain absurd regulations amended, so as to bring London into line with some of the Northern cities. The matter was of serious importance in rural districts, and since the District Councils came into existence things had gone from bad to worse.

Mr. Maurice B. Adams said they must all feel indebted to Mr. Stevenson for the practical manner in which he had shown that good architecture did not always consist in numberless features. Much of our street architecture was ruined by the numberless features which were introduced by some architects, and if only the architects of some of the buildings in Charing Cross-road and Shaftesbury-avenue had omitted some of the features of those buildings, those streets would have been much more satisfactory. Mr. Stevenson's buildings had often struck him as being distinguished by that breadth and simplicity which was so desirable. With regard to modern buildings in towns, one thing which was detrimental to good architectural effect, and which could not very well be helped, was the use of so much iron. A site in the City might be vacant, and a building was put up for some syndicate or other, the chief concern being that the interior should be as much of a skeleton as possible, so that it might be partitioned out with narrow partitions. That seemed to be one of the hindrances with which architects were faced. The only way to deal with iron construction satisfactorily was to recognise it frankly.

Mr. E. W. Hudson said that one difficulty he should like to refer to was, that in London and large towns it was difficult to secure an adequate site on which architecture could really be seen when produced. The way in which buildings were shut in must be present to the minds of all, and it was often impossible to see such buildings owing to an inadequate site. One of the most notable examples of that was the new Law Courts. In the commercial parts of London, that, he supposed, could not be avoided, but with public buildings the country's advisors must be at fault when they crowded a number of offices on to an inadequate site.

Mr. Aston Webb said that all architects suffered from the difficulties which had been referred to. Interesting and thoughtful as was Mr. Stevenson's paper, it was a little pessimistic about modern architecture. It was a great pleasure to him (the speaker) to hear a short time ago one of our greatest architects say, when asked what he considered the finest building in the world, that it was an English building, built within his own lifetime, viz., St. George's Hall. If one of the finest buildings in the world could be produced in our generation, and if in the previous generation the Houses of Parliament (which many competent people would consider to be one of the finest buildings in the world) could be built, there was no need to be so despondent. And it must not be forgotten that both those buildings were the result of competitions, which so many people considered such degrading things, though he would express no opinion on the matter. One of the remedies which Mr. Stevenson had suggested was the study of old work, and most people would agree that the study of old work was essential to the production of new. And yet he would have liked to have heard some other remedy as well held out to the rising generation. Many of them had studied old work for long, and had lived in the memories of some of those fine buildings which had been put up in the last century, and he fancied that the younger men would have to look forward, and, notwithstanding what had been done before, would have to develop some new line. The difficulties and hindrances in architecture were, after all, like other matters in life, one's greatest good. It was the restrictions, the limitations, the difficulties, and hindrances that perhaps brought out one's best energies and best work. When they remembered that the author of the paper read that evening was the architect of the Red House in Bayswater-road they would see that restrictions did not interfere with the production of such an excellent piece of archi-

lecture as that. That there must be hindrances he was quite sure; their work, however pleasurable, must be produced through trouble and pain.

The Chairman said he thought Mr. Webb was quite correct in saying that the paper had been a little pessimistic about the architecture of the present time. He supposed that even Mr. Stevenson could hardly expect that every man of their great profession could be the highest-class artist, but there was a sufficient sprinkling of very clever architects amongst the number, as was shown by the students' work, and the architecture of the present century might not be very far behind the architecture of last century. Mr. Stevenson apparently did not like to be restrained by anything, and that produced an artistic wail against the restrictions of County Councils and local bodies, though with much that Mr. Stevenson had said most of them would agree. With regard to competitions, there was a great deal to be said on both sides of the question. Certainly, in many instances much of the unsatisfactory results of competitions were due to the action of members of the profession themselves, more than to the promoters. If architects would rush into competitions on the most unfair terms they could only thank themselves if promoters did not take the trouble to make fairer conditions or appoint a competent assessor. The Institute did all it could in the matter, and only the other day had written a letter to a committee who had published unfair conditions. An insulting reply was returned to the effect that the Institute's interference was unwarrantable, but the council were able to reply that they wrote in the interests of the profession. He was glad to say the Institute's representations had been successful in a good many cases. In regard to rural by-laws the subject had been before the council that very afternoon, and it had been decided to approach the Local Government Board again.

The vote of thanks having been heartily agreed to,

Mr. Stevenson, in reply, referred to Mr. Aston Webb's remark that it was the difficulties that often made an architect. It was indeed the case that difficulties such as these were to the architect his opportunities, and that all the most interesting things in architecture had been attained by the architect getting over his difficulty. He sympathised with Mr. Adam's remark when he instanced the Shaftesbury-avenue. In the first draft of his paper he had cited Shaftesbury-avenue as an instance of what a modern street should not be from its extreme restlessness. But he cut it out, as he had cut out a good many other things, lest his paper might be too long. Mr. Hudson had referred to the inadequacy of old photographs which hung on the walls for them to see to show what good buildings they could get, and what splendid effects could be produced, on what a modern man would call perfectly inadequate sites. They were, he thought, quite wrong in thinking that it made a town healthier and finer to have great wide spaces. The Strand was a much finer street than, say, Oxford and Cambridge terraces, and there was something in a point with regard to the ventilation, which he had mentioned in his paper, but had not had time to elucidate. Better movements of air were secured where there was a wide open space and narrow streets opening into it. The ventilation and esthetic effects were far greater than where they had, as in Manchester, all the streets of the same width, never one more nor one less. Of course there were difficulties in the matter for the officials concerned; but if it was possible to allow some freedom and variety in that matter, he was certain that was one of the things that would tend to improvement. With regard to the assessor, one speaker suggested that he should be given even more power, not only to decide the competition, but to select the architects to compete. His point was that the assessor had too much power already. It was said as an objection to naming the competitors themselves, that although the assessor might be above suspicion of favouritism, members of the Committee might not be. In that case, again, the precaution seemed to him futile, because, if a member of the Committee wished to favour any one, the person he wished to favour might easily let him know which was his design, and his friend on the Committee could bestow the favour without incurring any discredit for doing so. What was wanted was perfect

openness—let everything be above-board; let the competitors put their names on the drawings; let the assessor, whether a judge or an assessor, give his decision and let it be known to the competitors; and he should also strongly advise—try at least what would come of the competitors, when they were appointed and paid, electing the assessor.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this Association was held in the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., on Friday last week, Mr. W. H. Seth-Smith, President, in the chair.

The minutes and some nominations having been read, Messrs. H. Cayley, S. A. Hall, and A. S. Tanner were elected members.

Mr. E. T. Hall then read the following paper on

Flats.

Mr. President and Gentlemen,—When your committee invited me to write a paper to read before the Association on "Flats," I accepted without reflecting on the difficulty of the subject given to me. The title was so short and seemed so simple, but the seeming simplicity of the subject is a delusion.

A house of one story we call a bungalow, but "flat" is the name we give to a self-contained residence on one floor of a many storied house. It is not euphonious, and it is not descriptive. The name betokens a lack of imagination, and it seems to me inept to adopt such a word to describe the abode of a large and increasing number of people. We do not often use the word for workmen's dwellings, but generally only for those of the richer class. We might as appropriately call an ordinary town house a "vertical." However, such as it is, the term is now accepted in England, or at all events in the south. In Paris *appartement* appears to be the accepted designation of such a residence as distinct from *piece d'un appartement*, which designates a room in a set of apartments. In Germany there appears to be no word to distinguish a "flat" from a house proper, *Wohnung* or *Wohnhaus* are applied to both.

I suppose it is not more than forty years ago when flats on any large scale were introduced into London. Among the first, I think, were those stuccoed buildings in Victoria-street, and I can remember how some of them remained for years unfinished, so little or so slowly did the idea take on. This is surprising, because they had long been established in—for example—Paris and Edinburgh, two cities which have had many things in common since, and even before, the days of the Stuarts. In England, however, habits are very conservative, and it took even the relatively travelled people of London a long time before they would accept a flat as a permanent residence. In the provinces to this day there are many cities and towns where no flat is known, as, for example, in go-ahead places like Leeds, Liverpool, Manchester, and Cardiff, to cite places wide apart where there is plenty of energy and activity; and in two or three of these there are not any many storied buildings for the working classes. As illustrating the feeling that prevailed until the decade 1880-90, hardly any insurance company would invest in ground rents secured on flats or lend money on mortgage of such buildings.

From about 1880, however, flats began to move—as the phrase goes—and the projects for their erection steadily increased year by year until we have now a very large number of such buildings in all parts of London and in many of the suburbs. Many people of the well-to-do classes who formerly only hired a house for the season now take a flat by the year in lieu of a town house, to which they can come when they please. With a town house absence means at least caretakers and structural maintenance, whereas a flat may be locked up and the keys left with the porter, on the assurance that all will be safe during the tenant's absence.

It may be interesting for a moment to make a slight digression by noting that the period which has seen the birth, growth, and acceptance of the flat as a residential unit has coincided with the immense development of hotel life in London. I can just remember the completion of the Langham Hotel. I heard people say that it was a mistake to build

an hotel of that size, that it would never pay. &c. That was the pioneer of the modern hotels. It was followed by Charing Cross and Cannon-street, Holborn Viaduct, the Grand, the Metropolitan, the Midland, the Victoria, the Fifth Avenue, the Grand Central, the Russell, and others further afield. The restaurant, too, was of the same period. It is within my time that outside a club or a chophouse there was hardly a place where one could get a decent meal, and certainly no place where one could take a lady except it were to an hotel. There were one or two Italian cafés, but if I remember aright the Holborn Restaurant was the first of any size to astonish the Londoner with its comparative luxury, cleanliness, and good cooking. This was soon followed, and now there are as many restaurants in London probably as in Paris, although not quite on the same lines. However, we must return to our subject.

Accepting, then, the fact that flats as a distinct class of property have taken firm hold of London and consequently afford an extensive field of operations for the architect, let us consider what are the problems to be solved when one has to design a building of this class. First, locality will have something to say. If the site be in a main West End thoroughfare where shops are the essentially lucrative part of the property and have to form the ground-floor or possibly two floors, it will not, as a rule, be found to be remunerative to put family residences above, but bachelor suites generally with one sitting-room, one bedroom, and a bathroom will be found to meet a considerable demand. In the side streets of clubland similar suites, sometimes with a manservant's room attached, will realise high rents. In Bayswater, Kensington, Chelsea, Westminster, &c., flats over shops will as a rule only be taken by the lower middle class, but in blocks which are exclusively residential and of good style there will be a considerable demand from well-to-do people of all sorts who do not wish for the trouble of a large house, the expense of a garden, &c., and who periodically shut up their flat and go away. In Hampstead probably as high rents can be obtained as in Kensington, but in Battersea Park, and still more in places like Brixton and such suburbs the style and the rents must be simpler and cheaper respectively. The locality, therefore, and consequently the class of tenant, will exercise an influence on the whole design.

I have noted that as a rule family residences for well-to-do people will not be readily taken if over shops in a main street in London. It is strange that this objection does not hold in Vienna and Paris, where family suites in the heart of the cities are the rule, and are sometimes sumptuous. I suppose the difference lies in the temperament of the peoples. In England the mistress of the house and the family generally like to have the opportunity of being quiet; "a quiet evening at home" one constantly hears as a phrase. In France and Vienna the genius of the people is for bustle, vivacity, stir, and movement. To some natures quiet is appalling and abhorrent. I have before me a book of new buildings in Paris—apartment houses—and of a total of fifty depicted, thirty-four are in main streets and have shops on the ground floor.

Another difference to be noted is that in Paris the rule is to make a service staircase in addition to the principal staircase; in Vienna and London this is not usual, although of course there are many instances to the contrary. In a building with only one principal staircase the service staircase is a great protection in the event of fire, and where the floors are extensive I think should be made compulsory, but it should be at a distance from the other, and should be next an external wall with windows in it to enable the smoke to escape. In some modern and handsome Parisian buildings there are stately principal staircases which are lighted by glazed partitions, or, as we call them, "borrowed lights," from the service staircase which itself has windows. This is bad. If a fire occurred, and the flames went up one staircase, the other would be rendered useless for escape by the breaking of the glass partitions between. When there are two or more principal staircases this fire exit can be made by carrying both or all up to the roof, forming there a fire-resisting passage from one to the other. In St. Ermin's Hotel and Mansions at Westminster, designed by me, where the buildings cover a site of about an acre, and there are some 650 rooms, I have six staircases with such intercommunication. It is

strange that in Vienna very large blocks have sometimes only one staircase with a comparatively narrow passage leading to it from the street through the main block. There is one such on the screen where there are six stories and four suites on a floor.

In London the reason for excluding service staircases is generally the desire to keep tradesmen's boys out of the house, and to avoid the uncontrollable "back door." Very frequently goods are transmitted from the ground floor by small hand-service lifts passing outside the kitchen window or service hatch, and very useful and speedy lifts can be made by using bicycle wheels at top and bottom with ball bearings, wire ropes, and two balanced covered cages or buckets. Apparently in Vienna in many buildings all goods come up the one staircase to the front door.

A further point to observe is the very small kitchens and offices of the Paris and Viennese flats; 13 ft. by 10 ft. appears to be considered ample, and many are much less. There is no scullery, but sometimes a small pantry with sink is attached. This, however, is by no means general, and a larder is still more rare. I am told that small as the kitchens not unfrequently are in Vienna, it is by no means unusual to find them very handsomely fitted, the walls tiled and decorated with handsome ware. My informant says perhaps 300l. is spent in such a way, and the mistress takes her friends to see the kitchen.

Yet another point of dissimilarity from our practice is the fact that in Paris frequently there is apparently no bedroom for the servants within the suite. In some cases the servants' bedrooms for the whole building are on the top floor, although there are many separate suites in the building. I should think a good deal of inter-family gossip is thus exchanged. In Vienna generally one small bedroom for a servant is provided, sometimes opening only from the kitchen. There is on one of the drawings displayed one handsome suite of rooms, with such a bedroom about 45 ft. in area, in another 70 ft. in area. These are not healthy. Certainly 100 square ft. should be a minimum. Of course, I do not know that other rooms may not sometimes be allocated to servants, but having regard to the few bedrooms and the size of the sitting-rooms this does not appear to be probable. In London it is usual to house the servants within the flat, but here, as well as in Vienna, the vice of making a bedroom open out of the kitchen is still practised, and when one reflects that slops have to be carried through the kitchen in times of sickness and of health, it will be seen how insanitary such an arrangement is.

Our friends abroad are not always so particular as we are in other sanitary matters, and you will note on the screens some bath-rooms with no light and not against external walls, larders similarly situated, even behind water-closets, and the evil practice which obtained in England, even within the last half century, is still maintained abroad, of lighting and ventilating water-closets from staircases and passages. Here that is no longer possible, thanks to our sanitary laws, and I feel sure that our friends abroad now realise the evil of such arrangements, and will not be offended at my mentioning the defects should any of them honour me by reading my paper.

I have yet another little sanitary point to mention, and that is the danger of taking soil pipes of flats down inside the building against external and even internal walls in chases. Such chases afford channels for carrying infectious diseases from one suite to another. They are passages for vermin and for sound, to say nothing of the danger if the pipe leaks. Our laws have practically banished this evil from London, although I well remember to have seen it practised in some of our pioneer flats.

Internal staircases, however handsome they may be, with only top light and ventilation, are also to be deprecated in confined areas where there are many stories of flats. Such staircases, in the event of fire, become furnace shafts, and at least get full of smoke, choking those trying to escape. The odours of the lower part of the house ascend to the top, and again illness is conveyed by them from one part to the other. While many will realise the last mentioned evil, it is not all who pay attention to the point I am about to mention, and that is the necessity for a current of air through small internal areas or courts extending from

the ground to the sky. These small courts are frequently and not inaptly called "well holes." Now every one knows that the air at the bottom of a well is often so bad that a candle will not burn in it. A "well hole" area without through ventilation is in a lesser degree bad in the same way; and when, as is generally the case, there are gullies at the bottom giving off foul gases from fermenting deposits, it can be realised that windows opening into such areas are merely inlets for poison. All such areas should be ventilated by means of an inlet of large capacity at the bottom from some road or considerable open space where there is always movement of air going on.

Fourteen or fifteen years ago I realised the evil and practised the remedy, and we obtained its insertion in the London Building Act of 1894. I was much pleased to see the necessity for this bottom inlet to small areas urged in a recent letter from M. Poupinel, of Paris, when he was kindly forwarding some of the drawings now exhibited, and it will be seen that he has inlets to his small courts in the houses Nos. 8 and 10 Rue Descamps. M. Poupinel has also taken fresh air flues from the exterior to every fireplace in his building, and he has outlet ventilators in his kitchens. We, in London, are accustomed to outlet ventilators from not only kitchens, but reception rooms and bedrooms, but they are uncommon abroad, and the atmosphere of a stove-heated and un-ventilated room on the continent is something to be remembered by those accustomed to fresh air.

There is only one further point to mention before leaving this hygienic branch of my subject, and that is the desirability in our cities of having large windows in our rooms and keeping the tops of them reasonably near to the ceiling.

A subject that may profitably engage our attention for a minute or two is the construction of the floors. In all high buildings for many families the floor should be of fire-resisting material. Some years ago Mr. Evans patented a floor which was composed of ordinary wooden joists laid close together and well spiked thus making a solid wood floor. I do not know what has become of the system, but its tests showed it to be practically impervious to fire, and from its fibrous character it was claimed to be sound-proof. Another mode of constructing a floor is to fix rolled steel joists and build 1½ in. thick brick arches between. This used to be the most common method of construction in London, and it is still much used in Vienna. We see it shown on one of the exhibited designs. Above the brickwork were wood joists and an ordinary floor. The most common because cheapest method used in England is, however, to place rolled steel joists at regular intervals, generally 2 ft. apart, and to fill the space solid with concrete made of cement and coke breeze, bringing the soffit of the concrete an inch or two below the joists to protect the steel from the direct action of the fire. Frequently small fillets of wood were, and sometimes still are, laid on the concrete, and the boards nailed to the fillets; without ventilation, however, if the floor is covered with linoleum, such fillets and the boards over them may decay from dry rot, and the same remark applies to linoleum laid on boards nailed direct to concrete. One objection to the solid concrete floor is that it is not impervious to sound. The only way to remedy the evil is to get an air cushion beneath the floor itself, and to suspend the ceiling. There are several ways of doing this. To get over the difficulty regarding wood floors where these are intended to be covered, I have in many recent buildings dispensed with boards, trowelled the floor with cement, and covered this with linoleum, either plain or ornamental. At once a furnished appearance is given to the floor, and rugs or carpets look well on it. The material is pleasant to the tread, it is not so resonant as wood, and there are no joints in which vermin may harbour.

I much fear that so much detail is wearisome, and yet it is valuable, and for the most part essential to an architect to know it all before he can start to make a good design with the hope of getting a successful result.

Turning now to the æsthetic side of the subject, let us consider the block plan. First of all, do not crowd too much building on your land. Doubtless a site that is crowded will show a large rent-roll on paper, but the building will not in the end be so popular as an open and more airy and consequently more healthy block, and the

rents of the former will have to be reduced. Of course the shape and extent of the site will largely determine the block plan, but for our purpose we will assume a considerable area to be at our disposal. It may be laid out with a large carriage quadrangle in the centre, as in the examples on the screen of (1) No. 87, Boulevard St. Michel, or (2) No. 32, Rue la Boétie, both belonging to Le Nord Assurance Company, the architect being M. M. J. Nerrot. In these the entrances are from the courtyards. In Mr. C. J. Pawley's, St. James' Court, Westminster, we get one large courtyard with a narrow roadway on each side leading to it behind and through the front block.

Another type is where the main entrances are from the roadways, as, for example, Der Habighof, Vienna, Herr H. Adams, architect. Here we have as characteristics two blocks parallel to the Hauptstrasse and one facing the side street. The internal courtyards are used merely for light and air. There is a third method, as at St. Ermin's, Westminster, where the buildings are U-shaped, the large central quadrangle being open to the south or main front. This open quad may, however, be at the back if the aspect is more suitable at that side. This third method is shown in Mr. Paul Hoffmann's recent buildings, 171-5, Queen's-gate. The enclosed quadrangles permit of more land being covered than where the fourth side is left open, but the latter scheme has many other advantages. Even, however, on a comparatively small site a very pretty effect may be obtained by having a central circular carriage court, partially glass roofed, over the ground floor, the area above being open for lighting and ventilating the staircase and rooms. An example of this may be seen on the walls.

Coming to a consideration of the internal planning of the buildings I think a good public entrance hall on the ground floor is a *sine qua non*. The porch and vestibule should be simple, and may be plain. The hall should be spacious; not a mere passage, but a good room, well lighted, the walls panelled in wood to a considerable height, having a large, hospitable fire, and a panelled ceiling. Personally I do not like the "gorgonzola" and other marble wall effects which are so frequently seen in modern blocks. They are not, I think, in harmony with essentially domestic buildings, and I prefer the more cosy effect of a good hall in a country house. Of course columns may enter into the composition with great advantage, and any scheme of colour.

The position of the staircase must of course be governed by the shape of the site, but if it can be made a part of the hall scheme so much the better, as it produces an effect of spaciousness which is valuable. I would draw attention to the very general feature abroad of staircases planned as semi-circles, ellipses, or on other curved lines. The result is very pleasing, and contrasts favourably with the straight flights of stairs in a rectangular space so frequently seen. I do not like curved flights of stairs to extend without any intermediate landing, from floor to floor. These appear to me rather monotonous, as well as tiring and dangerous. They are, however, common in Paris.

I think the best planning, internally, is where on each floor there is but one flat off a main staircase. Such a flat is more private, and gives an idea of not being limited by its neighbour. There may, of course, even with this arrangement be several staircases within the building itself, and several flats on a floor. Of course "the one staircase one flat" idea would only be practicable when the flats were of considerable size. When there are family suites, each of but five or six rooms, one staircase may reasonably serve two suites on each floor. This gives a certain elasticity to the place, as two small suites may then be combined and let as one large one. In high buildings I think it is not desirable to have a greater number of flats on a floor to one staircase. Mr. Hoffmann, at Queen's-gate, has his centre block with one flat to a staircase, and the wings with two flats to a staircase. The plan is an excellent example of how to lay out a large site. In the Avenue Ledru Rollin, No. 68, M. Montalto gives another good U-shaped plan, with the quadrangle at the rear and two flats to a floor. The site is out of square, but the planning is admirable, and all parts are well lighted. There is one main staircase, and there are two service staircases adjoining the kitchens.

The planning of a flat itself is an interesting

problem, one requiring great thought. First, there should be a good and well-lighted hall, or antechamber. The reception-rooms should be readily accessible from this, the bedrooms more retired, and the offices out of sight, but handy for service to the principal rooms and to trade access. Efforts should be made to get away from a mere narrow passage hall, and to adopt some more compact plan. An octagon or a circle, a hexagon or an ellipse will form pleasing forms, and all admit of decorative treatments. A good example of an octagon treatment may be seen in M. Nerrot's building in the Rue la Boétie, and there is another at No. 42, Avenue Henri Martin. The rooms, too, even in rectangular sites, need not all be square or rectangular. M. Poupinel, in his No. 10, Rue Descamps, gives an excellent plan of a flat, interesting as a composition, the rooms of different geometrical shapes, passages well lighted, the whole convenient and well arranged, although, perhaps, the hall might have had a better window in the angle without injury to the other rooms. In this building we note on the ground floor an up-to-date cycle stable in a convenient position, an elliptical staircase with lift, one suite on each floor consisting of three reception and five bedrooms, bathroom, two water-closets, a little kitchen (about 11 ft. 6 in. by 9 ft. 9 in.), with an "office" or pantry fitted with cupboards, between it and the service staircase. There is a meat safe in the kitchen window, but no separate larder. I have already referred to the servants' bedrooms on the top floor, to the ventilated courts, &c. I venture to suggest that it would have been better if the service staircase had an exit on the ground floor distinct from that through the main entrances.

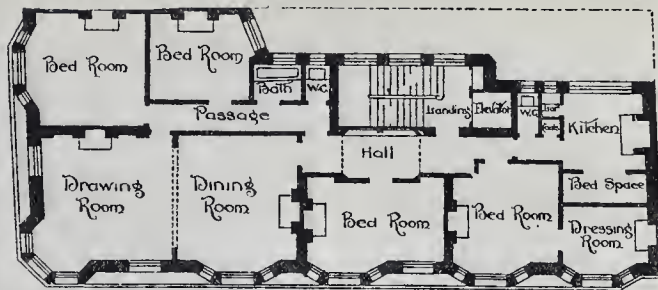
As to height of rooms, it appears to be very general to adopt about 10 to 11 ft. in clear in all three capitals. I think this ample for moderate sized rooms; a greater height makes them appear smaller in area. Windows should be ample, especially in a city, and I would draw your attention to the large size of doorways in the Parisian examples. Passages should be light, and the more direct the better. Do not forget to provide ample cupboards. Baths, sinks, water-closets, &c., should not be all over the place, but, within reason, grouped near together.

On the subject of planning, I would sum up shortly by saying, make your plans interesting, bright, and above all study to make them simple, the simpler the better. You may be sure if you see an intricate plan it is ill-digested, inconvenient, and generally not so well lighted or ventilated as it should be.

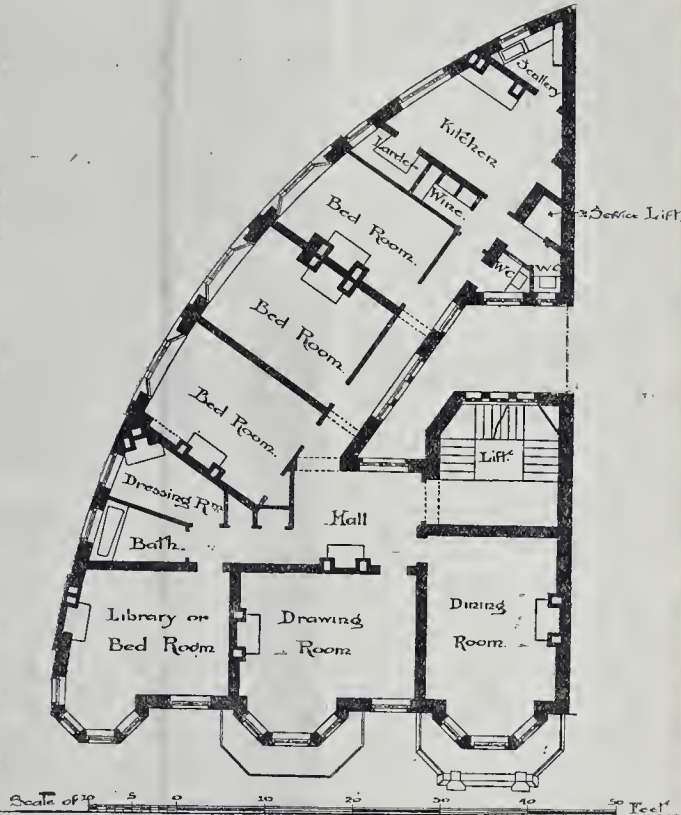
We have hitherto considered only large sites, but there are a greater number of small sites which have to be treated, and I would refer you to Baron Max Ferstel's design of a house in the Stammgasse, Vienna. It is six stories in height, the top floor containing studios. The other floors contain each a flat with five rooms, in addition to a kitchen with servant's bedroom attached and a larder. Here the two nurseries are placed at the rear, with separate service from the kitchen. There is also an access from the living-room to these children's rooms, so that the mother has a ready control. The bathroom and water-closet are ventilated into a small area, but the bathroom is only apparently accessible from the living-room, which appears to me to be an undesirable feature.

The planning also of the suites over the Café Secession, in the Rothenthurnstrasse, by Professor Julius Deininger, is worthy of study. Herren Fillner and Helmer, in No. 21, Schottenring, have a pleasing and clever little plan, with a good courtyard. The suites have a hall, three rooms, bath, and water-closet.

Among the Parisian drawings there is an excellent treatment of an acute-angled small site at the corner of the Rue Montmartre and the Rue Réaumur by M. Gautrin. The angle itself is occupied by a circular salon, the other six rooms all face the two streets; the staircase is circular, lighted from an internal court, and the passage is also well lighted. M. L. Carrier, at the corner of the Rue du Faubourg Saint Honoré, has also a most convenient and pretty treatment of a good site. Another good plan is that at the angle of the Faubourg St. Martin and the Rue du Château d'Eau by M. Rives. In London, Mr. John Slater's corner of Mortimer-street is convenient and well lighted. In Palace-chambers, Buckingham Gate, Messrs. Martin & Purchase have an angle site which appears to have required considerable thought to evolve a plan to give good light to all the



Palace Chambers, Buckingham Gate. (Messrs. Martin & Purchase, Architects.)



The Mansions, Sloane Gardens. (Mr. E. T. Hall, Architect.)

apartments. Perhaps it may be permissible to mention one of my own buildings with a rather awkward site. It is a quadrant on plan at the corner of Sloane Gardens, and is shown on the screen. Among the plans of bachelor suites we have one of Mr. John Slater's for a very shallow site in Well-street. He puts two suites to a floor off each staircase, and also, in addition to a parlour or sitting-room, two bedrooms, and a bathroom with water-closet in it, gives a small kitchen. The whole forms a very small self-contained residence, to be let at a low rent. Mr. Paul Hoffman, in Harewood-place and Hanover-square, has one staircase, a corridor common to several suites, each containing an entrance-lobby, a sitting-room, bedroom, bathroom, and water-closet, but the two end suites can be combined to make a family suite.

I would draw your attention to two sets of plans of large buildings in Vienna the sites of which are acute-angled triangles, both by Professor Carl König. One at the corner of two streets is the palais for Herr Josef R. von Herberstein. It has a carriage entrance in the centre of the principal front, a small glass-covered courtyard in the centre, and a way through to

the side street. You will note that there is a stable within the main building entered from the courtyard. The second and third floors are divided into two complete suites of flats. Two principal staircases are carried to the mezzanine and first floor. One of these only goes up higher, and a service staircase is carried from bottom to top. A difficult site is well utilised, and all parts of the building are well lighted. The other building, with a site of almost identical shape but larger, is surrounded by roads, the Augustiner Strasse, the Tegethoff Strasse, and the Fühlich Strasse, and the approaches are arranged in the same way. No elevations have been sent. There are others of Professor König's designs which will repay study. In the Palais Leon-Wernberg, by Herr Burath von Neumann, we have an example of another large building with a good central area. One staircase above the first floor serves a large number of rooms, forming two suites per floor. From the landing an outer gallery gives access to the suites and borrowed light to two or three rooms. On the first floor I would note the careful planning of the acute-angled excrescence on the right hand. The

same architect sends us drawings of two other large buildings erected from his design. It may also be of interest to compare the design by Herr Victor Siedek in Vienna with that by M. Michel Rabier in Paris for sites of nearly the same shape.

It would not appear to be desirable to carry the limits of my paper to a further detailed description of planning, and I will conclude by some observations on external design. Manifestly, the accessibility of material will have an important influence on design if the architect intends to display his building material. In Paris stone is practically always used. In London red brick, with or without stone, is generally used. In Vienna the construction is very largely of brick, but the facing is of stucco or cement, and so are most of the columns and architectural detail, even in some of the largest buildings.

Owing to the commercial requirement that every floor of flats must be equally well lighted and to the structural desirability in high buildings of getting voids over voids, which together very generally result in windows being made of the same width on each floor, a Classic treatment is nearly out of the question.

Gothic, except in its latest English style, has not been attended with great success, and practically everywhere some branch or phase of Renaissance has become more or less the accepted basis of design. I have used the word Renaissance in a wide sense because, while some have introduced the normal Italian features, others have broken quite away from them. We know how, more in sorrow than in anger, one of our own Classic masters laments the depravity of a truant architrave or frieze in an entablature, and I can quite imagine the similar sensations of some of his Austrian colleagues at what is, I understand, there called the Secession style.

A very interesting example of this style is shown in Professor Julius Deininger's "Romahof." Note the original treatment of the exterior, the sculptured figures on the angles of the bays, the panelled pilasters with masks and long pendent ribbons, the coved floral cornice without architraves or necking, the carved or rather modelled surface treatment of growing trees. Another example is a house in Wenzels Platz at Prague by Professor Jan Kotěra, pleasing and refined in treatment; or, again, Professor Otto Wagner's house in the Magdalenenstrasse, Vienna, of which two views are given, one showing the circular angle of the building, with its pavilion on the top story flanked by pilasters, on which an effect of plain and rusticated courses is produced by a decorative treatment of growing foliage; the other illustrating the elaborate surface decoration of the principal elevation. There is also a design by Herr Oscar Marmorek, Der Nestroyhof at Vienna, illustrating that architect's views on modern architecture. Herren Fellner & Helmer's design for the building on the Franz-Josef Quai in Vienna is quite different in character, and is a refined treatment of Renaissance. Their St. Annahof is an example of design in a mediæval style, quiet and picturesque, the surface unbroken by strings and capped by a small cornice. The lower part is enriched with broad bands of nearly life-sized figure subjects modelled in bas-relief.

In Paris the architecture of the apartment house has generally its characteristically native treatment, shows great refinement, and, in my view, adapts itself admirably to the purpose of the buildings. If I may single out one or two illustrations as indicative of this adaptability, mention might be made of the exhibited design in the Rues Réamur, Ledru-Rollin, and Château d'Eau among many others.

In London the most conspicuous block is on the Embankment—Whitehall Court, by Messrs. Archer & Green—a stone building, as to design based on French Renaissance. Most of the other flats in London are of red brick and stone combined. They are well known and accessible to all of you. Doubtless in some, and may be in all, there are features which, whether admirable or not, are suggestive, and from which you may derive an inspiration of great value.

Well, sir, I am now coming to an end. My endeavour has been to recite first the practical and hygienic considerations regarding safety from fire, exits, ventilation, and sanitation, which form the very bed-rock on which to base a design; then on this basis to consider the æsthetic side, to suggest principles governing the laying-out of various sites, the internal planning and lighting of the buildings and their



Apartment House, Prague. (Professor Kotěra, Architect.)

exterior treatment. I have sought to interest the meeting by illustrations from the works of many architects at home and abroad. If I have succeeded in offering any food for reflection, then my labour will not have been in vain. In conclusion, I have to offer on my own behalf, and I am sure on yours also, our cordial thanks to our colleagues at home and abroad who have so kindly lent their drawings to-night. Their names are given in the body of the paper.

Mr. Locke, the esteemed secretary of the Royal Institute of British Architects, very kindly responded to my request to assist me in getting foreign drawings, and wrote to Baron Max Ferstel, of Vienna, and to M. Poupinel, of Paris. To both those gentlemen we owe an especial acknowledgment for their great courtesy in sending us so many drawings. Baron Ferstel especially must have taken infinite trouble to collect from so many architects the very large and interesting series of representations of their works which we have been privileged to examine. You will, I know, desire me to send through both the gentlemen I have named your greetings to them and their colleagues, with our expression of a hope that the new century may strengthen the bonds of amity between our respective countries.

Mr. J. J. Stevenson, in proposing a vote of thanks to the lecturer, said that one thing which most strongly affect the planning of flats in England, as compared with France, was the system in France, especially in Paris, of putting the bedrooms of the servants, male and female, on the top floor of the building. The system—an old one in Paris, where flats, or apartments, had been in existence a long time—was one which we should not tolerate in England, for it was neither good for the servants or the masters, and it would always be one of the great difficulties in the designing of flats in England. In large London houses the basement floor occupied a great deal more space than any other floor, and it was extremely difficult, on the space available for the flat, to plan the servants' quarters—the kitchen, &c., and their bedrooms especially—as servants could not now be crowded three and four in a room as they used to be. It had occurred to him that, instead of flats all on one floor, it might be possible to make a flat of, so to speak, two floors with a sort of two-storied house—a collection of two-storied houses one above the other. He thought there might be some economy of space in such an arrangement. In flats there was a good deal of dreariness due to a lack of open air space about them, and in order to see the sun straight above his head an occupant of a flat had to go down so many floors. That was a point which might receive the attention of designers of such buildings. He had seen some flats where it would have been far better that a part of the available space should have been left outside the walls, with the free winds of Heaven blowing round, and, following the examples of some of the old palaces in Italy, it was wonderful what an idea of garden and greenery could be got in such buildings by the skillful planning and adjustment of small spaces. If he had to live in a flat, that want of open air would cause him to prefer living at the top, and it had occurred to him that the roofs of such buildings might be treated as gardens for the use of the occupants below, so as to give them an opportunity of getting fresh air—though there was one drawback to that, viz., that such places would be exposed to smuts from chimneys. It was a matter for congratulation that so many architects at home and abroad had sent drawings and diagrams to illustrate the paper, and thanks were especially due to Mr. Hall for the trouble he had taken in the matter.

Mr. Paul Hoffmann said, as to the remarks of the last speaker in regard to two or more flats, one above the other, he knew of one or two examples where that had been done. One was the well-known block of flats, designed by Mr. Norman Shaw, adjoining the Albert Hall. Mr. Shaw had adopted the plan of having the drawing-rooms—in fact, all the residence-rooms—of considerable height, viz., about 18 or 20 ft., and on to these he had put two stories of bedrooms and kitchens, connected in the rear by a private staircase. It was a rather economical arrangement, and fireproof floors were not necessary to the floors dividing two flats. Another way of doing it, and one which was often adopted, was to combine a

flat below the topmost story with a flat in the roof. In regard to gardens, these could be taken into consideration where the site was affected by ancient lights, and in planning flats the question of ancient lights was an important matter. On the Continent this was not so, and all that an architect had to do was to keep his building about 10 ft. from the window which would be considered to have an ancient light. In this country, however, there was no law, only a suggested angle of 45 deg., and where such an angle was required, it would be possible to set the houses back and form ledges or terraces which could be used for gardens. He did not think that, generally speaking, flats in England compared unfavourably with those on the Continent, considering all the difficulties architects had to contend with here, especially that of having to submit designs to so many interested parties. He might add that such a thing as the leasehold system was not known on the Continent, and that considerably facilitated matters for the Continental architect.

Dr. J. F. Sykes said he spoke entirely from the point of view of a sanitarian, and not from the point of view of an architect. London, apparently, was going to be rebuilt in flats, and that was a most important matter for the architectural world, especially in regard to the lines on which such buildings should be laid down. Abroad, everything was cut and dried, and such questions as light and air had all been settled; but in London it was not so, and there were a great many difficulties in regard to the construction of such buildings as flats. On the Continent it had been the custom for years past to construct houses round a central courtyard, but that had not hitherto been the custom in England, where houses had been constructed as open houses round a street block. Those who had been abroad had noticed how common were the central courtyards, but that was a feature to be avoided, if possible, especially in the extreme way in which it was carried out, particularly in French towns. It was extremely desirable to get air into flats, and for that reason it was important to avoid the central courtyard. In the ordinary house there was the well-staircase, with windows opening on to it, as well as all the rooms of the house, so that each room got ventilated independently of every other room. A flat was, practically, one large room divided into apartments as a rule, but in the ordinary house the staircase-well acted as a ventilating well; but not so in the flat, because it did not exist, and some means of ventilation must be adopted to replace it. Some flats had ventilated corridors, with all the rooms opening on to the corridor; others had corridors running from back to front, and sometimes there was only a vestibule. Mr. Hall spoke of having a vestibule in the centre, but he (the speaker) greatly objected to closed vestibules in flats, because an occupant could tell what he was going to eat long before meal time, and the odour of one room would pervade the other rooms owing to the difficulty of ventilating the vestibule. [Mr. Hall: My point was that the vestibule should be ventilated.] The difficulty was to get that done, and many such vestibules had no ventilation whatever. There were things to be avoided in the construction of flats, which were very difficult to avoid. He would give them a practical illustration. In some parts of London where the well-to-do once lived, and in other cities, there were houses—generally the old type of self-contained house of ten or twelve rooms, which had been subtle, with the result that, each room being occupied as a separate dwelling, the chimneys of the building always smoked. That was invariably the case, and it was due to the enormous draught in the chimneys created by so many fires extracting the air and causing each chimney to pull against the other. If one fire was lighted the air was pulled down from another chimney, and it would be an extremely well-planned and well-ventilated house where that was not so. In flats that were occupied by a number of people at the same time, and where a number of chimneys were being used, the air of one chimney tended to draw against the other, with the result that in flats the chimneys did not draw so well as they did in ordinary houses. Moreover, another result of chimneys of flats not drawing well was that the air in the rooms was kept in a stuffy condition. The point he wished to dwell most upon was that the air of a flat was the main point to be considered, and it was a point which the archi-

tect would find it extremely difficult to deal with.

Mr. F. G. F. Hooper, in seconding the vote of thanks to Mr. Hall, said they had been very much interested in seeing the illustrations of flats by foreign architects. A most valuable education in the planning and arrangement of such buildings was obtained by living in one of them. It was extraordinary what a number of little points could be found out in that way. As to the treatment of stairs in such buildings—whether there should be one or two staircases—he had lived in a flat in Westminster where there were two staircases, and one of them, the servants' staircase, had a well. The occupants of each flat heard all the conversation and noise which took place on the servants' staircase, and from that time he had always advocated a solid newel where a servants' staircase was planned, and he was rather surprised that so few plans made such a provision. Scarcely any of the continental architects provided a solid brick newel, but for all that it was a good method for keeping a building quiet. Mr. Hall had alluded only to what were really self-contained flats, but there were many flats which were worked, in a measure, on the co-operative principle, the rooms were shut off and each tenant could have his private rooms, though the service was in common, and the kitchens and servants' department were worked from a central position. The convenience of that was obvious in many respects, especially when an occupant wished to go out of town for a few days. It was all very well to suggest that the occupant of a self-contained flat could shut up his rooms when he wished to go out of town; but what could he do with the servants? True, he could leave them in possession, but where would they be when he returned? He (the speaker) would do almost anything rather than be a servant in some of the flats he had examined, for many servants never saw the sky unless they went outside. As to air shafts, it was possible to plan them in such a way as to provide a tunnel—or a wide opening forming a corridor, or simply a ventilating duct at the bottom—so that there should be air passing from outside the building through the air-shaft; and if that were provided the architect would ease his conscience in regard to the circulation of air, as it was almost certain that a shaft with an inlet at the bottom would produce an upcurrent, and it was not the fault of the architect if the first manager of the place suggested a screen to go across the entrance—and this was often what an architect had to contend against. The architects' plans in that respect were often defeated by one man who insisted on stopping a draught that was annoying to him, though in so doing he made the other occupants suffer. A rather important point in regard to flats was as to the vertical division of them. An architect might plan his building with the utmost care, and with the object of suiting the requirements of the average mortal, only to find how varying were the requirements of the average mortal. One man wanted a large, and another a small, room; or one wanted four and another six rooms. In these circumstances it was convenient to construct the building in such a way as to make it easy to remove the partitions so as to make one large room, or to put partitions in so as to make small rooms. As to two-storied flats, he was glad that Mr. Hoffmann had referred to the interesting buildings by Mr. Norman Shaw. A simple arrangement by which the occupant of a flat could get into the open air was by means of balconies, not widely extending balconies, but those which extended far enough to enable a chair to be placed outside the French casement. It added greatly to the interest of such a place to be able to look down a street from such a position.

Mr. C. J. C. Pawley said he agreed that the best way to find out how to plan and arrange a flat was to live in one. In his opinion there would be a great development of the flat in London. In fact, already there was a great demand for such buildings, and architects should devote their attention to the subject. The first obstacle an architect of flats had to contend against was that of ancient lights, while another drawback had been the difficulty in getting financial people to find the money for the erection, though that difficulty was to an extent overcome in London owing to the great life and fire offices regarding such property as good investment and advancing sums of money on it. As to the ventilation of flats he had found it a good plan to have the

entrance doorways to rooms carried up to ceilings, and to have a fanlight with an opening gear worked from the lower part of the sash, and with a cord for the purpose of regulating the ventilation. He thought that Mr. Halls' observations with regard to large doors and windows were useful, especially in regard to the design of such buildings in London, where one could not have too much light. As to the doors, in many places the opening was so small that when furniture was moved about, both it and the doors were damaged. As to the aspect of flats, if Mr. Hooper visited some flats that he (the speaker) was acquainted with he would see from the buildings plenty of sky and sunshine and greenery. He did not think that any room in an ordinary flat should be less than 10 ft. from floor to ceiling. He thought it very important in such buildings to have roofs for promenade, and at St. James's Court there was a winter garden for the eight blocks and also provision for any tenant to go on to the roof for a walk. As to smoke, he thought they should do all they could to do away with the smoke in London, and in his opinion much could be done by advocating the use of gas fires which, in his opinion, would be the fires of the future for flats, especially in dwelling rooms. They knew the disadvantage of gas fires, but great improvements had been made recently. He regretted that there were no illustrations of American flats and that the American buildings had not been referred to. People in this country could not go quite as far as Americans, but we might with advantage adopt some of their improvements. As to removable partitions, he had used quite a new material for the purpose, viz., pumice stone made in blocks and imported from Germany, and he thought the material had a future before it. Of course, the material could only be used where there was no weight to be carried, but the blocks had this advantage—they were exceedingly light, plaster adhered to them, and they could be very easily cut, and for these reasons they were suitable as partitions in flats. He believed in the use of balconies in such buildings.

Mr. G. B. Carvill referred to the paragraph in Mr. Hall's paper relating to the solid wood fireproof floor patented by Mr. Evans. He (the speaker) had often wondered why the floor had not been a success, for it seemed to him to be a very good thing, and he had seen it used in two or three buildings, but not for the last five or six years. Perhaps one drawback to its use was that the timber had to be very dry when it was first put in, and unless the roof was on there was always the chance of rain coming in. Moreover, the expansion of very dry timber in such circumstances would exert a thrust on the walls.

Mr. A. T. Bolton said he did not think there would be the rapid development in the erection of flats that had been predicted, and for the following reasons. Although it was true that much of the centre of London would be rebuilt as flats, still the tendency of the day, aided by rapid means of locomotion, was for people to reside in the country. This was true not only of London, but of all great towns, and he had been very much struck by the fact in Dublin, and also in Leeds and Birmingham; therefore, although there might be great activity in the building of flats in places like Mayfair and Westminster, it did not follow that the introduction of flats was going to change the habits of a people. He thought there was no comparison in the advantage to a nation as between a people that dwell in houses and one that lived in flats. Consequently, there was a great deal more in the question than the purely architectural point of flats affording opportunities of larger, more expensive, and therefore, in a way, more important buildings. It would be a bad day for the country when an Englishman's house ceased to be a castle and became a flat. He had been over a good many flats, and he thought, observing the dark corridors and miserable outlooks, that the inhabitants of these highly-priced flats could have done incomparably better, with much more comfort, for the same or less money. It seriously affected family life also, for great as might be the attractions of such buildings to newly-married people, they would discover that their company would later on become undesirable to residents who were not fond of children. This question he had seen discussed in connexion with the Peabody Buildings, and in his opinion there was a tendency for people after some trial to remove from flats and to take a house. He

sympathised strongly with Dr. Sykes in some of his remarks, and he thought that in the case of infectious diseases the desire of a doctor who cared about his patient would be to remove at the earliest possible moment the patient from such buildings. Not only in the ordinary infectious cases, but also in subtle cases like influenza and in the many cases where quiet was required, flats were exceedingly detrimental. As to lifts, it was no doubt more pleasant to be at the top of these buildings, but the possibility of living there depended to a large extent on the accessibility of the apartments; there were certain hours when the lifts would not be available. He had seen something of the flat question in France, where the commonest complaint against life in such buildings was the automatic and arbitrary rule of the *concierge*. The *conciergerie* was described as a centre of gossip, and the tyranny of the *concierge* was a by-word in France; and it might be asked in that respect, whether the liveried porters in England were a source of trouble. A man certainly was not so much his own master in a block of flats as he was when he occupied a house of his own; and the idea that it was at any moment possible to lock up for a time one's apartments in a flat and send the servants off was a delusion. Servants could not be given holidays at any moment, and the real way to enjoy life in a flat was to do without servants. The non-self-contained flat, or the residential hotel, had been alluded to, and had been spoken of as presenting many advantages over the ordinary flat. For instance, people who love company were attracted to this mode of life, and many of these residential hotels provided splendid dining and other rooms where company could be found at all times. That class of flat was quite as likely as the ordinary self-contained flat to be the flat of the future. Mr. Hall had referred to the question of elliptical and circular staircases, and had said he preferred to have a landing. A landing was ruinous to the effect of a circular or elliptical staircase, the whole beauty of which consisted in an unbroken wreath, and if a landing were introduced the effect was spoiled. In that respect the French showed great taste, for when they indulged in that class of staircase they kept it unbroken from one floor to another. As, however, a block of flats was, in a sense, a public building, it was a question whether winding steps could or ought to be introduced. They would all feel indebted to the suggestion as to putting down linoleum on concrete without intervening boards, and he had heard of the same thing being done with cork carpet—the carpet being glued down; but he was not sure how far that excluded the noise. As to suspended ceilings, the difficulty was that there was a tendency to cut floors fine in depth in order to save in the total height, and it would be difficult to save space with a suspended ceiling. A solid 9-in. concrete floor with a suspended ceiling underneath meant a 12-in. floor. He did not quite agree with Mr. Hall that 7 ft. by 10 ft. was too small for a bedroom in the case of a house. It all depended upon what arrangements were made for ventilation. Many people would rather have five small rooms than four slightly larger in size; and provided that windows could be opened and that there were fireplaces provided, there was a great deal to be said for the small room. The best side of the flat system was that it taught a lesson of economy of space, and house planning would be improved in detail as a consequence.

The Chairman, in putting the vote of thanks to the meeting, said they were indebted to Mr. Hall for the great amount of trouble he had taken in the preparation of his paper. As to the development of the flat system, there seemed every probability of its further development in London, and he was of opinion that that was due in part to the enormous increase of visitors to London and not so much because of a demand by English people for that style of dwelling. Visitors came from the provinces and from abroad just for a season, and it was convenient to be able to take a flat for three months. He was much struck with Mr. Hall's remark that there were practically no flats in our great provincial cities. There was a very interesting article in one of the magazines suggesting that Englishmen were becoming a nation of entertainers, and the writer illustrated his remarks by reference to the enormous expansion of the hotel and flat system in London. As to the objection to flat life in consequence of the noise

of adjoining occupants, there was no difficulty in preventing it vertically, but horizontally it seemed almost impossible to stop it where there were families of inconsiderate people who thought of no one but themselves. He suggested that in constructing flats a small strip of felt nailed on the top of the joist carrying the wood floor would deaden sound. The question of the disposal of dust had not been referred to, but he might say that he did not think that the dust shoots which had been introduced into some of these buildings, were at all satisfactory. As to the great open court in the middle of these buildings it was not popular in England. The Latin plan had not taken root here for several reasons. He did not know whether a main ventilating duct had been tried and an air-shaft with electric fans. Perhaps that arrangement would establish sufficient up-current, though the expense and the draught might tell against it. It would be interesting to know whether electric fires had been tried. He very much doubted whether gas fires would take the place of coal as had been suggested, but he thought that some system of electric warming could be adopted with advantage. With the vote of thanks he wished to couple the names of their foreign and English colleagues who had supplied them with so many interesting illustrations.

The vote of thanks having been put to the meeting and heartily agreed to,

Mr. Hall, in reply, said they would all agree with Dr. Sykes as to the importance of making flats sanitary. If they were not sanitary they would not last, and it went without saying that architects intended to pay attention to sanitary points. As to smoky chimneys, his impression was that it was almost impossible to get a domestic flue 60 or 70 ft. long that would not smoke. The fires on one or two floors would be all right, but that was not the case with those on the lower floors, for a column of air which left the ground floor warm ceased to be warm as it ascended, and then did not rise, and the heavier air forced it down again. Rooms and corridors, of course, must be ventilated, and it was not difficult to do that. He introduced inlet and outlet ventilators as well as windows in all rooms, but what was really more important, residents should be encouraged to use them. He quite agreed with Mr. Hooper's objections to servants' staircases. It was not desirable to introduce the servants' staircase unless it were put close to the principal one, and there were objections to that on other grounds. As to removable partitions, it was his practice to build only the main walls, and to let partitions in flats or similar structures be carried on the floor itself, so as to make it easy to take them down if desired. Balconies were pleasing additions, but there was the danger, unless they were rather high, of people falling over them; and when this danger had been provided against, people could not see over them. He did not suppose that the private house would be given up in the future, or that an increasing number of people would not go to live in the suburbs; but out of a population of four millions a considerable and increasing number would prefer to live in towns, and flats were taken because ground for houses of equal area could not be obtained at an equal rent. He thought it wrong and selfish for people who had children to live in flats—wrong for the children, he meant. Children should not be brought up where there were no facilities for running and playing about, and consequently life in flats was deleterious to the health of children. He joined issue with Mr. Bolton when that gentleman said that flats were unhealthy. Quite the contrary was the fact, as Peabody statistics showed. [Mr. Bolton: A selected class.] They were not superior, so far as their habits were concerned, and therefore, not class under discussion, and he felt certain that the health of persons living in flats, assuming those flats to be built with some degree of sanitary fitness, would be superior to that of people living in the same district in ordinary houses of like accommodation. [Mr. Bolton: In all the Peabody buildings there is a large amount of supervision.] But supervision did not prevent a man dying. He had never heard of a private flat not being kept as clean as a private house (and he could not imagine things being different), nor of people altering their habits because they lived in flats. As to the prevention of noise, he thought that the suggestion as to felt was a good one, but he feared the felt might rot. Boards, when covered with linoleum, rotted

unless they were ventilated, and that was why he had given up using wooden floors. He had a case (it was not one of his own designs) in connexion with a twelve-year-old building where the 3 in. by 2 in. joists laid on concrete had been covered with linoleum, and about every three years a new floor had to be put in. The floor was unventilated, and the rotting was probably due to moisture which had got in at the time the building was erected. As to the size of rooms, no room for sleeping purposes should have less than 1,000 cubic ft. of space. It was all very well to say one could economise space, but a person needed a sufficiency of cubic space to breathe in. One could live tolerably comfortably in a cabin on board ship, because the port holes admitted plenty of pure air. In London, where the air was frequently stagnant, something had to be done to make the air move, and this was done by ventilation. The first thing a doctor did for a patient was to insist on his sleeping in a room with not less than 1,500 ft. of cubic air, and if a considerable cubic space was necessary for a sick person, it must be desirable for a person in health. People must have an adequate breathing space. As to dust-shoots, he hoped that no one would use such things as vertical dust-shoots in a flat, for they were abominable things. What were required were sanitary receptacles like galvanised iron pails with lids, and these should be collected every day. He would have much pleasure in conveying the vote of thanks to those gentlemen who had kindly lent them drawings for the occasion.

The Chairman announced that the next meeting would be held on February 1, when Mr. D. T. Fyfe would read a paper on "Architecture in Crete and Turkey."

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

PROPOSED FORMATION AT BELFAST OF A BRANCH OF THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—A meeting of the architects of the city was held at Belfast Town Hall on the 15th inst., for the purpose of considering the advisability of forming a branch of the Royal Institute of Architects, Ireland. On the motion of Mr. Close, seconded by Mr. J. C. Lepper, Sir Thomas Drew was moved to the chair. The chairman said it gave him great pleasure to see such a large number of the members of the profession present. When the desire was expressed that a movement of that kind should be set on foot, it was thought that he, as President of the Royal Institute of the Architects of Ireland, should summon the members to meet him in Belfast. As the local representative of the Royal Institute of British Architects in London, he thought he could go further, and summon the members of that Institute. Other members of the profession had also been invited by the secretary to be present.—It was agreed that Mr. Fitzsimons be appointed secretary of the meeting.—The Chairman, in giving a statement of the objects of that meeting, said that as a native of Belfast he was pretty well aware of the difficulties to be met in the formation of a co-operative society. His forty years' experience in Dublin had also taught him the enormous advantages and good fellowship which was engendered by cohesion amongst the members of the profession. He had heard it said that it would be impossible to form a cohesive society in Belfast. He was perfectly well aware of the difficulties, but he thought those difficulties were not insuperable. One of the great difficulties in bringing about unanimity of practice in the city was the question of fees. He knew the position in Belfast was very different from that in many other towns, and differed in toto in respect to the class of buildings to be erected. There were buildings here of the warehouse class, and rows of houses in a growing town, and it was unjust and unreasonable to lay down a hard-and-fast scale of fees. Sir Thomas then went on to speak of the unsatisfactory condition of affairs amongst the architects when he first went to Dublin. There was little cohesion, and the members had very old-fashioned and evil notions, but since that time a better state of things had been brought about. Instead of the proper percentage being paid to architects, half, and sometimes less, was paid, but since that time the old system had died out, and now the architects were working together on terms of the most perfect harmony and understanding.

There was no architect who was in any difficulty but the other members of his profession came around him and supported him. He was quite sure that that society would strengthen all its members by co-operation, but he did not think at present there should be any very stringent rules laid down as to professional conduct in the way of declaration. It was quite premature to ask intending members to be members of the Institute in Dublin, but in many ways it was desirable that the local society should be affiliated to that Institute. It should be open to their members to become members of that Institute or not, just as they chose, just as their society would join with the British Architects' Institute. Their society would be simply to watch over the interests of all architects.—Mr. W. J. Fennell moved the following resolution:—

"That, having regard to the lack of organisation of the architectural profession in Ulster, it is desirable that an association be formed, having for its objects the promotion of union and professional integrity amongst its members, the establishment, as far as possible, of uniformity of practice, and the general advancement of architecture; to consist of Fellows and Associates of the Royal Institute of British Architects, and members of the Royal Institute of Architects, Ireland, together with such other competent members of the profession as may desire admission, and be elected subsequently under a constitution and by-laws, which shall be framed by a council elected for that purpose and approved of by a majority of the members; that the constitution and by-laws be subject to the approval of the Royal Institute of Architects, Ireland, and the association so formed be affiliated thereto and have official representation on its council."

After expressing his pleasure in being asked to fulfil that duty, he said there was no organisation at all in Belfast, and he thought it was a step in the right direction to form one. The objects were, first, the promotion of union, and in regard to that he thought there was exceedingly little union among architects in Belfast. At any rate, he had seen very little of it in his twenty-five years' experience. The last paragraph was a most important one, and it was to the effect that their branch must be affiliated to the Royal Institute of Ireland, and have representation on the council. That he considered most important. Such action would lead to a better and higher standard of practice, and it would be of great benefit to the members of the profession in Belfast and to the general public.—Mr. J. Gilliland seconded the motion, and said the necessity was great, because London was very far away, and Dublin not very near. It was impossible for the members to keep in touch with those centres, and as those centres had no local knowledge, it was necessary to deal with local questions and to discuss matters among themselves. Union in Belfast had been conspicuous by its absence, and disunion would be the more proper term to apply to it.—Mr. W. Kaye-Parry said it was a great honour to be permitted to support the resolution, and to be associated with the movement inaugurated that day. The resolution was then adopted.—Mr. S. P. Close then moved:—

"That a provisional committee be elected to prepare a scheme and report to a general meeting, correspond with the Royal Institute of Architects, Ireland, and take such other steps as it may consider desirable to promote the interests of the proposed association; that the following be the provisional committee:—Vincent Craig, F.R.I.B.A.; J. J. McDonnell, J.P., M.R.I.A.I.; Frederick H. Tulloch, A.R.I.B.A.; William J. Gilliland, M.R.I.A.I.; John C. Dewhurst, M.R.I.A.I.; Nicholas Fitzsimons, A.R.I.B.A., secretary and convener."

Mr. G. W. Crowe seconded. This motion was also carried unanimously. Mr. Jas. St. J. Phillips moved:—

"That this meeting hereby expresses its cordial approval of the resolution passed by the council of the Royal Institute of Architects, Ireland, at its meeting of the 7th inst., as follows:—The council of the Royal Institute of Architects of Ireland, having had the result of the Presbyterian Assembly Hall competition, Belfast, brought before them, are of opinion that the conduct of the Competition Committee in not following the usual and proper course of publishing the report of their assessor (which they understand was an open document), and in appointing as architects to the new building the firm who drew up the original very unsatisfactory conditions, is deserving of their condemnation as being absolutely opposed to the methods which should govern all fair and impartially conducted competitions. The council considered the proper course for the committee to have adopted was either to have given the work to the gentleman placed first by the assessor, in conjunction with a

consulting architect of experience, or else to have invited a fresh competition with more satisfactory conditions than the previous one."

Mr. Nicholas Fitzsimons seconded the motion. The Chairman, in putting the resolution to the meeting, said he could not do so as the assessor of the competition referred to without making some observation. The model in question was impossible, unsatisfactory, and distasteful, as were so many of the competitions in Belfast.—The resolution upon being put to the meeting was adopted. Mr. Vincent Craig proposed a vote of thanks to Sir Thomas Drew, President, and Mr. W. Kaye-Parry, secretary, of the Royal Institute of Architects, Ireland, for their action in calling the members together, the cordial interest and sympathy they had shown in local professional interests, and for their attendance that day. Mr. F. H. Tulloch seconded the motion, which was carried unanimously, and the chairman replied.

ARCHAEOLOGICAL SOCIETIES.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—At the meeting on Wednesday, January 16, Dr. W. de Gray Birch in the chair, the Rev. H. J. D. Astley, hon. editorial secretary, read some notes contributed by Mr. L. D. Jones, of Bangor, upon "Yr Eglwys Wen" (The White Church), as the remains of rubble walling, blocks of quartz, and slabs of rough stone are locally called. These remains are situated between seven and eight miles from Bala, and form a rectangular level space, 45 ft. by 15 ft. Mr. Jones submitted carefully drawn plans and maps of the locality to illustrate his notes, and also sent some fragments of pottery, charcoal, and contents of an earthen vessel, which were discovered in the centre of the area, about 12 in. beneath the surface. It is proposed to undertake a thoroughly systematic exploration of the site later on, in order to determine, if possible, the nature of buildings which seemingly originally existed on this spot. Dr. Winstone exhibited, on behalf of Mr. Fry, a seal found in an excavation at Dover, 6 ft. below the surface. The seal is finely cut and exhibits a portrait of a young man resembling Sir Walter Raleigh, and may be a conventional portrait of that worthy, but it was considered of later date than his time. An interesting paper was also read by Mr. Patrick, contributed by Dr. Fryer, upon "Norman Fonts in North-East Cornwall." These fonts form a group of nine in the parishes of Altarnon, Callington, Jacobstow, Landrake, Lancoast, Launceston, Lezant, Lawhitton, and Warbstow. They are all of the transitional Norman period, and very much resemble one another, both in design and workmanship, and are particularly interesting as affording further evidence of the existence of a band or a school, or perhaps a guild of carvers and masons. In the discussion following the paper Mr. Gould drew attention to the ordinance directing the locking of fonts, which was enacted in Stephen's reign, and asked for information. This was not in force, he thought, for many years, but was seemingly re-enacted at a later period, as he knew of some instances in which the locking was apparently continued to the fourteenth century. The hon. secretary announced that, upon the invitation of the Mayor and Corporation, the Congress this year will be held at Newcastle-on-Tyne.

COMPETITIONS.

SEWAGE SYSTEM, FALMOUTH.—In a competition for a new sewage system at Falmouth, the scheme of Messrs. Richardson & Le Maître, East Parade-chambers, Leeds, has been selected. The scheme placed second was by Messrs. Pollard & Tingle, 31, Old Queen-street, Westminster, S.W.; and the third was by Messrs. Richardson & Le Maître, East Parade-chambers, Leeds.

EXTENSION OF ABERDEEN FISH MARKET.—The extension of this market has now been finished. The new buildings are 50 ft. wide and run along South Market-street for a distance of 430 ft., the wall along the street being constructed of red Ruabon brick, the inside being laid with brown glazed Ruabon brick so as to permit thorough flushing. At the junction of the old and new markets a new block containing telegraph and officials' office, restaurant, &c., and measuring 93 ft. by 50 ft., has been erected. The total cost is about 5,000l., and Mr. R. G. Wilson, Aberdeen, was architect.

Illustrations.

VIEWS AND PLANS OF APARTMENT HOUSES.

OUR illustrations this week are all selected from those which accompanied Mr. E. T. Hall's valuable paper on "Flats" at the Architectural Association, printed on another page. We have devoted our plates entirely to this subject, not only in order to illustrate Mr. Hall's paper as fully as our space allows, but also because Mr. Hall has obtained for this occasion many drawings and photographs of foreign buildings of this class, which are not always easily to be had.

The illustrations of exterior architectural treatment are all from Vienna, a city in which a great deal of careful and sometimes rather novel design is expended on the architecture of apartment houses. Professor Deininger's "Romahof" building, as will be recognised, contains a good deal of original and effective treatment of decorative detail. The house on the Stefansplatz, by Messrs. Fellner & Helmer, is of more ordinary type of detail, and unfortunately stands on glass, but apart from this it is a fine and effective street building.

The second sheet shows examples of some of the surface decorations introduced on the front of Viennese houses, partly in tiles, partly in modelled stucco. We may think it a little overdone and wanting in reticence, but at all events it has, to English eyes, the interest of novelty.

The third sheet contains three German plans; the large triangular plan is traced from an original working drawing of the architect (Herr König), which was so covered with figures as to be barely intelligible in its original form. Unfortunately the names of the rooms were not given on the plan, so that they can only be guessed at; but we may say that it is a building of which a portion, commencing from the first floor, forms a private mansion; the outer portions of the ground floor are evidently intended to be let as shops; and the remainder of the building is an apartment house. In the smaller-scale plan of the Leon-Wernburg palace on the same sheet, we may point out the ingenious and effective plan of the rooms in the right-hand angle, whereby the difficulty of an irregular site has been made the occasion for giving a new interest to the plan. All these three plans are, we think, very suggestive in regard to the treatment of buildings of this class on irregularly shaped sites; it is for that reason that we have grouped them together.

The plans on the fourth sheet are chiefly Parisian, with one English example, and they mostly deal with more regular sites and more symmetrical planning. M. Nerrot's building in the Boulevard St. Michel is a fine example of a Paris house of this kind on a great scale, with its garden courts. M. Rives' small house in the Rue du Château d'Eau is an example of the manner in which the French succeed in packing the required rooms into a limited space, with a small internal area for light. The position of the water-closet, facing the end of the passage and with no window, will seem almost scandalous to English architects; it is possible that the absence of any window may be a mistake in the engraving from which the plan was taken, but this does not by any means follow; French architects are still quite capable of this kind of insanitary arrangement, and their clients, moreover, are quite satisfied with it.

BUILDING CONTRACTS FROM A BUILDER'S POINT OF VIEW.*

In the olden days it was, as you know, the custom for the architect personally to superintend the erection of his own work, and so now, if perfect work is to be produced, it is essential that the architect and builder should be in sympathy one with the other, so that the true spirit of the design may be carried out. To ensure absolute perfection in workmanship, only approximate prices should be given, and the work executed upon a percentage upon cost basis, or at daywork prices. Either of these courses from a builder's standpoint may be considered ideal, and as such would not commend itself to the ordinary commercial proprietor, who, on the average, has far more consideration for his pocket than for architect-

ural effect. There can, however, I think be no doubt that in the majority of cases bad workmanship is the result of low prices and strained relations between architect and builder, and when this fact is fully realised, and architects make up their minds to minimise competition to fair and reasonable proportions, and also make the conditions under which the builder has to work as easy and comfortable as possible, then, I think, they will find very little cause to complain either as to the quality of the workmanship or the manner in which it is executed.

To a builder the two most important factors in connexion with building contracts are the conditions or form of contract, and the bill of quantities. If the former is fair and reasonable and the latter correct and explicit, he may (should he know his business), with ordinary luck, rely upon getting through his work without losing any money, and if the conditions under which the contract is taken happen to be favourable and the competition not too keen, he may make a profit. Losses on contracts outside those occasioned by sheer misfortune, can, in nearly all instances, be traced to certain causes, and in the majority of cases these are (1) misconception of the conditions of contract, whereby you contract to carry out considerably more than you bargained for; or (2) inexplicitness on the part of the quantity surveyor. Speaking in this connexion, cases have come to my own knowledge where surveyors have been instructed in certain instances to make their quantities as inexplicit as possible, with a view to deceiving the competitors, and so keeping down the amount of the tender. I am pleased, however, to say, in the instances referred to, that the surveyors did not follow their instructions. With regard to the form of contract, for my own part I much prefer a sheet of notepaper saying that I am prepared to do certain work for a certain sum, to an architect's satisfaction, and specifying the terms of payment. It is obvious, however, that in a large number of cases, and with most people, this course would be unwise, and that a properly drawn form of contract is preferable, setting forth in precise terms what is agreed upon. Originally these contracts were drawn on behalf of the building owner by his solicitor, paid, I presume, so much per folio; the innocent builder of the days of our youth, confiding as a child, would not employ a solicitor to look after his interests, and being anxious to get the work would sign anything he was asked. As a consequence we have handed down to us forms of contract, which, I think I am safe in saying, many of us have signed without reading, and even if read, not understood, and which, if we had been legally held to them, would have resulted in our seeking fresh woods and pastures new. In recent years, however, this is changed, and although we are continually being asked to sign many different forms of contract, there is rarely much trouble in getting architects to see that there are two sides to every question, and that the builder is every bit as much in need of protection as the building owner. It is extremely rare for any contract now to be put before a builder which does not contain an arbitration clause, and yet fifteen or twenty years ago any man that asked for such a thing was regarded as a dangerous individual. It is strange that builders should have for such a long time existed without such a clause, and this may well be regarded as an example of their easy and tractable nature. All other contracts between business men invariably contain it, and, to my mind, in the building trade, with its many complications, it is all the more necessary, and as much from the employer's point of view as the builder's. The general impression seems to have been that unless the builder was entirely in the power of the architect, disputes would constantly be arising. Time, however, has proved differently, and as the insertion of the clause protects builders from unprincipled architects or so-called architects, it has also the effect of causing the exercise of more care on the part of employers and architects in the conduct of their works.

There are many different forms of contract, but those in most general use are that agreed upon by the Royal Institute of British Architects and the National Association of Master Builders, and also that issued by the Royal Institute of British Architects. Both of these are a most distinct improvement on those in use before they were issued, and are very similar to the one to the other. The former one has

since been objected to by the Royal Institute of British Architects, and has resulted in the issue, by them, of the latter. The difficulty arose over, I believe, the arbitration clause. In the original contract, in the event of any dispute arising, either party might immediately proceed to arbitration whilst the works were in progress. This was objected to, and in the form issued by the Royal Institute of British Architects, the following clause is inserted:—"Such reference, except on the question of certificate, shall not be opened until after the completion, or alleged completion, of the works, unless with the written consent of the employer or architect and the contractor." From my point of view, the clause in the original contract is much preferable; to a builder upon a large contract, dealing with men with whom he is practically unacquainted, it appears to me to be most vital. In the event of a dispute occurring in connexion with extra depths or other works to foundations, involving the expenditure by the builder of some thousands of pounds, if he is unable to get the matter settled as he proceeds, he may have it hanging over his head for three or four years, until all the circumstances are forgotten, and during which time he is also being kept out of his money. On the other hand, the argument may be raised that a contentious builder might start arbitrating at the commencement of a contract and go on arbitrating until the finish. This is a case which I do not think would ever occur, and in this my opinion is confirmed from my experience of the working of the arbitration clause. With this exception I would be prepared to agree to either form, both of which can only have been compiled after much careful thought and expenditure of time.

Much difficulty is, as a rule, experienced in dealing with Urban and Municipal Councils in connexion with forms of contract, they often requiring conditions much more drastic and arbitrary than any other body. They, however, are gradually learning wisdom, and when they find, as they often do, that respectable firms will not agree to their conditions, they are prepared to modify them. Doubtless the course they adopt is taken in self-defence, and if such a course is really necessary, and is founded on experience, they have my sincerest sympathy.

The forms of contract issued by the War Department, Admiralty, and Board of Works, are also fair and reasonable, and in many cases their terms of payment are more favourable.

Many architects adopt forms of their own. These, experience has taught me to be careful of, and always, if possible, avoid signing. With two such forms as those already referred to there is no necessity to go any further.

Speaking of forms of contract generally, the principal points the builder has to consider are (1) time clause; (2) terms of payment; (3) inability of proprietor to pay; (4) liability for acts of other persons or things; (5) maintenance clause; (6) arbitration clause.

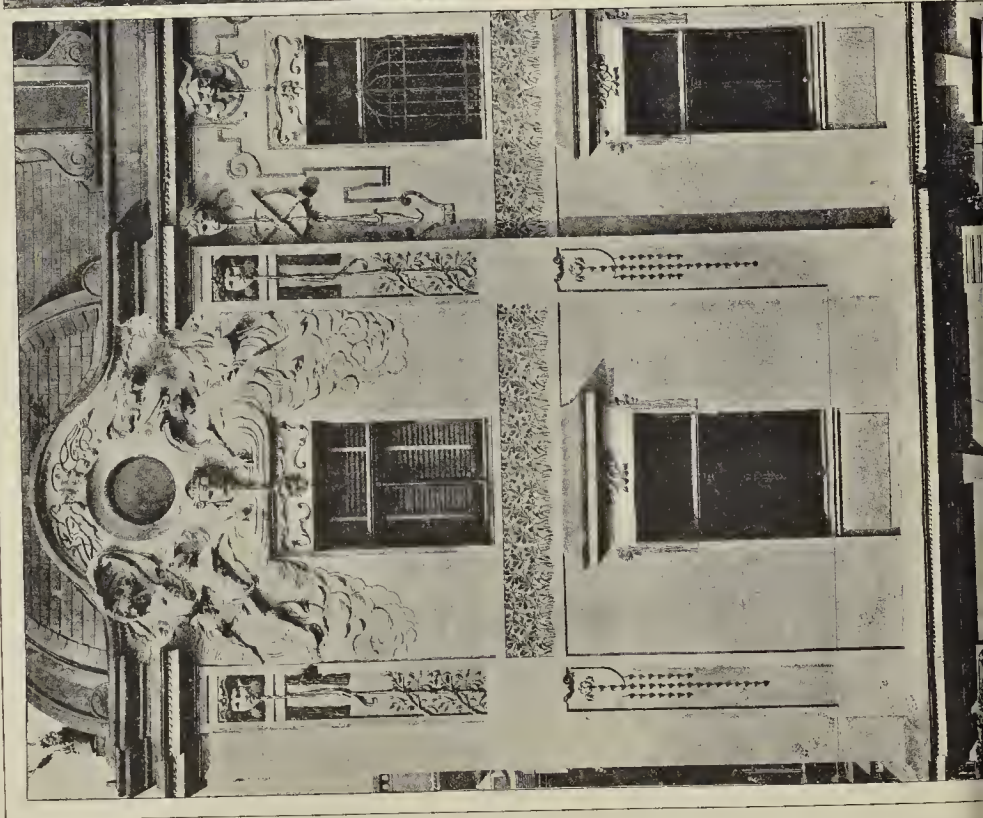
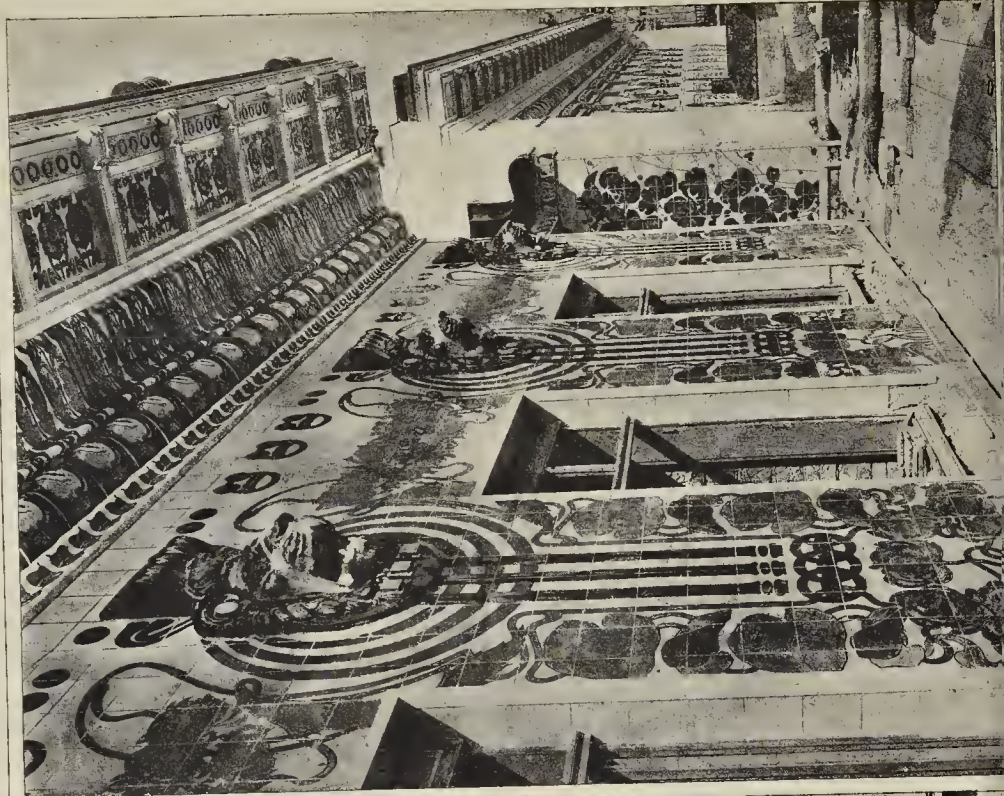
As to the time clause. In the majority of cases this is more honoured in the breach than the observance, and for the reason that the time is named without thought, and in most instances is altogether inadequate. Considerable dissatisfaction is caused to the proprietor who cannot understand reasons for delay, and is therefore most anxious to get from the contractor damages to which he is not entitled. It is most decidedly to a contractor's interest to get his work done as quickly as possible; and for the benefit of all concerned a reasonable time should be appointed in which the work can fairly be executed, and to this both the contractor and the architect should be held, delays in many instances arising as much from dilatoriness on the part of the architect as on the part of the contractor.

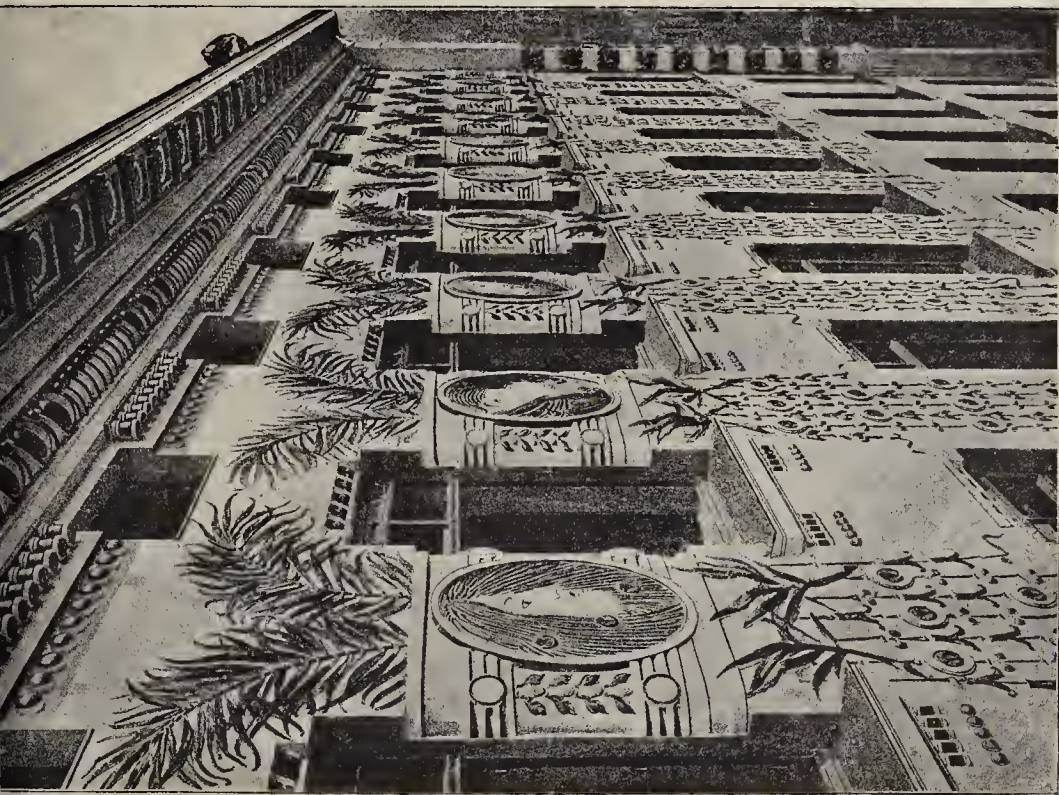
In reference to the terms of payment. From time immemorial it has been usual to pay eighty per cent. on the value of the work executed and fixed in its place. Since this arrangement was instituted the times have considerably altered, and it is impossible for a builder now to obtain the same terms from merchants and manufacturers that he got eight or ten years ago. Then, it was usual to be allowed on most goods four or six months' credit, and on timber six months, whilst in several cases twelve months' accounts were allowed. Now all timber, iron, stone, bricks, and, in fact, by far the largest portion of the materials used in a building, have to be paid for in a month following delivery, whilst in a few favoured

* A paper read by Mr. Frank Cowlin before the Bristol Society of Architects on the 14th inst.

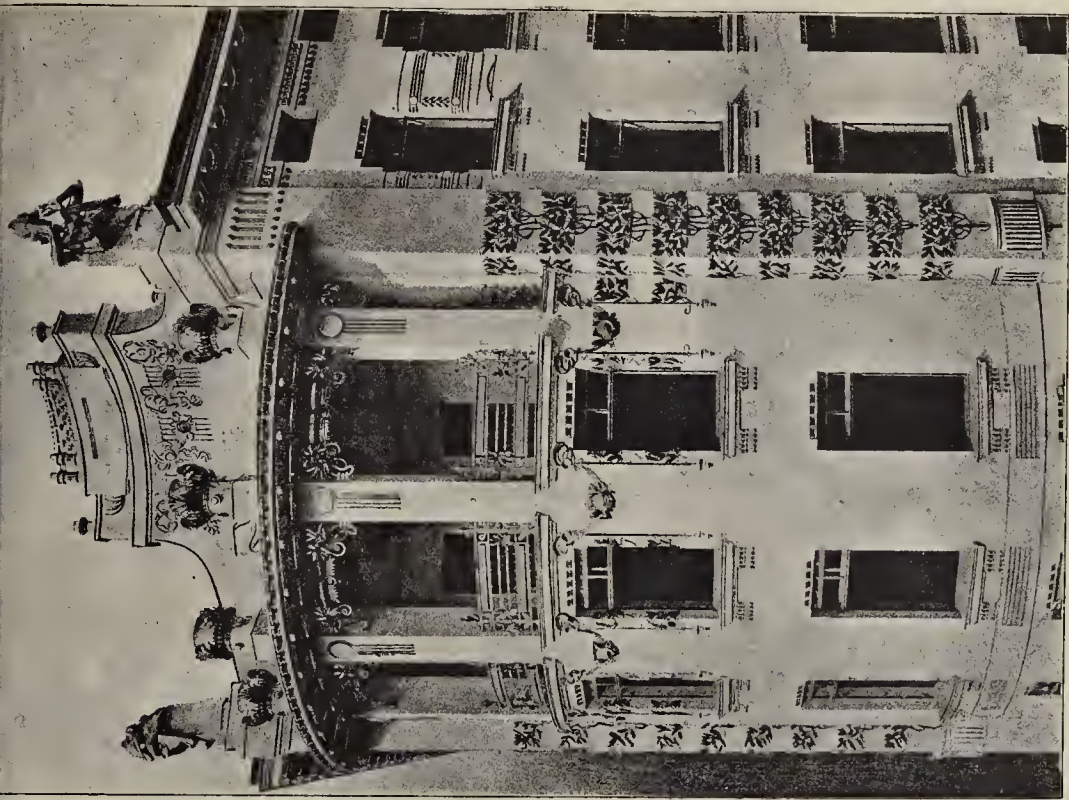
DECORATIVE TREATMENT OF APARTMENT HOUSES

THE BUILDER, JANUARY 26, 1901





HOUSE AT VIENNA. FRONT AND ANGLE (PROFESSOR WAGNER).



INK PHOTO SPRAGUE & CO. L^Y 4 & S. EAST HANING STREET, PETER LANE, E.C.

DECORATIVE TREATMENT OF APARTMENT HOUSES

cases a three months' account is allowed. This, you see, means practically a cash business, so that it is impossible to carry on anything like a large establishment on the old conditions. According to the terms of all contracts, all materials delivered on the ground become the property of the proprietor, and therefore they should be taken into consideration when the certificate is granted, and payment should be made on account of them. This you may say is liable to abuse in the case of a shabby builder, but by the exercise of some care and tact on the part of the clerk of works and architect in the granting of certificates, I fail to see how any difficulty can arise, and in any case the proprietor is protected as he has the goods, and also the margin of the reserve. With regard to the percentage to be paid, this should, I think, be increased to 90 per cent. If 80 per cent. was the standard twenty years ago, the manifest change in the conditions of trade since and the increase in competition and decrease in profits, fully justifies one in asking for the 90 per cent. Wages have to be paid weekly, and form, roughly speaking, 50 per cent. of a builder's turnover, and this, with the shortened terms of credit, make it most difficult to finance a builder's business; so much so, that no matter how profitable a business you may be transacting, you find it impossible to get on without borrowing from your bankers, for which luxury you have to pay pretty dearly.

As to the amount of the reserve. This, of course, varies with the amount of the contract, but for contracts up to 10,000l., 10 per cent. is, I think, now a generally accepted amount. Beyond that sum, it is a matter of arrangement. Personally I fail to see the necessity of a large reserve or the need of retaining it for any length of time. Much, of course, depends upon the character of the builder, but in ordinary cases I think it is fair to pay half the reserve at the completion and the remainder at the settlement of the accounts, retaining some nominal sum for a further period of three months, sufficient to make good any defects that might occur in that time. Such an arrangement as this would be an incentive to builders to get their accounts squared up quickly, and much inconvenience and trouble to architects would be saved.

The next clause of importance is one which should make the proprietor liable to pay within a reasonable time after the deposit of the certificate. This is a point which is a very sore one with builders. They are expected to perform their part of the contract, but it is not at all unusual to find that after having obtained (may be, after considerable trouble) a certificate for a payment on account, it takes a further four or five weeks to obtain payment. A clause to protect builders in such cases should be introduced in all contracts, as I am glad to say it is in the forms issued by the builders and the Royal Institute of British Architects. Much trouble and annoyance would be saved also if a clause were inserted whereby payments are to be made at stated intervals, no matter how small or great, then the proprietor would be prepared to meet the certificates as they are presented. The next clause I wish to touch upon is one making the contractor liable for any loss or damage whatsoever to the premises from whatever cause arising and until the expiration of the term of maintenance, and is often introduced into contracts other than those I have mentioned. The contractors' liability should cease, as far as loss or damage is concerned, when the buildings are completed and handed over. The maintenance clause I have already touched upon. It is one in which a great deal is left to an architect to decide, and when he happens to be weak and the proprietor is strong the position of the builder is uncomfortable.

There are two clauses in a form of contract drawn up and used by an eminent firm of architects which are I think worthy of your consideration. The first is the reference clause, which is as follows:—

"The architects shall, during the progress of the works, have the powers above described, and shall be the sole judges in all matters relating thereto as to the interpretation of the drawings and specification as to the execution, condition, and extent of the work from time to time actually executed, as to the quality of the materials used, or to be used in and about the several works, and as to the degree of despatch with which the works should be conducted and carried on, and in all matters of account connected therewith, and as to any question which may arise as to the progress and conduct of the works or deviation from the specification and drawing, and in respect thereof, their decision shall be final. But

in case after the building shall be completed any dispute or difference shall arise between the employer or the architects on his behalf, and the contractor in respect of the contract or of anything connected therewith or relating thereto or to any additional works or variations thereon or as to what addition, if any, ought in fairness to be made to the amount payable to the contractor by reason of the works having been delayed through no default of the contractor or by reason or on account of any directions or requisitions of the architects, involving increased cost to the contractor beyond the cost properly attending the works according to the true intent and meaning of the signed drawings and specification or as to the construction of these presents, such difference shall be referred to the arbitration of —"

The point I particularly wish to refer to is that portion which says, "or as to what addition, if any, ought in fairness to be made to the amount payable to the contractor by reason of the works having been delayed through no default of the contractor or by reason or on account of any directions or requisitions of the architects involving increased cost to the contractor beyond the cost properly attending the works executed according to the true intent of the signed drawings and specification."

Contractors are continually being put to considerable expense by the causes enumerated above, and although it must be patent to both architect and clerk of works that they are fairly entitled to it, I have only once in my own experience heard of an architect granting such a sum, except under pressure. It should be distinctly understood in such cases that a builder is to be paid what is fair and reasonable, and this should be left to the architect, and failing him, arbitration.

The second clause in the private form of contract referred to is as follows:—

"Notwithstanding anything hereinbefore contained the contractor shall not be responsible for the act, default, or omission of any other contractor employed by the employer in or about the execution of any of the works comprised on the specification or in or about the execution of any other works upon the site."

This speaks for itself, and I, speaking from very bitter experience, can testify to its importance.

This, gentleman, in brief, is all I have to say as to the conditions of contract, and I now come to what is just as important from a builder's point of view, and that is the question of quantities. In this connexion it is very pleasing to note that during the last few years there has been a most distinct improvement in the quality of the quantities supplied, and that the custom of allowing the surveyor to measure up for and settle all accounts is becoming more general. The advantages of this, from both sides of view, must, I think, be obvious; and whilst perhaps it may be more advantageous to a certain class of builder to settle accounts with an architect, who is not so well up in prices and variations as a fully qualified surveyor, it is to the benefit of the trade generally to leave the accounts in the hands of the latter; any profits made have then to be made on the basis of the prices quoted, and not on the basis of one's powers as a debater, to put it as mildly as possible.

A most important point in connexion with bills of quantities, and one upon which in this district there are many diversities of opinion, is the question as to whether they shall be the basis of the contract or not. Many builders I have spoken to upon the subject prefer that they should not, and that the custom generally prevailing here, of checking the quantities and then taking them as correct, is preferable. Personally, I cannot agree with them. It is not part of a builder's business to check quantities; and in a large contract it means a very great cost. In my opinion, it is not fair that a man should be paid for work he does not do, and in this system this is most invariably occurs.

It is usual for a builder in checking quantities to discover only items that are short or entirely omitted, and to get these allowed, whilst nothing is said about items that are full; and if a builder is of a particularly suave and persuasive nature, he is enabled to get more allowed him than he is fairly entitled to. A surveyor, if he knows his business, should be able, and is able, to take off quantities that are correct, and upon these the contract should be based. This is the system that obtains generally in London and the North of England, and is found to work satisfactorily. In many instances, notably in Government work, the quantities are guaranteed. This is practically

the same thing as making them the basis of the contract, and it speaks volumes for the character of their work that surveyors are prepared to do this even when the contract amounts run into several hundreds of thousands of pounds.

The main results of this system are:—1. A vast improvement in the quality of the quantities, a surveyor's reputation entirely depending upon their exactitude, whilst under the old system any mistakes might easily be covered up. 2. It has shown builders that a complete knowledge of the cost of their work is absolutely necessary, and this must tend to improve prices and the status of the trade generally. If a builder is only paid for exactly the amount of work carried out, it follows that his prices must be correct if he is to make a profit. He cannot assume, as one does at present, that the quantities will be full with one man and short with another. It reduces the speculative character of the business, and enables a firm to more fully trade upon their merits. It is the custom in Scotland to remeasure the work on completion, and pay at the original schedule rates. This, assuming the original schedule to be correct, is practically the same as making the quantities the basis of the contract, and this system is found to work satisfactorily, and is the outcome of previous experience.

The only argument, as far as I can see, that can be used against it is, that possibly, in the event of the quantities being incorrect, the building owner cannot tell exactly what he will have to pay for his work when he starts. This argument speaks little for the ability of the surveyors, and the contingency named is, I think, one which would very rarely occur.

The next question I would like to touch upon refers to prime cost sums and provisional amounts. Different surveyors have different ways of considering the term prime cost. It is usual to mention that it means net cost, and then the question naturally arises, what is net cost? Does it mean net cost to the contractor or net cost to the ordinary consumer, and this opens up the question of trade discounts, and then the trouble begins. It would, I think, be well if trade discounts could be altogether abolished. In tendering, you are told to add your profit, and this I usually make a point of doing. If there are a large number of prime cost amounts I usually lose the contract, which is obtained, perhaps, by a contractor of a more speculative nature, who does not add any profit at all, but who, in the settlement of accounts, does not divulge the net cost of the articles in question, and perhaps by pre-arrangement with the merchants supplying the goods, or by argument, or, to use a slang expression, "bluff," is enabled to obtain the trade discount, and in all probability obtains a larger percentage of profit than I should have added, and at the cost of the proprietor.

Many firms, especially when they quote the architect direct, refuse to allow any discount, or, if they do allow it, it is distinctly stated in their quotation, so that no misconception can arise.

It is fair to assume that a builder must make a profit on these amounts, and if it could be generally understood that all architects and surveyors would allow 10 or 15 per cent., or any stated percentage, upon the actual net cost to the builder, of the goods in question, and this sum were added by the surveyor in preparing the quantities, much discussion, misconception, and bad feeling would be done away with. We have lately tendered for a contract under Messrs. —, whose surveyors are Messrs. —, and in their conditions in reference to the prime cost amounts they have the following clause:—"The whole of the provisional sums and prices throughout are understood to bear a 10 per cent. discount to the contractor, and he is, it is understood, entitled to no further profit on these provisional amounts." This, to my mind, is a very good way of dealing with the difficulty, and as they also have a condition that the receipts for the various goods are to be produced if necessary, they are well protected against any unscrupulous contractor.

In one contract we are carrying out, the question of prime cost sums is dealt with as follows in the specification by special note:—

"Wherever the word 'provide' or 'prime cost' is used, the amounts thus mentioned are to be expended at the direction of the architects, and the architects may require the amounts thus mentioned to be paid by the contractor net to any tradesman

selected by them on their certificate, or such amounts may be certified on the proprietor direct and deducted at the settlement of the accounts."

In the quantities there is a special bill for provisional sums and works in connexion with them. As each sum is mentioned, so the discount upon it, if any, is given. At the end of the bill a clause is inserted which summarises the amounts in the following terms:—

"The total sum of the above provisional amounts is say, 4,000., of which part will be expended at contract rates or deducted at the settlement of accounts, and part is subject to discounts, as stated; but, as regards the sum of, say, 3,500., allow for all builder's profit and establishment charges," &c.

This, perhaps, in a large contract which contains a large number of provisional sums, is the best way of dealing with them. There can be no misconception, and if the contractor does not add his profit he does not get it.

A very general fault I find in quantities in this district is that there are not enough provisional sums included. Oftentimes, more particularly in alteration works, one has to price items, the cost of which it is impossible accurately to estimate until the work is being done. In all such cases a provisional sum should be inserted at the discretion of the surveyor, and the matter adjusted at schedule rates.

Again, with regard to some items the descriptions are often most inadequate. From a builder's standpoint, all items should be described so as to render it unnecessary for him to be continually referring to the drawings when preparing his estimate. It is not at all unusual to find the thickness of walls omitted in items for drawing openings for doors and windows, and the sizes of the same are also left to the imagination of the builder. On inquiry you are of course referred to the drawings.

The preparation of estimates is a most serious thing in a builder's business. Unless he is in a very large way he has to do most of the pricing himself, and when one considers the time this occupies and the number of estimates he has to send in for every one he is fortunate enough to get, the necessity for the quantities to be as explanatory and explicit as possible is apparent. In quantities, as with everything else, it is the best that is the cheapest, and I am confident, from my own experience, that the interests of the proprietor and also the builder are best safeguarded if a first-class surveyor prepares the quantities and adjusts the accounts. Much more might be written upon this interesting subject of quantities, but time does not permit.

Another important factor in considering building contracts is the clerk of works, so important a factor that I am of opinion that he deserves a paper to himself. Too much consideration cannot be given by an architect in selecting his clerk of works. One man, if he is not thoroughly conversant with his work both practically and theoretically, may make the work cost 5 or 10 per cent. more than another man, whilst both attain the same result. In many instances they have absolutely no conception as to the duties of their position, but imagine that all they have to do is to see that proper materials are used. My own idea is that the clerk of works should be the architect's representative upon the works, and as such he should be prepared to obtain and give all information necessary to the proper carrying out of the contract; he should be responsible, with the builder's foreman, for the proper setting out of the various parts of the building, and should also, in a measure, be responsible for the time taken to complete the contract. It would be a very good thing if they could be engaged at so much per contract. I think architects would then find their works executed with much more promptitude and despatch.

There are many excellent clerks of works I have had to do with, and I have to acknowledge many kindnesses at their hands, but I really do not think that architects generally appreciate the harm and annoyance which an incompetent or unprincipled man causes a contractor, who in the majority of cases is powerless to complain, for reasons which must be obvious.

In conclusion, there are three points in building contracts that I would strongly impress upon architects:—1. The necessity of keeping up all approximate quotations. Nine-tenths of the troubles between architect and builder, and also the proprietor, arise

from the fact that in the majority of cases the cost is considerably more than was expected. 2. To remember that it is essential for the good of the community that the builder makes a profit. If he is not allowed to do it fairly, he is, I fear in many cases, apt to do it unfairly.

3. Always be prepared to grant certificates if the money is due. The financial question is a most important one with builders, and whilst there is no difficulty in obtaining the first payment, one has often to write two or three times, without getting a reply, in one's efforts to get further certificates.

Speaking as a contractor who has sufficient capital for the amount of business done, I can honestly state that more worry and anxiety is caused the builder over this question than by any other detail in his business.

ENGINEERING SOCIETIES.

INSTITUTION OF MECHANICAL ENGINEERS.—From the annual report of this Institution we learn that the number of members was, at the close of the past year, 3,165. Thirty-three members have died during the year, among them Lord Armstrong, who was a past-president. With a view to the formation of a historical museum, relating to mechanical engineering progress, several gifts of value have been promised, and members are invited to help with suitable contributions of drawings and models. The summer meeting, extending over three days in June, was held in London, when the members of the American Society of Mechanical Engineers accepted the invitation of the Institution, and attended the business meetings and the excursions in considerable numbers. The numerous letters which have since been received from the United States evince a thorough appreciation of the reception accorded to the visitors by the Institution. The Council were requested by the Executive of the Glasgow International Engineering Congress to take an active interest in its success, and after full deliberation and consultation with the officers of other institutions, the Council have consented to take charge of the mechanical section of the Congress, the meetings of which will be held during the first week of September, 1901. They have also decided that these arrangements should not interfere with the ordinary summer meeting of the Institution, which will be held during the last week in July at Barrow-in-Furness.

ANCIENT LIGHTS.

The following Report has been adopted by the Council of the Royal Institute of British Architects, and intimation of such adoption has been conveyed to the Council of the Surveyors' Institution:—

Whereas by a resolution of the Royal Institute of British Architects passed at the general meeting of April 9, 1900, it was decided:—

"That this meeting considers an alteration in the law of Ancient Lights to be urgently needed, and requests the Council to put itself into communication with the Council of the Surveyors' Institution without delay, with a view to the co-operation of that body in taking such steps as may be necessary to secure an amendment";

And whereas the Surveyors' Institution, having been invited so to do, agreed to act in conjunction with the Royal Institute and to appoint a Committee to deal with such matters;

And whereas a Joint Committee, consisting of the undersigned, have held meetings and have carefully considered the subject of the above reference;

And whereas such Joint Committee are of opinion that the law and practice of Ancient Lights is exceedingly unsatisfactory in several respects and requires amendment in the manner herein suggested;

Therefore the Joint Committee recommend that the law and practice in respect of Ancient Lights be amended as follows, viz.:

1. The right to ancient lights shall, in all cases where such rights have not been already acquired, be limited to a right to receive light sufficient for all ordinary purposes, but shall not include a right to light of extraordinary amount for special purposes.

2. After the passing of the Act the owner of any tenement not at any time servient to some neighbouring tenement, but over which such neighbouring tenement would in course of time acquire dominant rights, may serve upon the owner of such neighbouring tenement a formal notice, in form and manner prescribed by the Act, and may advertise the same in the daily papers, and register the same at the Land Registry, where one exists, of the district, or, where no such Land Registry exists, at the offices of the County or Municipal Council of

the locality. Such notice shall have the same effect as though an interruption had been submitted to for one year, and such notice shall run with the land.

3. The owner of a building which is about to be taken down may cause plans, sections, and elevations to be prepared, and such drawings, if they are attested by the District Surveyor, in London, or the County or Borough Surveyor elsewhere, shall be accepted as legal evidence. Such drawings shall, on demand, be certified and registered by the officers above-named, who shall be paid fees on a scale appended to the Act.

4. No building erected after the 1st January, 1905, shall acquire any fresh rights of light or air where it abuts on any street, highway, road, court, or alley used by the public, or as an access to various tenements either held in the same ownership or in various ownerships.

5. The owner, lessee, or occupier of any tenement, who considers that his ancient lights will be or have been interfered with by the erection or proposed erection of new premises or alterations to old ones, shall have the right to inspect (or have inspected on his behalf) the drawings which shall be prepared by the building owner of the premises are in existence, to be informed of the intentions of the building owner, and to take or have taken such particulars from the drawings or information or from the building itself, if erected, as may enable him to ascertain where there is ground for complaint.

6. If such neighbouring owner, lessee, or occupier considers that the lights of his premises will be interfered with, he shall, within seven days from obtaining such information as aforesaid, give notice in writing by registered post of his objection to the building owner together with the name and address of a surveyor, who shall have power to act, on his behalf.

7. Within seven days of the receipt of such notice the building owner shall acknowledge the said notice, by registered letter, and inform the person from whom he received notice of objection of the name and address of his surveyor, who shall also have power to act on his (the building owner's) behalf.

8. Such two surveyors so appointed shall, within ten days of the date of the appointment of the last of them, select and appoint an umpire under their hands in writing, such umpire being a member of the Royal Institute of British Architects or of the Surveyors' Institution. The first-named two surveyors shall within the like period meet and discuss the points raised by the owner, lessee, or occupier, with a view of settling the same, and failing coming to a settlement they shall refer the matter to the umpire appointed as aforesaid. The said umpire shall view the site and buildings of both plaintiff and defendant, and shall have power to take such evidence upon oath as he may think necessary, and he shall, within twenty-one days from the date of the matter being placed before him, or within such extended time as may be from time to time determined, issue his award, in which he shall determine either in favour of all of the following points:—(a) the right of the building owner to carry out his intended works, the alteration (if any necessary) to be made in carrying out the proposed new buildings or alterations to prevent or lessen the obstructions complained of, and the amount (if any) of compensation of every description to be made to the owner, lessee, or occupier, the alterations or improvements to the adjoining premises by light-reflecting surfaces, enlargements of lights, heightening of premises, or other means, the amount of costs to be paid by each or either party, and generally all matters required to arrive at a settlement.

9. In the event of either party neglecting to appoint a surveyor within the time prescribed, or of the unwillingness of the umpire appointed to act, and no other umpire being agreed upon within a further period of ten days, either party shall apply to the President for the time being of the Royal Institute of British Architects, or the President of the Surveyors' Institution, who shall appoint an umpire forthwith, with all the powers as before described.

10. If either party shall be dissatisfied with the decision of the umpire, he may appeal to an Appeal Committee to be formed of nine persons, appointed annually, viz., three architects to be appointed by the Royal Institute of British Architects, three surveyors to be appointed by the Surveyors' Institution, and three barristers to be appointed by the Home Office. Three members of whom one shall be an architect, one a surveyor, and one a barrister, shall form a quorum. The decision of this committee, save as hereafter mentioned, shall be final, and they shall have full discretion as to costs. Before giving the decision the members of the plaintiff and defendant, and shall have power to decide whether, and, if so, to what extent, the proposed new buildings shall be amended, or the dominant premises altered.

11. In the event of either party refusing to accept the decision of the committee in all cases in which a larger sum than 500l. is awarded, either in money, damages, or works, or in which the interference with the proposed works exceeds 500l.

in value, he shall have power within one month from the publication of the said decision to bring the matter before the High Court of Justice by a summary process. The Court shall have the full powers set out in clause 8 aforesaid.

12. In any action to restrain building on the ground of its interference with the rights of light, and whether an interim injunction has been obtained or not, either party may apply to the judge by summons, either to hear the same with an assessor or assessors, or to refer the same to arbitration in accordance with clauses 8 and 10. If at the hearing of such application or motion for injunction it appears to the judge that the claim may be satisfied by damages, he may himself refer the case to such arbitration, and if he considers that the action for an injunction has been commenced unreasonably or unnecessarily, may order the party bringing such action to pay the defendant's expenses and costs on such scale as he may deem fit.

And the Joint Committee further recommend that they be empowered to expend the necessary funds in drafting a Public Bill to carry out the above provisions.

The Joint Committee also beg leave to submit to the Councils of the Royal Institute of British Architects and the Surveyors' Institution, for their consideration, copies of correspondence that has taken place between the Committee and the Council of the Incorporated Law Society.

(Signed)
 T. Roger Smith (Chairman)
 Edw. A. Gruning
 J. Douglass Mathews
 J. Fletcher Moulton, Q.C.
 Herbert Thos. Steward
 Alex. R. Steingart
 Howard Chaffield Clarke
 George M. Freeman, Q.C.
 December, 1900. W. J. Locke, Secretary.

The following is the correspondence referred to in the concluding paragraph of the report:—

30th October 1900.
 The Secretary, Incorporated Law Society.

DEAR SIR,—
 With reference to the resolution carried at the Annual Provincial Meeting of the Incorporated Law Society recently held at Weymouth, which is reported in the newspapers as follows:—
 "That the Council take steps with a view to getting the Law of Ancient Lights considered by the Legislature, and if they thought fit to co-operate with the Royal Institute of British Architects and the Surveyors' Institution," I have the honour to inform you that a Joint Committee of the Royal Institute of British Architects and the Surveyors' Institution, which includes two Queen's Counsel, hon. members respectively of the Royal Institute and the Surveyors' Institution, is at present sitting, with a mandate from these two bodies to take such steps as may be necessary to secure an amendment of the Law of Ancient Lights.

Should such a procedure be acceptable to the Council of the Incorporated Law Society, the Joint Committee would be very happy, before taking any public action, to communicate to them the result of their deliberations, with a view to co-operating with the Incorporated Law Society in promoting a Bill in Parliament to secure an amendment of the existing law.

I should be glad to lay the reply of your Council before the Joint Committee at an early date.—I am, dear sir, yours faithfully,

T. ROGER SMITH,
 Chairman of the Joint Committee.
 Law Institution, Chancery-lane, W.C.
 November 10, 1900.

T. Roger Smith, Esq., F.R.I.B.A.
 DEAR SIR,—I am directed by the Council of the Incorporated Law Society to thank you for your letter of October 30, and to say that the Council will be obliged if you will let them see the draft of the proposed Bill when framed, and that they will give it their careful consideration.—I am, dear sir, yours faithfully,
 E. W. WILLIAMSON,
 Secretary Incorporated Law Society.

BOOKS RECEIVED.

CROYDON: NEW AND OLD (HOMELAND HAND-BOOKS). By E. A. Martin, F.G.S. (The St. Bride's Press, 3d).

JOURNAL OF THE SANITARY INSTITUTE.—Vol. xxi.; part 4. (E. Stanfard.)

THE STUDENT'S COLUMN.—Our Student's Column article ("Sanitary Fittings and Plumbing") is unavoidably held over until next week.

MEETINGS POSTPONED.—The ordinary meeting of the Institution of Civil Engineers on Tuesday, January 22, was adjourned, without the transaction of business, to Tuesday, January 30. The Students' Meeting appointed to be held on Friday, January 25, is adjourned to Friday, February 1.—The Anniversary Dinner of the Institution of Junior Engineers, which was to have taken place on the 26th inst., has been postponed.

THE LONDON COUNTY COUNCIL.

The first meeting of the London County Council after the Christmas recess was held on Tuesday in the County Hall, Spring Gardens, Mr. Torrance (Vice-chairman) presiding in the absence of Alderman W. H. Dickinson.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Paddington Borough Council 9,400l. for the purchase of land and reconstruction of bridge; the Deptford Borough Council 9,700l. for brick sewer works; Lewisham Borough Council 1,150l. for paving and drainage works, and 5,600l. for purchase of an open space; Battersea Borough Council 2,460l. for erection of sawmill, &c.; Hampstead Borough Council 4,386 for additional cells to dust-destroyer; Kensington Borough Council 1,100l. for street improvement; Lambeth Borough Council 2,650l. for underground convenience; St. Pancras Borough Council 50,000l. for the erection of baths; Woolwich Borough Council 7,600l. for a public library, and 8,070l. for various purposes; and Mile End Old Town Guardians 2,980l. for the erection of cottage homes.

List of Rates of Wages and Hours of Labour.—The same committee reported as follows, the recommendation being agreed to:—

"We have received a notification from the London Master Builders' Association that by agreement between masters and men an advance of 3d. per hour has been made, as from January 1, 1901, in the rates of wages paid to bricklayers. We therefore recommend that that rates of wages inserted in the Council's list of rates of wages and hours of labour as payable to bricklayers be amended, and that the rate be increased as from January 1, 1901, by 3d. per hour."

Bridges.—The General Purposes Committee reported as follows, the recommendations being agreed to:—

"We have received a joint memorandum from the Bridges and Improvements Committees stating they have had under consideration a suggestion to the effect that in future all bridges should be constructed by the Bridges Committee, except in cases where a bridge improvement is subsidiary to a street improvement, and that after consultation the two Committees have agreed to a form of amendment of the orders of reference to them, which, they believe, will assist the work of the Council. We concur in the proposals of the Bridges and Improvements Committees, and accordingly submit them for adoption. We recommend:—

(a) That the following addition be made to the orders of reference to the Bridges Committee:—

"In all cases in which the formation or widening of a bridge over a road, railway, or canal is the object of the improvement, the Bridges Committee shall take all initial proceedings in connexion with the work of construction of such bridge, and subject to the sanction of the Council, shall carry out the scheme. In all cases in which the formation or widening of bridges over roads, railways, or canals forms part of a street improvement, the Improvements Committee shall consult the Bridges Committee as to the design for the structure; after all necessary arrangements shall have been made by the Improvements Committee, the Bridges Committee shall undertake the work of construction of such bridge, and upon completion thereof shall hand it over to the Improvements Committee in connexion with the remaining portions of the improvement undertaken by the Improvements Committee."

(b) That the following words be omitted from the fourth paragraph on page 249 of the present order of reference to the Improvements Committee, viz., "including the formation or widening of viaducts or bridges over roads, railways or canals where such works form an integral part of a street improvement," and that the following words be substituted:—"In all cases in which the formation or widening of bridges over roads, railways, or canals forms part of a street improvement, the Improvements Committee shall consult the Bridges Committee as to the design for the structure; after all necessary arrangements shall have been made by the Improvements Committee, the Bridges Committee shall undertake the work of construction of such bridge, and upon completion thereof shall hand it over to the Improvements Committee in connexion with the remaining portions of the improvement undertaken by the Improvements Committee."

Fire Exhibition in Berlin.—It was recommended by the General Purposes Committee that no part be taken in the International Fire Exhibition to be held at Berlin in 1901.

Mr. Campbell expressed the hope that the Council would see its way to be represented at the Exhibition. He thought it would be a gross mistake not to send some appliances, and moved that the recommendation be referred back.

Mr. Lawson seconded the amendment, which was carried.

Horton Estate: Working Colony for Epileptics.

—The Asylums Committee recommended: "That, subject to the approval of the necessary plans by the Secretary of State, the estimate of 89,000l. submitted by the Finance Committee for the erection of buildings, &c., for an epileptic colony on the Horton Estate, for the accommodation of 300 insane male epileptic patients and staff, be approved."

"The area decided for the purpose of the colony is triangular in shape, and about 127 acres in extent. The site is bounded by main roads on two of its three sides, and is well divided by hedges in which there are a number of trees. A public footpath runs across the land, dividing it into two sections, the larger of which, 80 acres in extent, is the site of the proposed colony buildings. The buildings will consist of eight villas of two separate types, each designed to accommodate thirty-six patients and two attendants. In each villa a food and clothes store and a sanitary annexe will be included, and each will contain two single rooms. The villas will be single-story buildings, it being considered undesirable to house epileptics in two-story buildings, and, in addition, the one-story building is cheaper. There will be a house for the bailiff or other sub-officer, a residence for the medical superintendent, a block of administrative buildings which will include committee rooms, offices for the general staff, quarters for assistant medical officer and inspector, and a block for those attendants not accommodated in the villas, these four latter buildings being the only two-floored buildings in the colony. Attached to the administrative buildings will be (inter alia) the infirmary, which will accommodate twelve patients and include six single rooms, two being also added, and a common dining-hall which will seat 320 persons, and will also be used for religious and recreative purposes, the patients taking their other meals in their own villas. The houses of the medical superintendent and bailiff will be of stock brickwork up to the first floor level, and above that finished in rough cast. The administrative centre and steward's store will be in red brickwork, the corridors in stock work and red brick. The external walls of the recreation hall will be finished in rough cast, with red brick buttresses. Four of the villas will be wholly in red brickwork, the remaining four in rough cast, and the whole of the roofs will be tiled. The boiler-house, tower, and chimney will be stock work, with red gauged arches, and the internal walls will be plastered in all buildings except the tower and boiler-house. The total number of patients for whom accommodation will be found in the villas is 288, accommodation being provided in the infirmary for twelve patients, making a total of 300. There will be twenty-two single rooms in all, but these are not included in the number of beds available nor in the computation of the cost per bed. The total resident staff provided for is a medical superintendent, an assistant medical officer, an inspector, and thirty-three attendants, being approximately one attendant to 9.1 patients. The villas will be heated by double fireplace hot-air stoves. The single rooms in the infirmary will, in addition, be heated by steam pipe, and low pressure steam heating will be employed for the steward's stores, dining-hall, corridors, &c. A simple system of telephones, fire alarms, &c., will be provided, each villa being in communication with the administrative centre. The lighting will be by electricity, to be supplied from the central station already approved by the Council, and the water supply will be obtained from the well now being sunk on the estate. The laundry at the Manor Asylum and the Horton Asylum, when completed, will be available for the colony buildings. It is proposed to include the construction of the main roads in the building contract, but not the minor roads, which we anticipate will be made by patients. The drainage arrangements are designed to deliver the sewage on to the Epsom sewage farm direct, which is adjoining, if an outfall is provided by the Epsom Urban District Council, but in the event of the negotiations with Epsom for this purpose proving unsuccessful, it will be necessary to re-arrange the system, which it is estimated would entail an extra expenditure of 1,100l. above the estimate submitted. The asylum's engineer's estimate of the total cost of the scheme amounts to 89,000l., or 296l. 13s. 4d. per bed for 300 patients. To this sum, however, should be added the grant of 3,000l. made by the Council in January, 1899, of which sum about 1,600l. has been expended. With this addition the total cost would be 306l. 13s. 4d. per bed."

Mr. Beachcroft said that something like a year ago the Council authorised the Asylums Committee to undertake a new system for the housing of epileptics, and the preliminary estimate was then 60,000l. for the building, and the cost per head would be 220l. Now they were told that the cost of the building would be 89,000l., and the cost per head 306l. It was because they were told that the cost per head would be lower than that at the Horton Asylum that the Council decided to go in for the experiment. As a matter of fact, the cost

would be greater than the cost at Horton. He asked whether, even although they had spent 1,000*l.* on investigation, it would not be better to pause before going in for such a very expensive scheme.

Dr. Cooper complained that directly the Committee tried to make a new departure in the treatment of lunacy there was an attempt to deter them. The colony would be in advance of any German or American scheme, and was a scheme, if carried out, which the Council would have cause to be proud of.

Mr. Hubbard explained that the cost of building material and wages had largely increased, and that they had to meet the demands of the Lunacy Commissioners, which led them into further expenditure.

The recommendation was carried.

High-street, Kensington, Improvement.—The Improvements Committee recommended, and it was agreed,

"That the supplemental estimate of 96,500*l.* submitted by the Finance Committee in respect of the Kensington High-street improvement be approved, and that the Improvements Committee be authorised to incur further expenditure on capital account up to that amount for the purpose of the improvement in question."

Fire Station, East Greenwich.—The Fire Brigade Committee recommended, and it was agreed,

"(a) That the Council do sanction an expenditure of 13,100*l.* for the work of erecting the East Greenwich fire-station; that the work be executed by the Council without the intervention of a contractor, and that the drawings, quantities, specification and estimate be referred to the manager of works for that purpose.

"(b) That the Council do authorise an expenditure of 750*l.* in connexion with the electric light installation at the East Greenwich station and for incidental expenses arising out of the erection of the station."

By-laws as to the Drainage of Buildings.—The Public Health Committee reported as follows:—

"On December 18 last the Council on our recommendation resolved to inform the Local Government Board that it did not think it desirable to delay the confirmation of its Drainage By-laws in order that they might be considered by the Councils of the Metropolitan Boroughs, seeing that the Vestries and District Boards were given the opportunity of making suggestions on the draft, and that their observations were carefully considered.

The Board now state that they have informed the Borough Councils who asked for an opportunity of discussing the By-laws that the Board will consider any further representations they desire to make, but that these representations should be confined to matters not already dealt with, and should be submitted as early as possible."

Tenders.—The Fire Brigade Committee recommended and it was agreed, that the tender of Messrs. Johnson & Co. to execute for 204*l.* 9*s.* 5*d.* the repairs and painting required at the Waterloo-road station be accepted.

The Main Drainage Committee recommended and it was agreed, that the offer of Messrs. L. J. & C. Seager to supply for 290*l.* 3*s.* 4*d.* certain new parts required for the circulating pumps of the four beam-engines at the Crossness outfall be accepted, and that the work of fixing the parts be carried out by men employed by and under the supervision of the superintendent.

St. Clement Danes and St. Mary-le-Straud Churchyards.—The Improvements Committee recommended and it was agreed, "That the action of the Improvements Committee in arranging with the London Necropolis Company to undertake, at an estimated cost of 650*l.*, the work of laying the foundations of the dwarf wall and railings to be erected around the portions of the churchyards of St. Mary-le-Straud and St. Clement Danes churches not required for the purposes of the Holborn to the Strand improvement be approved."

Middle Level Sewer. Proposed New Sewer Scrubs-lane, Hammersmith.—It was agreed that an advertisement be issued inviting tenders for the extension of the middle-level sewer to Mitre Bridge, and for the construction of a sewer along Scrubs-lane from the county boundary to Waldo-road, and a length of sewer under the existing ditch forming the overflow from the Counter's Creek sewer, in accordance with the plans and specification prepared by the engineer.

Precipitation Operations during 1900.—The

Main Drainage Committee reported as follows:—

"We submit for the information of the Council the following table showing the quantities of sewage treated, chemicals used, and sludge sent to sea, as well as the quantity of refuse intercepted at the gratings at each of the outfall works at Barking and Crossness during the year ended December 31, 1900:—

	Barking.	Crossness.	Total.
Sewage treated	48,508,000,000	36,101,000,000	84,609,000,000 galls.
Maximum daily flow	293,392,000	179,995,062	—
Minimum daily flow	72,810,000	64,023,290	—
Line used	12,009	7,455	20,454 tons.
Proto-sulphate of iron used	2,918	2,011	4,929 "
Sludge sent to sea	1,574,000	798,000	2,372,000 "
Average per week	30,270	15,346	45,616 "
Refuse from gratings	4,176	813	4,989 "

Comparing the above figures with the returns for the preceding year, we find that the increase in the quantity of sewage treated is 6,920,186,000 gallons, and in the quantity of sludge sent to sea 82,000 tons."

The Council adjourned shortly before 7 o'clock, immediately the death of the Queen was announced.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Lewisham.—Houses on the north and east sides of Southend-lane, Lower Sydenham (Mr. F. J. Smith).—Consent.

Deptford.—One-story shops on part of the forecourt of Nos. 122 and 124, New Cross-road, Deptford (Mr. R. Whaley for Mr. J. Murray and Miss A. Johnson).—Consent.

Kensington, South.—That the application of Mr. P. E. Pilditch for an extension of the period within which the erection of a building on the forecourt of Messrs. Barker's furniture depository on the south side of Pembroke-road, Kensington, was required to be commenced, be granted.—Agreed.

Paddington, South.—A conservatory in front of No. 19, Porchester-terrace, Paddington (Mr. M. Garbutt for the Metropolitan Railway Company and Mr. G. P. Ness).—Consent.

Mile End.—No order with respect to the application of Mr. F. A. Walters on behalf of the Rev. W. Donlevy, for consent to the rebuilding of the Church of the Guardian Angels on the north side of Mile End-road, Mile End, between Nos. 373 and 377.—Agreed.

Bow and Brouley.—A one-story addition upon part of the forecourt of No. 86, Bow-road, Bow (Messrs. Holman & Goodham for the Royal London Friendly Society).—Refused.

Kensington, South.—An iron and glass shelter at the entrance to No. 19, Bolton-gardens, Kensington (Messrs. W. T. Allen & Co. for Mr. L. Samuel).—Refused.

Dulwich.—The erection on three sites on the south side of East Dulwich-road, Camberwell, one of the sites abutting also upon Oakhurst-grove, of dwelling-houses (Mr. W. E. Deane for Mr. A. J. Walke).—Refused.

Finsbury, East.—The rebuilding of Nos. 228 and 230, Old-street, Finsbury, to an advanced line of frontage on the upper floors (Messrs. Crickmay & Zimmerman for Mr. A. Lefever).—Refused.

Greenwich.—An hotel, with stables, on the south-east side of Beaconsfield-road, Westcombe-park, Greenwich, at the corner of Mycenæ-road (Mr. M. L. Saunders for Mr. F. Bell).—Refused.

Hackney, Central.—A house and warehouse at the rear of No. 41, Mortimer-road, Kingsland, to abut upon Downham-road (Mr. J. B. Watts).—Refused.

Lewisham.—A house, with a shop on the ground floor, and three dwelling-houses with bay-windows, on the west side of Bronley-road, Lee, at the corner of Ronver-road (Mr. A. Eke).—Refused.

Projections.

City of London.—An iron and glass shelter at the entrance to the Holborn Viaduct Hotel, Holborn Viaduct, City (Mr. H. Godbold for Messrs. Spiers & Pond, Limited).—Consent.

Kensington, South.—A four-story bay-window in front of No. 3, Victoria-road, Kensington (Messrs. C. Saunders & Son for Mr. J. G. Broomfield).—Consent.

Marylebone, East.—A balcony at the second floor level in front of Nos. 14 and 14A, Princes-street.

Cavendish-square (Mr. A. E. Hughes for Mr. E. G. Betts).—Consent.

Newington, West.—Five projecting arc-lamps on the parapet wall in front of the Princess of Wales' Theatre, Kennington Park-road, Kennington (Messrs. H. Greene & Sons, Limited, for Mr. R. Arthur).—Consent.

Strand.—An iron and glass shelter at the entrance to the new grill-room at the eastern end of the Princess' Restaurant, Piccadilly (Messrs. J. T.

Wimperis & Arber for the Princess' Hall Restaurant, Limited).—Consent.

Strand.—An iron and glass shelter over the entrances in Rupert-street to Mr. Lowenfeld's theatre, adjoining the Lyric Theatre, Shaftesbury-avenue, St. James's (Mr. L. Sharp for Mr. H. Lowenfeld).—Consent.

Marylebone, East.—A projecting clock in front of No. 126, Oxford-street, St. Marylebone (Messrs. Maple & Co., Limited, for Mrs. Crossley).—Refused.

Marylebone, West.—Re-erection of the balcony at the first-floor level in front of No. 42, Montagu-square, St. Marylebone (Mr. F. W. Hunt for the Honourable Miss Powys).—Refused.

Width of Way.

Finsbury, East.—An addition to the King's Arms tavern, No. 18, Moreland-street, City-road, St. Luke's, at less than the prescribed distance from the centre of Cross-street (Messrs. Eedle & Meyers for Mr. W. E. Eaton).—Consent.

Rotherhithe.—A Congregational church on the north side of Queen Elizabeth-street, Bermondsey, with the forecourt fence and a portion of the church at less than the prescribed distance from the centre of Horselydown-lane (Mr. J. Willis for Mr. F. F. Ashley).—Consent.

City of London.—Addition to Nos. 28 to 31, Bishopsgate-street, Within, City, at less than the prescribed distance from the centre of a carriage-way leading from Bishopsgate-street Within to Crosby-square (Mr. T. H. Smith for Messrs. Lewis & Marks).—Consent.

St. Pancras, East.—A cart-house and stable, with rooms over, on the east side of Rochester-place, Kentish Town, at less than the prescribed distance from the centre of the street (Mr. J. A. Smith for Mr. F. J. Moulde).—Consent.

Clapham.—A two-story cottage on the south side of Upper Orchard-street, Brixton, between Nos. 29 and 31, with both the cottage and the forecourt fence at less than the prescribed distance from the centre of the street (Mr. M. Marsland for Mr. J. T. Grant).—Refused.

Space at Rear.

Wandsworth.—A one-story addition in a yard at the rear of No. 2, Charlwood-road, Putney, without the premises being provided at the rear with such an open space as is required by Part V. of the Act (Mr. E. H. Dance for Mr. G. Wootton).—Consent.

Battersea.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story addition over a one-story plumber's shop at No. 1, Stammer-street, Colestone-street, Battersea, with an irregular space at the rear (Mr. G. Hayter for Mr. J. Derrett).—Refused.

Deviation from Certified Plans.

Dulwich.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed erection of five houses partly on the site of eight houses known as Grove-cottages, in a way leading out of Camberwell-grove, Camberwell (Mr. E. W. Mitchell).—Consent.

Projections, and Deviations from Certified Plans.

Kensington, South.—Certain deviations from the plans certified by the District Surveyor, under Sections 22, 43, 73 of the Act, so far as relates to the proposed erection of a block of residential flats on the site of Nos. 15 and 17, Gledower-place, Kensington (Mr. G. H. Fox for the Kensington Freehold Land Trust, Limited).—Refused.

Width of Way and Lines of Frontage.

Peckham.—One-story relief station at the rear of No. 87, Nunhead-lane, Peckham, to abut upon Albert-road and Scylla-road (Mr. A. E. Mullins for the Guardians of St. Giles, Camberwell).—Consent.

Brixton.—A one-story addition on the forecourt

of a workshop next No. 1, Station-road, Brixton (Mr. F. Harmer)—Refused.

Width of Way and Projection.

City of London.—An iron landing at the fourth floor level in front of No. 26, Paper-street, City, to overhang the public way (Mr. P. E. Tubbs for Messrs. Tubbs & Hiscocks)—Consent.

Lines of Frontage and Construction of Buildings, &c.

Poplar.—An overhead wood-transporter, to be constructed of steel and wood, across East Ferry-road, Poplar, near its junction with Glengall-road (the Millwall Dock Company)—Consent.

Hackney, North.—An iron and glass roof in front of a coach-house at No. 29A, Woodberry-grove, Green-lanes, Stoke Newington (Mr. R. Midworth for Mr. E. Barnett)—Consent.

Wandsworth.—That Messrs. R. Reid & Co. be informed that the Council is not prepared to accede to their request for permission to retain a wooden coal-order office on the north-west side of Mitcham-road, Tooting, at its junction with Longley-road.—Agreed.

Width of Way and Construction of Buildings, &c.

Deptford.—A temporary wood and iron office-building at the Kent Waterworks Company's premises, to abut upon Mill-lane, Deptford (Mr. W. Morris for the Kent Waterworks Company)—Refused.

Norwood.—A temporary wood and iron school-room and offices on the south side of Horsford-road, at the rear of Corpus Christi Church, Brixton Hill, to adjoin the clergy-house (Messrs. Humphreys, Limited, for the Corpus Christi School Committee)—Refused.

Space at Rear and Construction of Lift Shaft.

St. George, Hanover-square.—A lift-shaft for an electric elevator on a portion of the open space at the rear of No. 8, Stratton-street, Piccadilly (Messrs. Meynell & Penton for the Hon. R. J. G. Dicconson)—Consent.

Width of Way, Lines of Frontage, and Space at Rear.

Chelsea.—A block of residential flats on the south-west side of Park-walk, Chelsea, at the corner of Chapel-street (Mr. C. W. Stephens for the Metropolitan Industrial Dwellings Company)—Consent.

Greenwich.—The rebuilding of No. 220, Trafalgar-road, East Greenwich, to abut also upon Colombus-street (Mr. R. Whaley for Mr. W. C. Rose)—Consent.

Formation of Streets.

Hackney, Central.—That an order be issued to Mr. E. O. Sachs, sanctioning the widening and adaptation for carriage traffic of a portion of Tyssen-passage, Dalston-lane, Hackney (for The Shannon, Limited). That the name Tyssen-passage be approved for the new street.—Agreed.

Levensham.—A further deviation from the plan and particulars sanctioned by the Council on January 25, 1898, as modified by the plan sanctioned on October 4, 1898, for the formation or laying-out of a new street named Undercliffe-road on the Hollyfields Park Estate, so far as relates to a proposed alteration in the southern end of that road (Mr. W. H. Collier)—Consent.

Woolwich.—That an order be issued to Messrs. Church, Quick, and Whincox sanctioning the formation of laying-out of a new street for carriage traffic to lead from Eglington-road to Plum-lane, Plumstead (for Mr. T. Nash, Mr. R. J. Dallin, and Miss E. M. Dallin). That the name Dallin-road be approved for the new street.—Agreed.

Levensham.—That an order be issued to Mr. J. W. Webb, refusing to sanction the formation or laying out for carriage traffic of new streets on the Crofton Park Estate, Brockley.—Agreed.

Hampstead.—Fences across the ends of a new street to be named Grenville-street, Hampstead (Mr. C. J. Bentley)—Refused.

Height of Building.

Islington, West.—That the application of Mr. F. Matcham for an extension of the periods within which the erection of a theatre building on the south side of Holloway-road, Islington, to exceed in height the width of a new street to lead from Holloway-road to Waiters-road, was required to be commenced and completed, be granted.—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

SANATORIUM ON DEESIDE, NEAR ABERDEEN.

The new Scots Nordrach Sanatorium (for tuberculous) at Nordrach-on-Dee, Banchory, has now been completed. There are forty bedrooms, and the cost per bed is upwards of £600. Mr. George Coult, Aberdeen, was architect, and the contractors were as follows:—Mason work, Edgar Gauld; carpenter, D. MacAndrew & Co.; plumbing, sanitary arrangements, and electric lighting, Jno. F. Anderson; painting, Jas. Garvie & Sons; plaster work and tiling, Jas. Scott & Son; engineer work, B. H. Gibson & Co. (all of Aberdeen); and Mr. James Smith, Aberdeen, was consulting engineer. The buildings are in Hill of Fare granite.

Correspondence.

To the Editor of THE BUILDER.

THE ANALYSIS OF MORTAR.

SIR.—In an article on the above, published in the Builder of December 22, 1900, reference was made to my method of determining soluble silica in the analysis of mortar, in the following words:—"Mr. Hughes and other workers appear to have overlooked the fact that silicate of alumina, the main constituent of clay, is more or less soluble in hot caustic soda solution, and that therefore before regarding the whole of the silicious matter found by Mr. Hughes's test as soluble silica, the soda filtrate must be examined for alumina."

This suggestion is quite in order, and should be attended to in the analysis of inferior or jerry mortar of the present day, but in reference to the mortar used in the construction of our old castles and abbeys the precaution above suggested is quite unnecessary, for the simple reason that clay or mud was not employed, but only sand and slaked lime. Any alumina present in the lime would naturally be dissolved out in the original exhaustion of the mortar with hot hydrochloric acid and the subsequent evaporation to complete dryness in a water bath.

For greater satisfaction, however, the specimen of mortar from the old Roman ruins at Silchester, reported on in the Builder of December 1, has been re-examined, but no trace of alumina could be detected in the soda filtrate, so that the original figures, 1.270 per cent, may be taken correctly to represent the amount of soluble silica present in the Silchester mortar.

Passing on to the general question of mortar analysis, there can be no doubt that an efficient method of determining the actual amount of active lime present in a specimen of recently-put mortar is much required. The actual figures for the total amount of lime present cannot be relied upon as a safe indication of the quality of such mortar.

This was pointed out by the writer on the occasion of the reading of the paper of Messrs. Dibdin and Grimwood before the Society of Public Analysts, June 5, 1896, and the mortar from Rochester Castle (of which only the keep remains), containing as much as 28.67 per cent. of lime, was quoted as an illustration of an inferior mortar; while that from Tintern Abbey, containing only 18.84 of lime, was quoted as an illustration of particularly good mortar, which was practically proved by the fact that the four gable-ends of this beautiful ruin still retain their original upright form intact, notwithstanding their comparatively light structure. Further, the employment of old bricks, which, according to Mr. Dibdin, may contain as much as 7.77 per cent. of lime in themselves, naturally introduces a certain amount of non-effective lime, though the proportion of such lime would usually be indicated by its association with carbonic acid.

Certainly, if analyses of mortar are resorted to as one means of determining the quality, they should be made as full and complete as possible.

The introduction of general terms such as "earthy matter" should be strongly objected to, inasmuch as such general expressions do not, and cannot, convey to magistrates any definite information whether a mortar has been compounded of well-burned lime and sharp sand in suitable proportions, or whether it has been made from badly-prepared lime and unsuitable substitutes for sand.

JOHN HUGHES, F.I.C.,

District Agricultural Analyst for Herefordshire.

SOANE MEDALLION COMPETITION.

SIR.—I wish to point out that in your able criticism of my drawings for the Soane Medallion you overlooked the fact that the library is lighted in the centre bay, as shown in Section C D.

MATHEW DAWSON.

** We see Mr. Dawson is right; the section was hung close to the floor and out of the way of the other drawings, so that it escaped our notice. We may observe, however, that it is well, in the case of a dome-lighted compartment, to show the plan of the light in dotted lines, so as to call attention to its existence.—ED.

COOMBER V SOMERSET.

SIR.—May we draw your attention to your report of the case of Coomber v. Somerset, which appears in your issue of the 10th inst.?

The clause in the lease is wrongly quoted. The tenant did not undertake to pay "all rates, taxes, assessments, charges, and outgoings," the word "impositions" being substituted for the words "charges and outgoings," and it was upon the word "impositions" that the action was based. Had the words "charges and outgoings" or either of them, been in the lease there could have been no defence. In Rawlins v. Briggs, and also in Tidwell v. Whitworth, it had been decided that the words, "taxes, rates, assessments, and impositions," did not enable the landlord to recover from the tenant, hence the judge's decision. We mention this because

possibly some one might be misled by the report as it now stands, which is our excuse for noticing it. ILMERMAUR CLARK & PARKER, Solicitors for the Defendant.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, EAST HAM.—A Congregational church, which has been erected in Wakefield-street, East Ham, was opened on the 10th inst. The church will seat between 700 and 800 persons, and has attached class-rooms for Sunday schools, &c. The cost, including site and partial furnishing, has been £4,800. The architects were Messrs. Gould & Paritt, and Messrs. Battley, Son, & Holness were the contractors.

WESLEYAN CHURCH, THE PLECK, WALSALL.—A new Wesleyan church has just been erected at the junction of Wednesbury and Darlston-roads, from the plans of Mr. C. W. D. Joynton, of Wednesbury, by Mr. W. T. Lees. The pulpit and stalls have been executed by Messrs. Jones & Willis, of Birmingham, and the organ is at present being built by Messrs. Nicholson & Lord, and the electrical fittings by Mr. P. U. Fellows. The electric light fittings were designed and manufactured by Mr. Walter J. Chesterton. The fittings in the nave and transepts are of wrought iron and polished copper, and those of the choir and chancel are polished brass, with copper leaves and flowers. The stained glass, with which the church is lighted, is the work of Mr. B. Jones, of Walsall. The church is cruciform, with a nave of 42 ft. span with transepts of 22 ft. span, and a gallery at the western end. At the eastern end of the church are the chancel, with seats for the choir, communion table at the rear of the chancel, with apsidal end, organ chamber, minister's vestry, with lavatory, &c., and choir vestry. Seating accommodation is provided for about 710 worshippers. At the north-west corner of the building is a square tower, in which is formed a staircase leading to the gallery, and at the south-west corner there is a staircase, likewise leading to the gallery. Provision is made for ventilating and lighting the building, and a hot-water apparatus on the low pressure system is also provided for heating purposes. The style is Gothic, and the tracery, windows, and dressings are executed in warm buff terra-cotta. The boundaries next the roads are fenced with dwarf walls and malleable iron palisades and gates. The pews and other fittings are executed in light oak. The total cost of the building has been about 7,000l, including the organ.

BOARD SCHOOLS, HANWELL.—New Board schools are to be erected at Hanwell from a design by Mr. W. Pywell, of Hanwell. The scheme provides for a total accommodation of 1,250 children—780 boys and girls in the mixed department, and 450 in the infants' school.

LABOURERS' COTTAGES, MIDLETON, CO. CORK.—A Local Government Board inquiry, conducted by Mr. Richard O'Brien Smyth, has just been held at Middleton into an application by the Rural Council for sanction to a loan of 32,600l. for the erection of 101 cottages under the Labourers' Act in the five dispensary districts of the Union—Aghada, Castle-martyr, Cloyne, Middleton, and Walshtownmore. Evidence was given by Mr. Richard Evans, C.E.

HOTEL, OXFORD.—A new hotel and restaurant has been built on the site of the old White Hart in Cornmarket-street, Oxford. Mr. Stephen Salters was the architect, and Messrs. Kingler & Son were the builders. The building will be lit by electricity, the installation being by Messrs. Hill, Upton, & Co.

ALMSHOUSES, TOTLEY BOTTOM, SHEFFIELD.—At Totley Bottom, on the 17th inst., the new almshouses were formally opened. The houses are three in number, and are to be occupied by old people selected by the trustees. The houses stand on the right-hand side of the road, about a mile from Dore and Totley Station, and are built of Dunford Bridge rocky stone, with Stoke Hall ashlars dressings, the roofs being covered with Broseley red tiles. They are in the English Domestic style, with bay windows in front. There is only one floor, and each house consists of two rooms and a combined pantry and scullery. To the south and east the houses are bordered by ornamental shrubberies, and behind there is a large stretch of garden. The area of the land used is about 2,000 square yards, freehold. Messrs. Hall & Fenton, of Sheffield, were the architects, and the contractor was Mr. Edmund Fox, of Bradway.

SKIPTON WORKHOUSE INFIRMARY.—The new infirmary at the Skipton Union Workhouse was opened recently. The building is of stone with inside brick lining. There are two stories, the block is between the four sick wards. A verandah faces the south and immediately in front of the administrative portion. There are four wards, two each on the ground and first floors, the dimensions being 36 ft. by 24 ft. each. Each ward will accommodate twelve beds, the total provision being for forty-eight beds. The administrative block is between the four sick wards, with which it is connected by 6-ft. corridors. There are the usual nurses' quarters, bathrooms and dayrooms, and general conveniences. The floors are of marble boards on cement concrete, supported on steel beams and joists. The plastering has been done with adamant plaster; the baths, lavatories, and

sanitary arrangements are by Messrs. Doulton & Co., Limited, Lambeth; the heating is effected by means of hot-water apparatus through radiators and coils of pipes. There are two boilers—one for heating purposes and the other for the supplying of baths, sinks, &c. Shorland's grates have been fixed, while extract ventilators on the roof are connected to each room by means of air flues and tubing. The amount of the accepted estimates was 3,850*l.*, but certain alterations and additions will bring the total cost to something like 4,500*l.* The contractors were:—Masonry, Mr. B. Kirk, Skipton; joiner's work, Mr. James Greenwood, Crosshills; iron and steel work, Mr. W. Fawcett, Skipton; plumbing, Messrs. H. Walker & Son, Bingley; plastering, Mr. T. Bailey, Skipton; slating, Messrs. R. Thornton & Sons, Skipton; hot-water fitting, Mr. T. Mears, Bradford; ventilating and stoves, Messrs. E. H. Shorland & Bro., Manchester. The clerk of works has been Mr. Sam Whitlam, Crosshills. The architect was Mr. James Hartley, of Skipton.

CHILDREN'S HOME, MOORTOWN, NEAR LEEDS.—The foundation stone of a children's home in Street-lane, Moortown, was laid on the 18th inst. Mr. Percy Robinson is the architect. Mr. J. T. Wright is the contractor.

SANITARY AND ENGINEERING NEWS.

SOUTH DARLEY WATER SUPPLY.—The South Darley Urban District Council have approved and accepted a scheme of water supply prepared by Mr. Harry W. Taylor, of Newcastle-on-Tyne and Birmingham. The supply will be from the springs issuing from the millstone grit measures, from whence it will gravitate to the whole of the district. The estimated cost is about 3,500*l.* Application to the Local Government Board for borrowing powers will be made at once.

FOREIGN.

FRANCE.—MM. Pascal, Loviot, Normand, Vaudremer, Courtois-Suffit, Scellier de Gisors, Adrien Chancel, Boeswilwald, Formigé, and Raulin, who had resigned membership of the Committee of the Société des Artistes Français (Old Salon) have all been re-elected by a large majority.—At the Ecole des Beaux-Arts the jury on the Laharre competition have awarded the prize to M. Coutan, pupil of M. Pascal. The subject was "A People's Palace."—The collection of church plate left by Baron Adolphe de Rothschild is to be arranged in a special room devoted to it in the Louvre, and to be called the Rothschild Gallery. The monument to Victor Hugo by M. Barrias is to be inaugurated on the Place Victor Hugo next month.—M. Alfred Newham, architect, of Lille, has been elected President of the Société Régionale de la North of France.—There is talk of restoring and setting in order the Château de Compiègne as a summer residence for the President of the Republic.—At Marseilles a large building is to be erected for the offices and stores of the Colonial Service.—The Chamber of Deputies has voted a sum of 100,000 francs in which the national archives are kept.—The Municipal Council of Paris has before it a scheme, presented by four eminent painters, MM. Gérôme, Detaille, Robert-Fleury, and François Flameng, to erect, on the site of the former Cirque de Champs Elysees, a building for the periodical organisation of private exhibitions and concerts. The design of the building will be entrusted to M. Grault, the architect of the Petit Palais. The occasion would be taken to remove from the Champs Elysees the Théâtre Marigny and the Palais de Glace, which occupy a great deal of space with no corresponding advantage.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Miller's Karti and Jarrah Forests, Limited, have recently opened a depot and saw-mills at Purfleet Wharf for landing and storage of building materials of all kinds.

THE SANITARY INSTITUTE.—The thirty-first course of lectures and demonstrations for sanitary officers is announced to be given at the Parkes' Museum during February, March, and April, commencing February 1. It includes four lectures on elementary physics and on chemistry, and twenty-one on public health law, duties of a sanitary inspector, municipal hygiene, building construction in its sanitary relations, &c.

TEES-SIDE MASTER BUILDERS.—The annual meeting of the Tees-side and District Master Builders' Association was held at the Masonic Hall, Stockton, on the 15th inst. Mr. T. Wilkinson, of Middlesbrough, was elected president, and Councillor T. E. Atterby (Stockton), Councillor Proud (West Hartlepool), and Mr. W. Bastiman (Middlesbrough) were appointed vice-presidents. Mr. W. C. Creason (Stockton) was re-elected secretary and treasurer. Mr. W. C. Creason, in his annual report, said, as a result of an advance in wages granted to the joiners in 1899 by the Stockton

Association, several conferences were held with the view of arranging one set of rules to apply to the whole district, the wages being 6*d.* per hour all round. This was successfully accomplished, and was regarded as one of the best pieces of work done by the Association, inasmuch as when any demands were made by the joiners they must be made to all towns alike and at one time, and must be dealt with by the Tees-side Executive Committee. The members' attention was also directed to the fact that practically the whole of the employees in the building trade in the district were combined in one federation. In May last the employees asked that non-union men should not be employed. The employers offered to assent to that if the men would agree to work only with associated masters. The men would not agree to that, and the negotiations fell through. The past few months had shown that the federation was not a federation in name only. The bricklayers in Newcastle having demanded an increase of wages, and that having been refused, they went out on strike. The Newcastle builders bore the burden for some time before appealing to the federation for assistance. Ultimately they appealed to the Northern Counties Federation, which ordered a lock-out of all bricklayers, and that had been carried out. The dispute had also been before the Yorkshire, Lancashire, and Cheshire Federation, and they had decided, failing a settlement, to lock out their men on February 2. It must, therefore, he generally conceded that the federation was endeavouring to justify its existence, and possibly now that it had shown that the workmen would see that the employers meant to be masters of their own business. As a result of the present lock-out the Executive Committee had had under consideration the advisability of endeavouring to induce the foremen to leave the men's union, and to substitute something equally beneficial. The foremen were in a delicate position, and it was hoped that a scheme would shortly be formulated for dealing with the matter. In conclusion, the report stated that it was perhaps too much to expect that the great prosperity in trade would continue very much longer, but it was generally felt that if the workmen could be brought to see that their interests were identical with those of the masters, and would give a fair day's work for a fair day's wage, there were every likelihood that both employers and workmen would have good prospects for some little time to come. Afterwards a meeting was held for all persons interested in the building trade, at which various subjects were considered. The annual dinner of the Association was held in the evening at the Masonic Hall, Mr. T. Wilkinson, Middlesbrough, presiding. Mr. A. Harrison proposed the toast of "The Tees-side and District Master Builders' Association." Mr. T. Wilkinson, the President, said they were engaged in a struggle the magnitude and extent of which they could not at present comprehend. They had hoped that a settlement might take place, and that reason and cool judgment would take the place of strife. They offered arbitration, and they were prepared to stand by that. So far as the Tees-side district was concerned, he believed all the members of the federation had stood staunchly together. Mr. T. Dickinson also responded. Mr. W. G. Roberts (Middlesbrough) gave the toast of "The Northern Counties Federation of Building Trade Employers." Alderman Rankin, of Sunderland (President of the Association), in responding, said the members of the federation were determined that builders should have something like justice and right. With regard to the present lock-out, they were exceedingly sorry that anything of the kind should take place. What could they do under the circumstances? The Newcastle employers were refusing to give way to an unreasonable demand of the men. The men would have followed their usual custom of attacking one town at a time, and as soon as they had conquered that they would have proceeded to another. There was no other course for the employers to adopt but to amalgamate in order to resist such tactics. Mr. W. H. White (President of the Sunderland Association), who also replied, said it was a fact that imperfect organisation, coupled with the fact that the other side was so well organised and led by such capable leaders, had forced upon them the necessity of federating themselves. It had brought home to them the knowledge that the small local organisations were utterly incapable of resisting unjust demands made by the men, and it was only by combined action in extended areas that they could cope with the men. Mr. B. Dickinson proposed the toast of "The Architects and Surveyors," and Messrs. E. Whipham and A. Newsome responded. Other toasts followed.

GLASGOW HIGH SCHOOL CONSTRUCTION CLASSES.—On Saturday afternoon, the 13th inst., the students of the High School Building Construction Classes, under Mr. D. Bennet-Dobson, visited the buildings of the Glasgow International Exhibition. The party, which numbered about seventy, were conducted through the various buildings by Mr. White, clerk of works. Commencing at the Industrial Hall, the Indian and Burmese sections were first visited. The company's attention was drawn to the delicate and intricate carrying of the stalls and the difference between the work of the Indian and Burmese carvers. The exit close by gave a fine demonstration of the automatic arrangement of the

revolving shutters. The main roof of the Industrial Hall has a span of 103 feet, and it is designed, as was pointed out, on the three-binged principle, so as to counteract any evil effects caused by expansion and contraction of the metal. The feet of the trusses are supported by steel pins, fixed to bed-plates, which are securely bolted to the concrete foundations, the other pin being at the centre of the truss near the ridge. The party then visited the dome, which is 80 feet in diameter and 100 feet high. Instead of being supported by the steel pins which were originally intended to carry it, steel being so difficult to obtain at the time, timber was adopted, and the construction of the four massive L-shaped piers proved an excellent object-lesson in timber construction. The company then passed down the Grand Avenue, which is 1,000 ft. long by 75 ft. broad, and curved on plan. The roof, rising to a height of 40 ft., is formed of semicircular laminated ribs, 15 ft. centre to centre. The central portion of the ribs is in three thicknesses of timber, while the ends are in five thicknesses. The bridge across the Dumbarton-road was next examined, and, as explained by Mr. White, is on the cantilever principle. The cantilevers are supported on cast-iron columns, and the necessary back weight obtained by large concrete blocks. The Machinery Hall, which was next visited, covers a large area, and is roofed by five roofs. A central span of 108 ft. is braced by elliptical-shaped trusses supported at intervals of 8 ft. by double columns, and the space between these again spanned by curved lattice girders. Two roofs of timber construction flank either side. After having been shown all the points of interest in the Machinery Hall and having been conducted round the various detached buildings, the party passed a vote of thanks to the architect, Mr. James Miller, Glasgow, for his kindness in granting permission to visit the building, and also to Mr. White for his interesting and instructive way in which he conducted the party.

FIRE PREVENTION AT THE BUILDING TRADES EXHIBITION.—In further reference to the special "Fire-Proofing" Section at the Building Trades' Exhibition which is being organised under the auspices of the British Fire Prevention Committee, the Executive of this body, at a meeting last week, decided to invite numerous representatives of the municipal, technical, insurance, and industrial interests concerned to visit this elaborate demonstration of means and ways for reducing the modern fire risk. Among those to whom invitations are being issued are the provincial Chairmen of Works Committees, Engineers of the large Dock and Railway Companies, principals and masters of the technical colleges and polytechnics, &c. Special arrangements are being made by which the visitors will have every facility for studying the subject, and the committee will, no doubt, also entertain at their new Testing Station at Westbourne Park. A sub-committee has been appointed to take charge of matters relating to the Section, comprising Mr. F. Hammond (chairman), Mr. Max Clarke, Mr. Frederic R. Farrow, Mr. Charles E. Goad, Mr. Ellis Marsland, and Mr. Edwin O. Sachs, with Mr. H. Montgomery as business manager. Particulars of the general arrangements are obtainable from the committee's offices at No. 1, Waterloo-place, Pall Mall, S.W.

YORKSHIRE MASTER BUILDERS AT DINNER.—The annual dinner of the Yorkshire Federation of Building Trade Employers was held on the 17th inst., at the Queen's Hotel, Leeds. A company of between 130 and 150 assembled, and Mr. James Longden, of Bradford, presided. After the loyal toasts had been honoured, Mr. S. Smethurst proposed "The Yorkshire Federation," observing that the great object of their organisation was not to promote industrial war. They ought to look upon strikes and lock-outs as being something in the nature of a calamity. Sometimes they might be inevitable, but his impression was that largely they were the consequence, not of any real difference so much as of misunderstanding, and he thought that in proportion as they built up a strong, solid, intelligent combination on their side, they would find that something similar existed on the other side, and by mutual discussion, and by mutually trying to understand each other, many points of difference would be removed, and what in other circumstances might have led to disastrous conflicts would be met by discussion and argument. Referring to the strike of bricklayers on Tyne-side, he reminded them that there was no town in England that paid more to the men, and the attempt to get an advance from 10*d.* to 1*1d.* per hour, was in his opinion to be made a pivot to raise the standard wage throughout the country to 1*1d.* He was glad that at this moment the better sense of the country had prevailed, and practically the claim at Newcastle was withdrawn. There were certain technicalities to be completed, but the principle was withdrawn, and unless something happened that they did not at this moment foresee, practically that struggle was brought to a close, and the stern measure that a week ago they should have been compelled to resort to had been averted.—The President, in reply, expressed the opinion that the workmen were beginning to find that they would have to go to work in a more genteel manner, and be more reasonable in their demands. Of course, the employers had to find the money and the brains, and of late the workmen had wanted to tell them how that money

was to be spent, and how far they would like to put their hands down into their pockets. They wanted to try and alter that, and it could only be done by the united action of every employer in the building trade, and by their doing everything they could to assist the Federation to resist the unfair attacks that were made upon the masters in many ways. They must expect the men to give a fair day's work for a fair day's wage. If they were to maintain their position, they must be united. In that event he had no doubt they would have better times, and make their business more successful and remunerative.—Mr. G. H. Walters (Hull) and Councillor Mansfield (York) also responded. Mr. Walters, in the course of his reply, alluded to the scheme to raise a special fund for special work. He said they paid fifty millions a year in wages in the building trade, and if they only paid 3d. per 100l. of wages in this special fund they would have an income of 7,500l.

This matter was to come before the National Federation, and he trusted it would have the hearty approval of every employer, and then they would have a respectable sum behind them to combat the tyranny of the men and to go in for organisation throughout Great Britain.—Mr. W. R. Thompson (Dewsbury) next gave "The Northern Counties." He pointed out that they had an instance in Tyneside where a strong association had been unable to deal with a serious labour trouble. If the Newcastle Federated Masters had been left to deal with the trouble by themselves they would probably have come off second best. They, however, brought the difficulty before the Northern Centre, who came to the conclusion that it was desirable to help them. The impending lock-out had, they hoped, been averted. Their thanks were due to the Northern Centre for the tact and ability with which they had managed the business.

—Mr. R. Hislop (Newcastle) and Mr. E. Goode (Hull) responded. "The City and Trades of Leeds" was given by Councillor Clegg (Sheffield), and acknowledged by Mr. W. H. Dewar (Sheffield) submitted the toast of "The Architects and Surveyors," which was acknowledged by Mr. W. S. Braithwaite and Mr. G. F. Bowman.

CROYDON HURST PRESERVATION.—The Croydon County Council has decided to purchase the whole of the wooded hill to the south of Croydon known as Croydon Hurst. Two years since successful negotiations resulted in the acquisition of thirty-five acres, and public attention was drawn to the fact that the most lovely portion of all the remaining forty-five acres, was threatened with spoliation by the builders. As a result of an open-air meeting on the top of the Hurst on January 22, 1899, an influential committee of seventy members was formed to request that the whole eighty acres might be devoted to the use of the public for ever. This object has now been achieved, inasmuch as the Council has decided to offer the sum of 15,000l. for the remaining forty-five acres.

THE INSTITUTION OF JUNIOR ENGINEERS.—On Saturday, the 12th inst., a large party of members of this Institution visited the works of Messrs. W. T. Henley's Telegraph Works Company at North Woolwich. The various processes in connexion with the manufacture were seen in operation, and fully explained by the members of the staff. The business was founded about fifty years ago by the late Mr. W. T. Henley, and up to the time of his death, which occurred in 1882, the works were devoted almost exclusively to the construction of submarine telegraph cables and underground telegraph lines. Since then the business widened into other channels, until at the present day the cables manufactured embrace every type used for telegraph, telephone, electric light, and electric power purposes. Many of the huge reels now turned out at the company's works contain a cable of a design which was unknown at the time of the founder's death. Telephone cables, which were originally made with gutta-percha insulation, are now insulated with vulcanised india-rubber, and hundreds of miles of wire, of the well-known dry-core cable with paper insulation, are produced weekly. Large quantities of india-rubber and gutta-percha are always in process of being cleaned and prepared for insulation purposes; each operation is carried on in a crude condition, being received from abroad in a crude condition. The new buildings which have been erected on the river front comprise large electrical testing-rooms, forming an important feature of the works, each order executed having to pass stringent electrical and mechanical tests. The greater part of the machinery is driven by electric power, and every new workshop opened from time to time is run by this means. The works themselves give employment to over 1,000 hands, and there is also a large staff engaged outside in connexion with the laying of cables, &c.

CAPITAL AND LABOUR.

BIRMINGHAM BUILDING TRADE DISPUTE.—The difficulty that had arisen respecting the working hours of builders' labourers in Birmingham has been amicably settled. On the morning the employers gave notice to the workmen's section that in future they would require the labourers to commence work at the same time as the workmen they were assisting—carpenters, masons, or plasterers. The men asked

for a rise of a halfpenny an hour, and the matter has just been considered by the wages board. The men connected with the National Association of Gas-Labourers and General Labourers and the Federated Employers' demand would be that builders' labourers, except those working for plasterers, would work half an hour less per day than at present, and they wanted this made up in higher wages. The employers replied that their only object was to alter the hours of the men assisting the plasterers. At present the labourers start half an hour later than the skilled workmen—a very inconvenient arrangement. Carpenters' and masons' assistants would in no way be affected by the proposed change. The men's representatives were satisfied with this explanation, and signed an undertaking that this class of men should start at the time required, and the notices on both sides were withdrawn.—*Birmingham Post.*

COVENTRY BUILDING TRADE.—The men engaged in the building trade in Coventry have received from the Master Builders' Association notice of a proposed reduction of wages, to come into force on April 1.

THE NORTHERN BRICKLAYERS' STRIKE.—There is every probability of the strike of bricklayers on Tyneside being settled at an early date. It will be recalled that in the spring of last year the men applied for an advance of wages from 10d. to 11d. per hour, but that it was refused. The employers, however, offered to refer the matter to arbitration. This was refused by the operatives, and the strike commenced in May, and has continued till now. Practically the whole of the men found work elsewhere, and their removal caused a cessation of work in the federated shops of Newcastle and district. The votes cast in the ballot just taken of the Northern bricklayers with reference to the two propositions of the employers for the termination of the lock-out, viz., arbitration, or a guarantee of the present wages for two years, were counted on Saturday last week at Newcastle. The result was despatched to the London office of the Bricklayers' Union without being communicated to the branches. It is believed that a majority will be shown for arbitration, though as a protest against the action of the Executive Committee many papers were returned blank.

LEGAL.

IMPORTANT POINT UNDER THE LONDON BUILDING ACT, 1894.

THE case of *Moses v. Marsland* came before a Divisional Court of Queen's Bench, composed of Justices Bruce and Phillimore, on the 17th inst., on an appeal, by way of special case stated, from the decision of a Metropolitan police magistrate ordering the appellant to comply with a notice served on him by the District Surveyor for Camberwell (the respondent) under the provisions of the London Building Act, 1894, requiring him to do certain things, or certain alterations, to the Managers of the Metropolitan Asylums District at a building in Elm-grove, Peckham.

The facts were these:—By an order of the Local Government Board, dated April 2, 1897, the care of children of weak intellect or physical infirmity incapable of being trained in association with children in ordinary schools was placed in the hands of the Managers of the Metropolitan Asylums District, who, to carry out the order, prepared a scheme for purchasing various dwelling-houses in different parts of London adjacent to schools specially provided and staffed by the London School Board for the education of these children. Under the scheme the children had to live, sleep, and board in such houses under the care of a matron, in numbers generally not exceeding fourteen in any one house, and to attend such special Board schools each day for the purpose of their education. The houses were intended as permanent homes for the children. The house in question, No. 16, Elm-grove, had been an ordinary detached dwelling-house of two floors, with one room and a basement below, and this had been purchased by the Managers under the scheme, who instructed the appellant under the supervision of the Board's Architect to alter or convert the dwelling-house to make it suitable for the accommodation of twelve to fourteen children and a matron, cook, and housemaid. The total cubical capacity of the dwelling-house was under 50,000 cubic feet, with sleeping accommodation as above. The appellant, before he commenced the work, served a notice on the respondent giving him notice that he was about to make alterations in the above dwelling-house and convert it into a public building, and thereupon the respondent served notices on the appellant making certain requirements with regard to the staircase and the height of the rooms, &c. The only question before the magistrate was whether the building in the above circumstances was a "public building" within the meaning of the London Building Act, 1894, Sections 5 (27), 68, and 70. The magistrate held that the building was, in the hands of the Managers of the Metropolitan Asylums District, used or constructed or adapted to be used for a public purpose, and made the order asked for by the respondent.

Mr. Mansergh, Q.C. (Mr. Herbert Smith with him), for the appellant, submitted that the building

in question did not come within the definition in Section 5 (27) of the Act. The test was whether the building was intended to be used for a public purpose similar to those enumerated in the section, and the section did not apply to a mere dwelling-house, though placed under the control of a public body.

Mr. R. C. Glen, for the respondent, contended that the magistrate's order was right, and that the building was a "hospital" within the meaning of the section.

Mr. Justice Bruce, in giving judgment, held that the building in question was not a public building within the meaning of the section of the Act of 1894. He did not think that the building could be considered as a hospital in that sense, nor was the building within the section on the ground that it was a building used for "any other public purpose." Again, the building did not come within the term "home," because it had not a cubical capacity of 250,000 cubic feet or sleeping accommodation for 100 persons. His Lordship therefore thought that the magistrate came to a wrong conclusion, and that the appeal must be allowed.

Mr. Justice Phillimore concurred, and the appeal was accordingly allowed with costs.

USE OF GUY-ROPE IN HOISTING ;

WHEN DOES ITS ABSENCE CONSTITUTE NEGLIGENCE ?

AT Brompton County Court on Monday, before Judge Stonor and a jury, Alfred Crow, a builder's labourer, 13, Riley-street, Chelsea, sought to recover damages from his former employer, Mr. Joseph Pratt, contractor, Lots-road, Chelsea, the claim being in respect of personal injuries said to have resulted from negligence on the part of the defendant. The action had been remitted from the High Courts, and the proceedings were taken under Common Law.

Mr. J. W. Moyes, counsel, appeared for the plaintiff, and Mr. Arthur Powell, counsel, defended.

Counsel for the plaintiff explained that on July 2 last his client was engaged by the defendant to assist in unloading a barge of deals at Chelsea Wharf, Lots-road, and to place them in railway trucks which were drawn up by the side of the barge. For the purpose of hoisting the timber a steam-crane was used. A number of deals were attached to the end of the wire rope by which they were drawn up from the barge, and then they were swung round until over the railway truck, into which they were guided by the plaintiff and another man. Some deals had just been hoisted, and, as the plaintiff was waiting to receive them in the truck, they swung round, striking the unfortunate fellow and causing him to fall to the ground. His injuries appeared to be of practically a permanent character. It was now maintained that the defendant was guilty of negligence in not providing a guide-rope, technically termed a guy-rope, by which to steady the timber and prevent it from swinging round.

Mr. William Robert Pether, consulting engineer, Basinghall-street, E.C., stated that he had had a considerable amount of experience in the work of hoisting timber. He contended that a wire rope would be likely to cause long lengths of timber to swing round more than if an ordinary chain were used on the crane. He also maintained that when hoisting deals or other long pieces of timber, a guy-rope should be used to prevent the timber from unduly swinging round; otherwise he considered that the work would be dangerous.

Cross-examined: It was the usual practice in the trade when hoisting timber by a crane, to use a guy-rope. He was not aware that any different method was adopted at Folkestone, Newhaven, or Harwich.

Mr. Christopher Richard Griffiths, architect and surveyor, said that he also had had experience in the work of hoisting timber by means of a crane, such as the one in question. He agreed that it was usual to use a guy-rope for the work.

Cross-examined: He did not think that a guy-rope would be likely to get in the way and to interfere with the work; on the contrary, he considered a guy-rope to be quite necessary for the work.

The plaintiff then gave evidence. He bore out his counsel's opening statement, and added that at the time of the accident he was receiving wages at the rate of 7s. 6d. a day. Owing to the accident, he had been unable to do any hard work since.

Mr. Felix Charles Kempster, M.R.C.S., &c., described the man's injuries, which were of a very serious nature. For the defence, Mr. Albert Penthall, M.R.C.S., &c., and Mr. J. Edlin, F.R.C.S., &c., gave evidence implying that plaintiff's injuries had been exaggerated.

The defendant was then called. He said that he had had some twenty-five years' experience in using cranes for hoisting timber, and he maintained that for such work it was not usual to provide a guy-rope. Sometimes a guy-rope was used on a hand crane, but only for the purpose of helping to draw the timber round to any place required. He had never seen a guy-rope used on a steam crane like the one in question.

Cross-examined: On another crane at the same wharf they used a guy-rope but this was for moving the jib round, and not for steadying the timber.

Re-examined: Cranes were now generally fitted

with wire rope instead of a chain for drawing the loads up, the wire taking the place of the chain because it was better for the purpose.

Mr. Joseph Henry Pratt, son of the defendant, said that he had never seen a guy-rope used in connexion with a steam crane.

The Judge: Do these wire ropes make the timber turn round more than the chains?—The Witness: No, sir?

Mr. William Thomas Andrews, engineer to the Regent's Canal Company, stated that he had never seen a guy rope used when hoisting deals by a crane, although one was sometimes provided when pulling up large baulks of timber, 30 ft. or 35 ft. long. On wooden cranes, particularly in Quebec, guy-ropes were used to pull the jib round, so as to get the timber at the spot required.

Henry Frye, the driver of the crane in question, said that he had been accustomed to working steam cranes for the past thirty years and had never seen a guy-rope used in connexion with them, except for large baulks of timber.

Cross-examined: He believed that the plaintiff, at the time of the accident, was not in his proper place.

George Butcher, another man working on the job, gave similar evidence.

Mr. Pether and Mr. Griffiths, re-called, both said that when the witnesses for the defence spoke of a rope used for pulling the "jib" of the crane round, they appeared to be referring, not to a guy-rope, but to a "trail-rope."

The jury found (1) that a guy-rope was frequently and generally used for steadying timber when it was being unloaded; (2) that the absence of a guy-rope in connexion with a steam crane, under circumstances like those in question, was dangerous; (3) that the absence of a guy-rope in the present instance caused the accident. This was a verdict in whose favour the jury assessed the damage at £31. 10s., being £31. 10s. for wages and sol. for pain and suffering.

His Honour gave judgment accordingly, and allowed costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

19,070.—A CIRCULAR SAW GUARD: S. Drew.—On a bracket fixed behind the saw-bench is clamped a plate made of steel or other metal which (its bevelled-off edge excepted) is thicker than the saw. The saw's front is protected with an extension piece that is bolted on to the plate, and has a roller that will run upon the wood.

19,089.—AN APPLIANCE FOR VENTILATION: H. W. Roberts.—The ventilator is adapted for use with a partly-opened window, and admits air from without through an opening whose areas are gradually enlarged. Side brackets support a blind of some textile material, stained glass, &c., and at the bottom is a curved plate fitted with a reflecting lip, a screen being carried by slats mounted upon hooks.

19,116.—GLASS FOR DECORATIVE PURPOSES: Soc. Anon. Belge pour La Fabrication des Encaux Artistiques.—For giving a roughened back to glass slabs, mirrors, &c., and rendering them specially applicable for wall decorations, plinths, panels, wainscoting, and so on. Fragments of glass and white sand are put into the moulds before the material is poured in, so that they shall partly melt, and adhere to the slabs or plates when the moulds are heated in a furnace to high temperature; when the moulds have become cool the slabs or plates will have acquired a roughened back surface.

19,134.—A DOOR HINGE: C. Porter and F. D. Bishop.—The inventor's object is to provide means for folding an opened door behind the jamb; at the end of a tongue, which projects from the door-plate, is a pin turned downwards into a socket in an angle-plate, which is secured at the corner of the jamb; a slot in the angle-plate gives room for the tongue's movement, and the pin can be raised out of its socket by means of another recess in the plate; in a variant form of the device the relative positions of the socket and pin are interchanged.

19,142.—AN APPLIANCE FOR USE WITH DRAWING BOARDS: H. W. Roberts.—With this contrivance a drawing-board can be turned or set at an angle about the table. To its underside is screwed a square piece on to which is secured a cross-piece which joins the two side pieces that constitute a rest for the board, the square piece being arranged so that it may turn freely around the screw which joins it to the cross-piece. For protecting the table, grooves are cut in the cross-piece and inlaid with india-rubber.

19,168.—CONTINUOUS KILNS: H. R. Vaughan.—The kilns for drying and burning bricks, terra-cotta, pipes, other clay goods, and cements and limes are after the kind specified in No. 20,540 of 1895. In order to more efficiently distribute amongst the freshly-charged chambers the hot gases after their withdrawal from the fired chambers and their circulation amongst the "green" goods, their free delivery over the floor surfaces is effected by means of branch flues leading from the middle hot-air flue to beneath the perforated floors of the chambers. Over the chambers and communicating with them are disposed other branch flues whose connexions with the central main flue and the

hot-air flue are regulated by dampers. The working of the dampers will draw steam from the "green" goods as they are being dried, through the branch flues and the main flue, which is joined to the chimney flue and the chimney, and will direct the hot gases from the burned goods through some of the branch flues into the hot-air flue, and thence into the chambers in which "green" goods are stored. The burning capacity of the kiln can be increased with portable fire-grates or furnaces inserted into openings made in its side walls. The goods may be dried before they have been reached by the sulphur-laden fumes issuing from the chambers that are being fired. The middle main flues and walls are built along the kiln's entire length, and provision is made for the flow of hot gases through passages in the end chambers in the shape of a connexion between the hot-air flue and the cross flues.

19,177.—MILLS FOR THE MANUFACTURE OF CEMENT: H. Bing.—For grinding and crushing clinker and other materials used in the manufacture of cement are devised reciprocating plates having corresponding ridges or corrugations (set transversely in respect of the direction of their motion) fashioned upon their working faces. The upper plate is attached to a frame that is moved with a rod and eccentrics or cranks; the lower plate is secured to a bed-plate, the frame being forced downwards with springs that press against a girder which forked links retain against the bed-plate. The machine may also be constructed with its reciprocating frame mounted upon rollers, and a hydraulic cylinder acting through a roller beneath which the frame travels backwards and forwards may be used for forcing the frame downwards. In the case of an extended plant for diversifying cement-clinker and for treatment at successive stages of the material a series of the mills described can be employed.

19,197.—TREATMENT OF SEWAGE, FOUL WATERS, &c.: J. Brightmore, T. Swann, and F. S. Goodwin.—The plant comprises an anaerobic tank and two aerobic tanks, whereof the former is fitted with a set of pierced trays which carry the filtering media, and has an air-tight cover with an outlet through which gas and air may escape; filtering materials, such as coal and limestone, or coke, are laid in alternate courses upon pierced partitions arranged inside the two other tanks, from which pipes pass to the former tank; whilst one aerobic tank of a set is at work the other similar tank remains at rest, and during the intervals of rest the ration of the filtering substances can be effected by means of valves at the bases of the aerobic tanks.

19,287.—MANUFACTURE OF BRICKS: J. P. Fiske.—The inventor furnishes means of carrying bricks in the course of their making, so as to avoid their being frequently handled, together with an improvement in kilns. After the moulded bricks have been stacked upon trucks (which are run on to other trucks and thence into a drying chamber), they are transported to slotted stands, from which a travelling crane, mounted upon rails, carries the larger stacks (made up of smaller stacks) to the burning-kilns; injury of the soft "green" bricks is obviated by piling the small stacks upon a bottom layer of burned bricks placed on the stand, whose slots are equal in size to the slots in the kiln's floor which take the cross beams which carry the beams to which the lifting-chain of the crane are hooked; the kilns forming a series below the ground level have pits or flues in their floors which take the cross-beams, the cross-beams being drawn away when the bricks have been laid down, and the kiln chambers are closed with loose covers of hollow tiles joined with tie-rods to one another; the withdrawal of the beams is facilitated by means of openings in the partition walls between the chambers, which are ranged in alignment with apertures through which the gases pass from chamber to chamber, and the openings are closed, under normal conditions, with stop-blocks made of terra-cotta.

19,295.—COUNTER-SEATS FOR USE IN SHOPS: C. P. Evans & J. H. Hawksworth.—To the partition of a counter is fixed with lugs a tube, within which is a spindle that carries a block joined with a rail to another block having projections on its sides. The two parts of the seat, which can be folded, are hinged on to rods which join the two blocks, so that it may swing upon the spindle sideways, and be retained by the fall of the wedged portion of the first-named block into one of two notches which are cut in the tube's top. When the two portions of the seat are horizontal they rest upon the projections of the latter block and abut against the other block.

19,318.—SCREW UNION OR JOINTING OF PIPES: J. Gisholm.—A screwed coupling for screwed steam, water, gas, or other pipes of metal consists of a sleeve or socket piece to be screwed on to the pipes, which is fashioned with a bevelled socket that takes the packing, which is pressed together with a bevelled and screwed gland. The gland may be turned square, as it is described in No. 23,992 of 1893, or its plain part may be formed separately from its nut portion. In the former case a loose bevelled washer should be placed between the packing and the end of the gland. The invention is stated to be applicable to taps, cocks, valves, and similar fittings.

19,328.—FLOORING CRAMPS: J. Woodhead.—The ram is guided by a saddle that rests upon the joist, and has legs to which are pivoted

two dogs, to the ram is affixed a crossbar on to which a forked operating-lever is pivoted, and the lever is also pivoted to links that join the arms of the dogs. When the lever is pulled about its pivot upon the crossbar it presses the dogs against the joist, then—as it turns about its pivot upon the links—it impels the ram so as to clamp the floorboard. The cramp is retained in its place by means of a hinged stay as the board is being nailed down.

19,358.—BLOCKS OR SHEETS FOR FLOORS, PATENTERS, &c.: C. J. R. Le Mesurier.—A pavement or flooring which is claimed to be noiseless and elastic is made of a compound of moss-litter and some bituminous substance—such as tar, asphalt, creosote residues, or india-rubber, or some other resinous material, to which may be added, at option, brickdust, sand, or some such substance. The compound is made under pressure.

19,361.—A FLUSH FOR PRIMING, PAINTING, AND VARNISHING PURPOSES: A. E. Lefebvre.—An admixture which is intended for use also as an anti-corrosive and for the prevention of rust, is made of liquid wood, refined resin, tar, yellow colophony, and carbon bisulphide.

19,458.—COFFER-DAMS: A. D. Garretson and W. W. Brown.—In the case of crib-work coffer-dams for abutments, breakwaters, and similar structures, the inventors join together vertical metal plates with angular rails that are riveted on to them, forming tongue-and-groove joints with one another; to the rails are riveted cross-bars which join together opposite plates, and diagonal braces strengthen the end plates; a filling of stone, concrete, earth, &c., is used, and a plank floor is laid over the plates and bars or stringers.

19,587.—SISSONIAN DISCHARGE: T. G. Rhodes and B. Grant.—At the top of the discharge pipe is mounted a cup that is joined, by means of its radial wings, to a conical and smaller cup into which the siphon's longer leg is fixed. Over the two cups and surrounding the leg is a valve. When that valve is lifted the flush is started by the entrance of water into the discharge pipe through the rounded space between the two cups.

19,628.—VALVES FOR DOMESTIC WATER-SERVICE PIPES: E. G. Watrous.—A controlling valve comprises a cylinder, which is supported by a piston-rod, the cylinder's lower end pressing against a valve-seat and also against the flange of the principal valve which rests against its seating. A flange is screwed upon the rod's lower end, and within that rod is a hollow tube that will move through a little distance, and is fitted at its upper end with a time screw and aperture, as well as with a nut which presses upon an upper valve-seat and a spring into the cylinder. A rocking-lever, which is worked by the hinged closet-seat, is linked to the tube's lower end; a depression of the seat turns the lever upwards, whereby the valve rises to allow a flow of water from the chamber which surrounds it, and the rod, together with its valves, will also rise; in the end, the flange around the rod's lower end shuts the outlet. When the lever returns downwards, the upper valve becomes shut, and the rod descends slowly with the admission of air or water into the chamber through the time passage at its upper end.

19,678.—LIGHTNING CONDUCTORS: K. W. Hedges.—For joining together the various portions of the conductor a trough is made around a tinned part of the conductor and its connecting portion, point, &c., Lower Abbey-street, 29 p.m.

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MEETINGS.

FRIDAY, JANUARY 25.

Architectural Association of Ireland (Technical Demonstrations).—Mr. T. Bain on "Drainage" (at 12, Lower Abbey-street, 29 p.m.).

Glasgow Architectural Craftsmen's Society.—Mr. J. M. Arbuthnot on "Legal Points relative to Building," 8 p.m.

SATURDAY, JANUARY 26.

St. Paul's Ecclesiastical Society.—Annual meeting, the Chapter House, St. Paul's, 2.30 p.m.

Builders' Foremen's Association (Memorial Hall, Farringdon-street, E.C.).—Monthly meeting, 8 p.m.

London Institute of Architecture.—Visit to St. Luke's Church, E.C., West Ferry.

MONDAY, JANUARY 28.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's," 4 p.m.

Surveyors' Institution.—Adjourned discussion on Mr. R. E. Middleton's paper on "The Future of the London Water Supply," 8 p.m.

TUESDAY, JANUARY 29.

Royal Institution.—Professor J. A. Ewing, M.A., F.R.S., on "Practical Mechanics (experimentally

treated): First Principles and Modern Illustrations.—III. 3 p.m. Society of Arts (Applied Art Section)—Mr. Hugh Stanbury on "Some Examples of Romanesque Architecture in North Italy." Mr. T. G. Jackson, R.A., will preside. 8 p.m.

WEDNESDAY, JANUARY 30.

British Archaeological Association.—Mr. R. H. Forster on "The Roman Wall." With limelight illustrations. 8 p.m. Society of Arts.—Mr. P. T. Macquoid on "Evolution of Form in English Silver Plate." 8 p.m. City of London College Science Society.—Mr. H. Williams, A.M.I.M.E., on "Refrigeration and Cold Storage." 7.30 p.m. Northern Architectural Association.—Mr. Allan Greenwell on "Bitumen: its Application in Architecture and Engineering." With lantern illustrations. 7.30 p.m.

THURSDAY, JANUARY 31.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." 11. 4 p.m. Society for the Encouragement of the Fine Arts.—Mr. R. Phœnix Spier, F.S.A., on "Greek Architecture." Limelight illustrations. 8 p.m.

FRIDAY, FEBRUARY 1.

Architectural Association.—Mr. D. T. Fyfe on "Great Architecture." 7.30 p.m. Sanitary Institute (Lectures for Sanitary Officers)—Dr. E. J. Stegmann on "Mechanical Physics, Laws of Motion, Hydraulics, &c." 7 p.m. Royal Institution.—The Rt. Rev. Monsignor G. Molloy, D.D., on "Electric Waves." 9 p.m. Architectural Association of Ireland (Technical Demonstrations)—Mr. B. A. Phillipson on Electricity, &c. (at 10, Lower Baginot-street). 4.30 p.m.

SATURDAY, FEBRUARY 2.

Sanitary Inspectors' Association.—Eighteenth Annual Dinner, Holborn Restaurant. 6 p.m. British Institute of Certified Carpenters.—Monthly meeting, Carpenters' Hall. 6 p.m.

SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.

January 15.—By BRADSHAW, BROWN, & CO. Stratford—31 to 45 (odd), Abbey-lane, ut. 65 yrs., g.r. 241. £1,060 By W. R. NICHOLAS & CO. Hornsey.—High-st., Eagle House, area 33,000 ft., l., r. 801. 2,000 By ALEX. PHILLIPS & CO. Kilburn.—51, Tennyson-rd., l., r. 381. 525 6, Mareton-av., ut. 66 yrs., g.r. 101, 104, g.r. 601. 550 Willesden.—33, Leopold-rd., ut. 94 yrs., g.r. 51, 1 to 9 (odd), Oldfield-rd., ut. 68 yrs., g.r. 111. 1,500 January 16.—By R. TINSLEY & SONS. Islington.—2, Oakley-rd., ut. 37 yrs., g.r. 5, 10s., g.r. 501. 560 By HOBSON, RICHARDS, & CO. Dalston.—37, 45, and 47, Malvern-rd., and 52, Shrubland-grove; also 124, 125, 126, 6d., ut. 401 yrs., g.r. 271, 58, l., 133. 1,300 Hackney.—2 and 7, London Fields; also 1 g.r.'s 124, ut. 41 yrs., g.r. 171, 173, 6d., r. 631. 670 January 18.—By TINSLEY & SONS. Oxford-street.—No. 538, ut. 314 yrs., g.r. 57, r. 2101. 2,050 Southwark.—46, Southwark-st., ut. 443 yrs., g.r. 1404, r. 4401. 4,700 By BLAKE & DANFORTH. Holloway.—32, Freggover-rd., ut. 66 yrs., g.r. 71, 108, r. 441. 530 By LEONARD FAIRER & SONS. St. John's Wood.—71, Carlton-hill, ut. 60 yrs., g.r. 111, 118, g.r. 801. 720 By A. J. SHEPHERD. Stepney.—Eastfield-st., No. 1, g.r. 154, reversion in 19 yrs. 360 Old Ford.—32 and 34, Roman-rd., ut. 44 yrs., g.r. 501, g.r. 3501. 1,330 Canning Town.—30 and 32, Nelson-st., f. 380 2, Emily-st., f. 105 Barking, Essex.—9 to 15, Grove-place, ut. 812 yrs., g.r. 281. 640 Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; s.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table with 2 columns: Material Name and Price. Includes items like Hard Stocks, Rough Stocks, Bright, Facing Stocks, Shippers, Flettons, Red Wire Cuts, Best Farchem Red, Best Red pressed, Ruabon Facing, Best Blue Pressed, Staffordshire, Do., Bullnose, Best Stourbridge, Fire Bricks, GLAZED BRICKS, Best White, Ivory Glazed, Stretchers.

PRICES CURRENT (Continued).

Table with 2 columns: Material Name and Price. Includes items like BRICKS, &c., Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Glazed Stretchers and Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sided Salt, Best Dipped Salt, Splays, Chamfered, Squints, Second Quality, White and Dipped, Salt Glazed, Frames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Liais Lime, Grey Stone Lime, Stonbridge Fire-clay in sacks.

STONE.

Table with 2 columns: Material Name and Price. Includes items like Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Gainshill, Brown Portland in blocks, Darley Dale in blocks, Red Corsehill, Red Mansfield, Hard York in blocks, Hard York 6 in. sawn both sides, landings, to sizes s.d. (under 40 ft. sup.), 6 in. Rubbed Ditto, 3 in. sawn both sides slabs (random sizes), 3 in. self-faced Ditto.

SLATES.

Table with 2 columns: Material Name and Price. Includes items like 20x10 best blue Bangor, best seconds, 16x8 best, 20x10 best blue Portmadoc, doc, 16x8 best blue Portmadoc, 20x10 best Eureka un-fading green, 16x8, 20x10 Permanent green, 16x8.

TILES.

Table with 2 columns: Material Name and Price. Includes items like Best plain red roofing tiles, Hip and valley tiles, Best Broseley tiles, Hip and valley tiles, Best Ruabon Red, brown or brindled Do. (Edwards), Do. ornamental Do., Hip tiles, Valley tiles, Best Red or Mottled Staff-fordshire Do. (Peakes), Hip tiles, Valley tiles.

WOOD.

BUILDING WOOD—YELLOW.

Table with 2 columns: Material Name and Price. Includes items like Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in., Deals: best 3 by 9, Battens: best 2 1/2 in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in., Deals: seconds, Battens: seconds, Fir timber: Best middling Danzig or Memel (average specification), Seconds, Small timber (8 in. to 10 in.), Swedish balks, Pitch pine timber (35 ft. average), JOINERS' WOOD, White Sea: First yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. by 7 in. and 3 in. by 9 in., Second yellow deals, 3 in. by 11 in., 3 in. by 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Third yellow deals, 3 in. by 11 in. and 9 in., Battens, 2 1/2 in. and 3 in. by 7 in., Petersburg: first yellow deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens.

PRICES CURRENT (Continued).

Table with 2 columns: Material Name and Price. Includes items like WOOD, Petersburg: Second yellow deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens, Third yellow deals, 3 in. by 11 in., Do. 3 in. by 9 in., Battens, White Sea and Petersburg: First white deals, 3 in. by 11 in., 3 in. by 9 in., Battens, Second white deals 3 in. by 11 in., 3 in. by 9 in., Battens, Pitch pine: deals, Under 2 in. thick extra, Yellow Pine: First, regular sizes, Broad (12 in. and up), Oddments, Seconds, regular sizes, Yellow Pine Oddments, Kauri Pine: Planks, per ft. cube, Danzig and Stettin Oak Logs: Large, per ft. cube, Small, Wainscot Oak Logs, per ft. cube, Dry Wainscot Oak, per ft. sup. as inch, 3 in. do., Dry Mahogany: Honduras, Tabasco, per ft. sup. as inch, Selected, figured, per ft. sup. as inch, Dry Walnut, American, per ft. sup. as inch, Teak, per load, American Whitewood Planks, Per ft. cube, JOISTS, GIRDERS, &c., In London, or delivered to Railway Vans, per ton, Rolled Steel Joists, ordinary sections, Compound Girders, Angles, Tees and Channels, ordinary sections, Flitch Plates, Cast Iron Columns and Stanchions, including ordinary patterns, METALS, Iron: Common Bars, Staffordshire Crown Bars, good merchant quality, Staffordshire "Marked Bars", Mild Steel Bars, Hoop Iron, basis price, galvanized, (* And upwards, according to size and gauge), Sheet Iron, Black: Ordinary sizes to 20 g., 20 g. and 24 g., 24 g. and 26 g., 26 g. and 28 g., 28 g. and 30 g., Sbeet Iron, Galvanised, flat, ordinary quality, Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g., 20 g. and 24 g., 24 g. and 26 g., Galvanised Corrugated Sheets, Ordinary sizes, 6 ft. to 8 ft. 20 g., 8 ft. 20 g. and 24 g., 24 g. and 26 g., Best Soft Steel Sheets, 6 ft. by 2 ft. and thicker, Thin, Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.), LEAD—Sheet, English, 3 lbs. & up, Pipe in coils, Soil Pipe, ZINC—Sheet: Vicille Montagne, Silesian, COPPER: Strong Sheet, Thin, Copper nails, BRASS: Strong Sheet, TIN—English Ingots, SOLDER—Plumbers', Biennet's, Biowipe, ENGLISH SHEET GLASS IN CRATES, 15 oz. thirds, 2 1/2 d. per ft. delivered, 21 oz. thirds, 2 1/2 d. per ft. delivered, 18 oz. thirds, 3d. per ft. delivered, 20 oz. thirds, 3d. per ft. delivered, 22 oz. thirds, 3d. per ft. delivered, 24 oz. thirds, 3d. per ft. delivered, 26 oz. thirds, 3d. per ft. delivered, 28 oz. thirds, 3d. per ft. delivered, 30 oz. thirds, 3d. per ft. delivered, 32 oz. thirds, 3d. per ft. delivered, 34 oz. thirds, 3d. per ft. delivered, 36 oz. thirds, 3d. per ft. delivered, 38 oz. thirds, 3d. per ft. delivered, 40 oz. thirds, 3d. per ft. delivered, Hartley's Rolled Plate, 3d. per ft. delivered, 3d. per ft. delivered, 3d. per ft. delivered, 3d. per ft. delivered.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Table with 4 columns: Nature of Work, By whom Advertised, Premiums, Designs to be delivered. Includes entry for Water supply and Sewerage, Donaghadee.

CONTRACTS.

Large table with 4 columns: Nature of Work or Materials, By whom Required, Forms of Tender, &c., supplied by, Tenders to be delivered. Lists numerous construction projects across various locations like Portsmouth, Halifax, and London.

[See also next page.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Application to be in. Includes roles like Draughtsman, Clerk of Works, District Superintendent, etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, pp. iv, vi, viii, x, & xix. Public Appointments, pp. xvi, xvii, & xix.

PRICES CURRENT (Continued).

Table of prices for Oils, Varnishes, and other materials. Columns include item name, unit, and price.

TO CORRESPONDENTS.

W. P.—T.A. C. (Below our limit.) M. & F. (Amounts should have been stated.) NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

TENDERS.

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

ASHTON-UNDER-LYNE.—For the execution of street works, Queen-street, &c., for the Hurst Urban District Council. Mr. Samuel Sluit, Surveyor to Council, Council Offices, Kings-street, Hurst. Isaac Powell £4,778 0 0 | J. & J. Woodhead, Ashton-under-Lyne..... £4,521 10 8

BECKENHAM.—For repairs at the George Inn. Messrs. Chart, Son, & Reading, architects, Croydon.— Smith & Sons..... £162 | Goulder*..... £141

BRIGHTON.—For alterations and additions at No. 60, Queen's-road, for Mr. A. G. Sharman. Mr. W. C. F. Gillam, architect, Brighton.— Saunders Bros..... £697 | G. R. Lockyer..... £639 | Titcombe & Son..... 657 | Brown & Son..... 560 | S. H. Diplock..... 645 | H. J. Penfold*..... 547

BRIGHTON.—For alterations and additions at No. 3, 4, & 5, Bond-street, for Mr. A. G. Sharman. Mr. W. C. F. Gillam, architect, Brighton.— Brown & Son..... £796 0 0 | W. & T. Garrett £724 0 0 | H. I. Penfold..... 737 0 0 | G. R. Lockyer..... 692 0 0 | Titcombe & Son..... 735 0 0 | J. Barnes..... 677 0 0 | S. H. Diplock..... 729 0 0 | Saunders Bros.*..... 575 10 0

CARDIFF.—For the erection of an electric tram depot, Pendryis-street, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Town Hall, Cardiff.— W. H. Ingleson £3,238 11 0 | Knox & Wells £7,220 0 0 | A. J. Howell..... 8,150 0 0 | Melhuish Bros. £7,179 0 0 | G. Couzens & Sons..... 7,693 8 10 | Sons..... 7,032 19 2 | G. Griffith..... 7,689 19 4 | C. D. Dunn..... 7,024 8 8 | J. H. Venning..... 7,671 8 0 | J. S. Chubb & Co..... 6,984 0 0 | Jas. Allen..... 7,661 16 11 | W. T. Morgan..... 6,930 0 0 | S. Shepton & Sons..... 7,484 17 0 | E. R. Evans & Bros..... 6,927 0 0 | F. Couzens..... 7,481 8 5 | Sons..... 6,927 0 0 | W. E. Willis..... 7,277 17 3 | Price Bros..... 6,870 0 0 | W. Symonds & D. Thomas..... 7,260 5 6 | J. Thomas..... 6,869 0 0 | D. Thomas..... 7,260 5 6 | D. W. Davies, Cardiff..... 6,774 0 0 | Son..... 7,222 0 0

CHEAM.—For supplying and fitting up boilers and heating apparatus to the wards and for fitting up the disinfecting station and two steam laundries at the Small-pox Hospital at North Cheam, for the Croydon and Wimbledon Joint Board. Messrs. Chart, Son, & Reading, architects, Croydon.— Fraser & Co. Commercial-road East..... £2,566 [Five others tendered.]

CROYDON.—For the erection of a shop at Boston-road. Messrs. Chart, Son, & Reading, architects, Croydon.— Goulder..... £6,020 0 0 | Smith & Sons..... £689 0 0 | Walker..... 719 0 0 | Bacon*..... 659 10 0 | Worsfold & Sons..... 716 0 0

CROYDON.—For alterations at the Croham Arms Inn. Messrs. Chart, Son, & Reading, architects, Croydon.— Smith & Sons..... £189 0 0 | Bacon..... £123 0 0 | Truett & Steel..... 160 0 0 | Tomkins..... 110 10 0 | Goulder..... 130 0 0

CROYDON.—For repairs at the Royal Oak inn. Messrs. Chart, Son, & Reading, architects, Croydon.— Truett & Steel..... £153 0 0 | Goulder..... £137 0 0 | Smith & Sons..... 145 0 0 | Bacon*..... 117 2 6

FARNBOROUGH.—For fitting up the bar of the Queen's Head Inn, Green-street Green. Messrs. Chart, Son, & Reading, architects, Croydon.— Cohen & Co..... £219 | Knight..... £212 | Vanders & Son..... 224 | Simpson & Son..... 149 | Matthews..... 214

GLOUCESTER.—For alterations and additions to Barton Hall and the erection of two new shops in connection therewith, for Mr. William Sandoe. Mr. Harry A. Dancy, architect, Gloucester.— Godwin & Brasington..... £497 10 0 | Gurney & Sons, M. Byard..... 492 17 6 | Gloucester*..... 473 13 10 | J. Simmonds..... 487 10 0

HANWELL.—For the erection of schools for 1,230 children, board's offices, and caretaker's house at Springfield-road, Hanwell. Mr. William Pywell, architect. Quantities by Mr. Max Clarke.— Leslie & Co..... £28,129 | W. Wisdom..... £23,500 | J. S. Kimberley..... 25,647 | W. Blackburn..... 23,068 | J. Appleby..... 25,500 | Johnson & Son..... 23,000 | R. Tenge..... 25,238 | Coulson & Lofts..... 22,770 | C. G. Hill..... 24,103 | Messon & Sons..... 22,327 | A. & B. Hanson..... 24,045 | Hunt & Son..... 21,991 | Stephens, Bastow & Co..... 23,949 | Oxford..... 21,457

HERTFORD.—For the execution of road works, Queen's-road, &c., for the Corporation. Mr. J. H. Jevons, C.E., Borough Surveyor, Hertford.— Griffiths & Co., J. Smart..... £2,130 Limited..... £2,512 | G. F. Tomlinson..... 2,052 | Wallan & Inns..... 2,396 | Free & Sons..... 1,952 | Jos. Jackson..... 2,242 | A. T. Catley, Lond. S. Saunders..... 2,209 | don*..... 1,797 | Laurance & Thacker..... 2,143

KESWICK.—For the erection of a new police station and court-house at Keswick for the County of Cumberland Property Committee. Mr. Geo. Dale Oliver, architect, Carlisle.— Excavating, Masonry, and Brickwork. Isaac Hodgson, Stranger-street, Keswick*..... £1,344 0 0

Excavating, Masonry, and Brickwork. Isaac Hodgson, Stranger-street, Keswick*..... 130 0 0 Slatings. Isaac Hodgson, Stranger-street, Keswick*..... 493 0 0 Carpentry and Joinery. Milburn & Son, Borrowdale-road, Keswick*..... 388 17 5 Plumbing, Plastering, Painting, and Glazing. Joseph Dixon, Penrith*..... 75 0 0 Ironwork. Raybould & Co., Ltd., Marshside, Workington*..... 75 0 0

LONDON.—For making up footway, &c., Dawes-road (Section No. 1), for the Fulham Borough Council. Mr. Chas. Botterill, Surveyor, Town Hall, Waltham Green, S.W.— J. Mears..... £231 | Nowell & Co..... £234 | S.W. 244 | G. Wimpey..... 244

LONDON.—For erection of offices at North Woolwich, for Messrs. Moore & Nettelfield. Mr. Thomas Dinwiddie, architect.— W. Mills..... £1,159 0 0 | R. Soper..... £98 10 0 | T. D. Leng..... 1,077 0 0 | W. Harris..... 927 0 0

LONDON.—For the erection of new staircases, and various alterations at Morton's Theatre, Greenwich, for Mr. Arthur Carlton, and co-directors. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.— Lole & Lightfoot..... £1,963 | H. Groves..... £1,779 | W. Mills..... 1,798 | T. D. Leng*..... 1,670

MERTON.—For fencing, &c., at the Royal Six Bells, High-street, Collier's Wood. Messrs. Chart, Son, & Reading, architects, Union Bank Chambers, Croydon.— Haydon..... £136 | Goulder*..... £110

MINEHEAD (Somerset).—For the erection of market buildings, The Parade, for the Urban District Council. Mr. W. J. Family, architect, Minehead.— J. Steer..... £2,860 0 0 | Passmore & C. Bryer, Jr., 1,802 6 | Derrick, Minehead & Son..... 1,620 0 | head*..... £1,612 10 | J. Burgess..... 1,614 0

MITCHAM.—For erecting a pair of labourers' cottages, Tanworth-lane, Mitcham. Messrs. Chart, Son, & Reading, architects, Union Bank Chambers, Croydon.— Bacon..... £321 | Haydon, Mitcham*..... £440 | Smith & Sons..... 485

MITCHAM.—For the erection of a cottage at Western-road, Mitcham (to complete block of four), for Mr. K. A. Smale. Messrs. Chart, Son, & Reading, architects, Croydon.— Bacon, Thornton Heath*..... £242

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[See also next page

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MOUNTAIN ASH (Wales).—For the erection of a chapel, for the English Baptist Trustees. Mr. T. W. Millar, architect, Mountain Ash:— Jenkins & Sons £3,475 0 0 | D. Harris, Mountain Ash* .. £3,200 0 0 J. L. James .. 3,183 0 0 [Architect's estimate, £3,341.]

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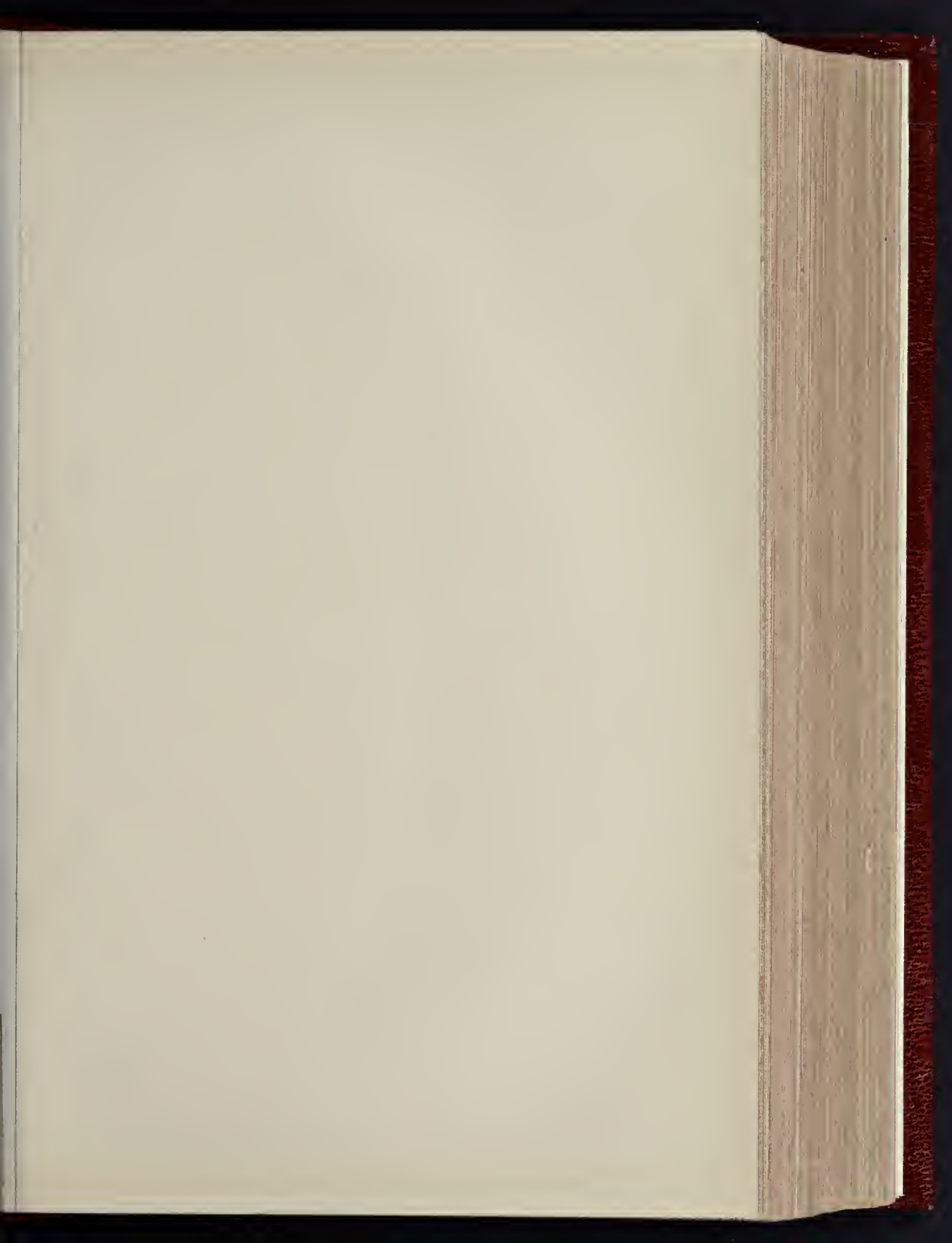
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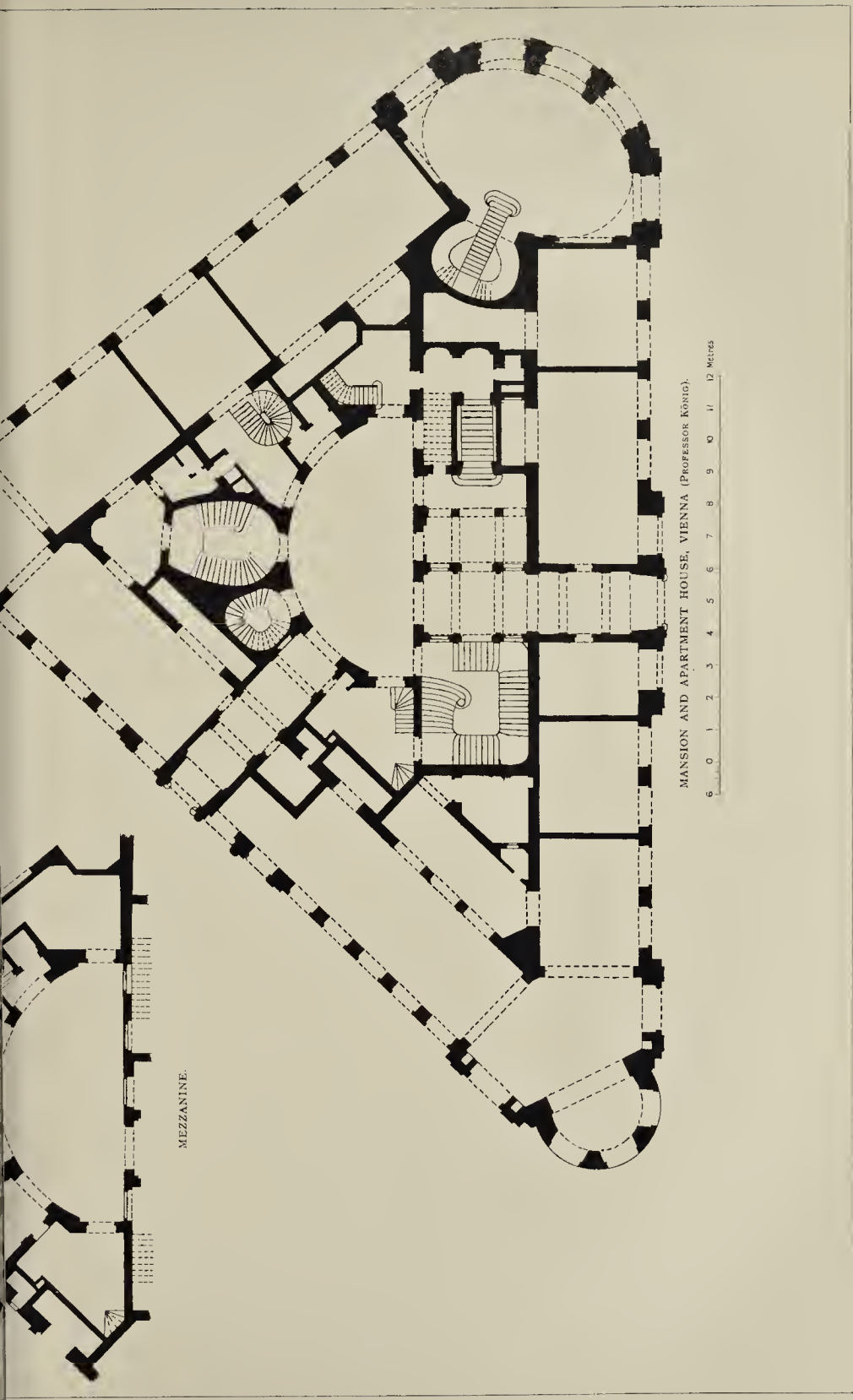
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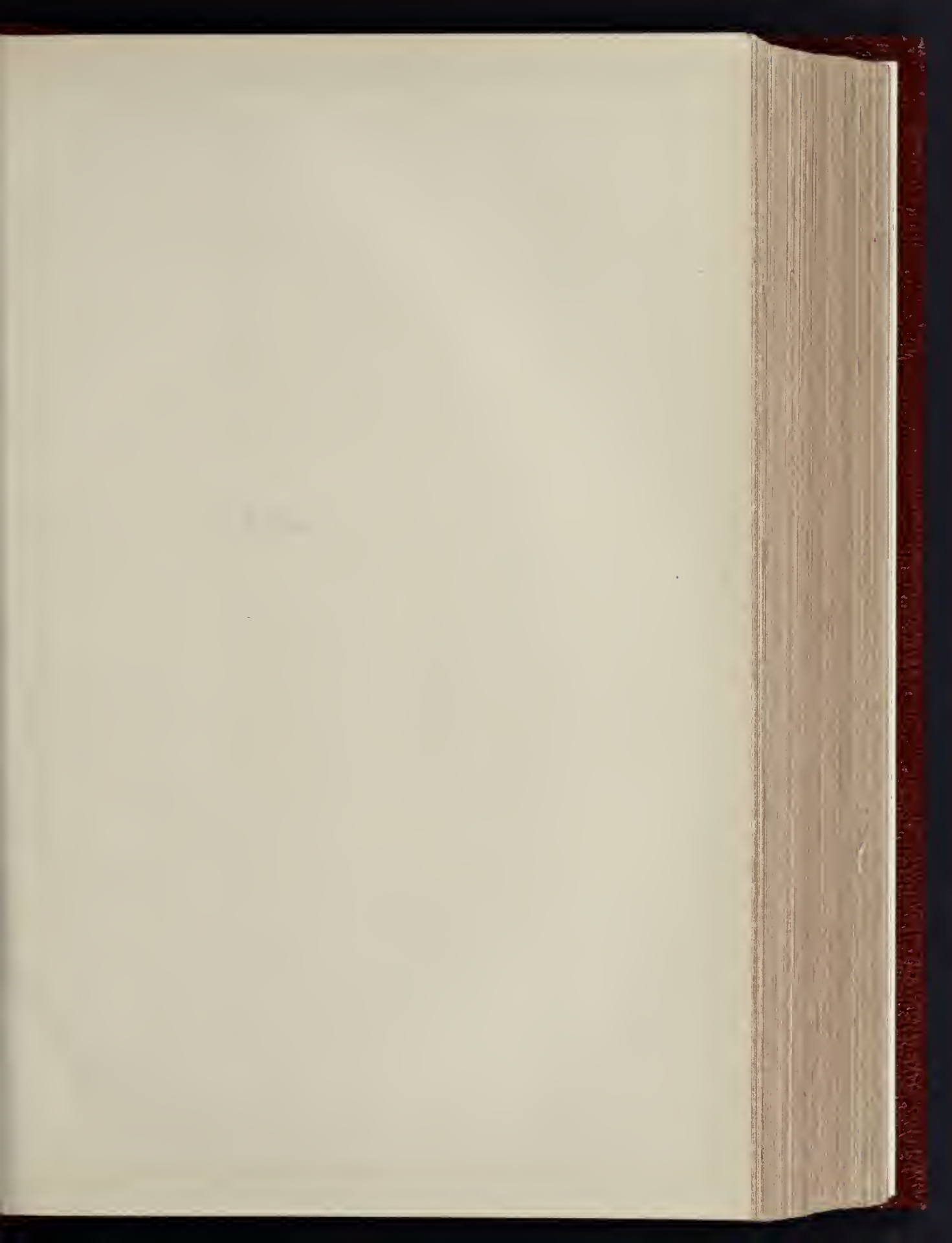
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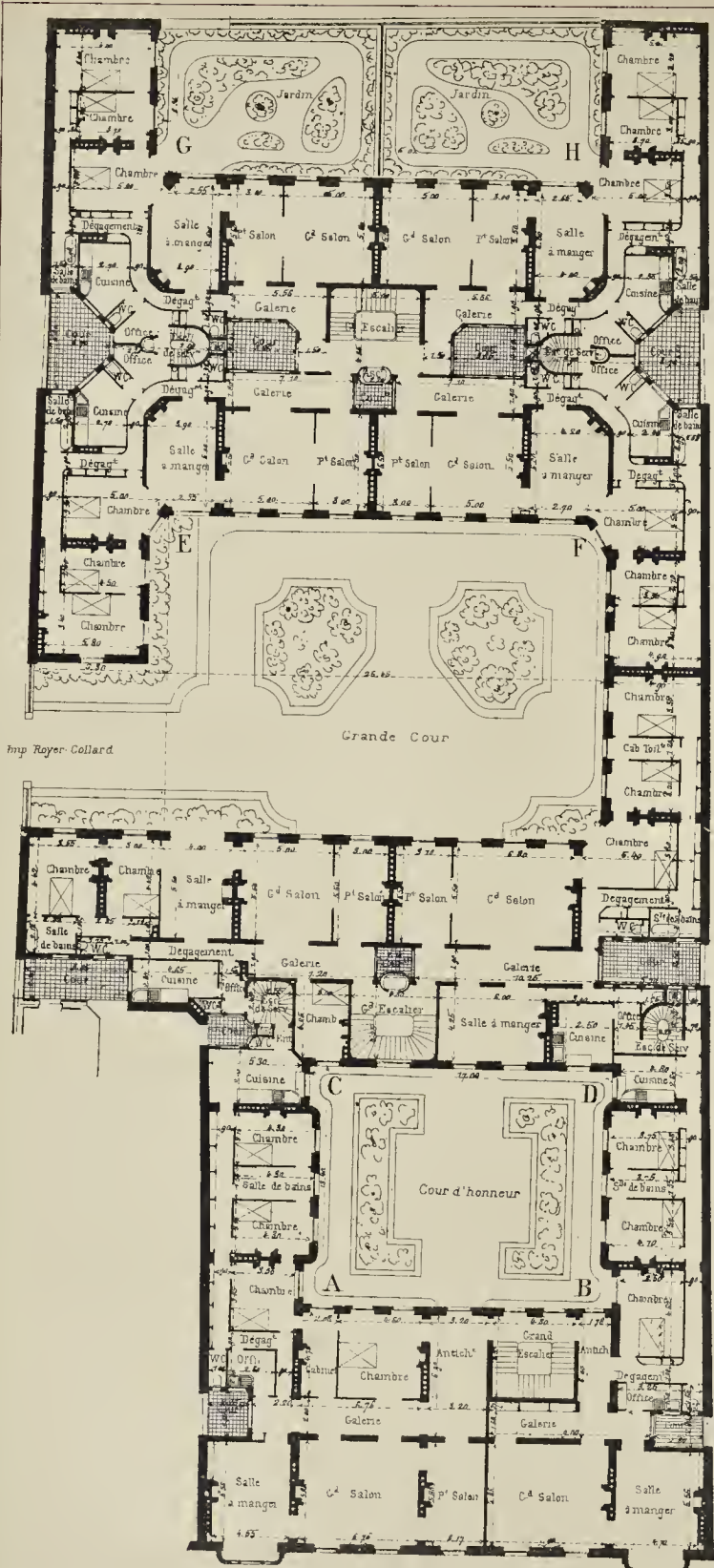
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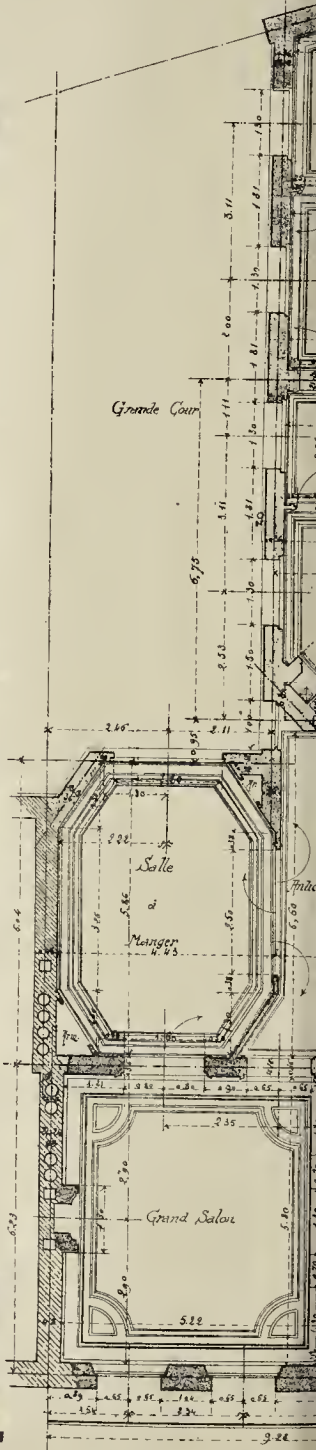
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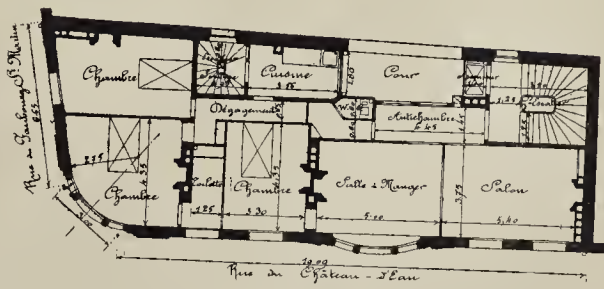
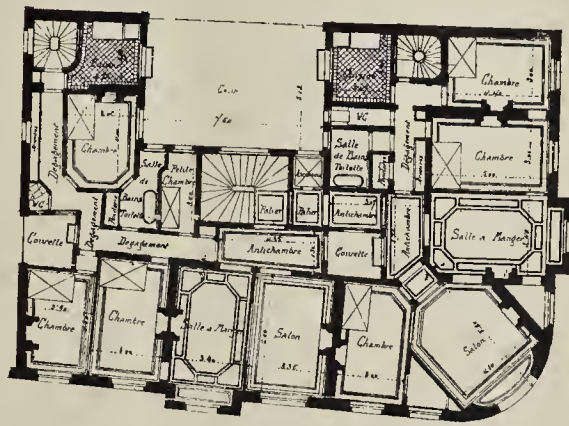
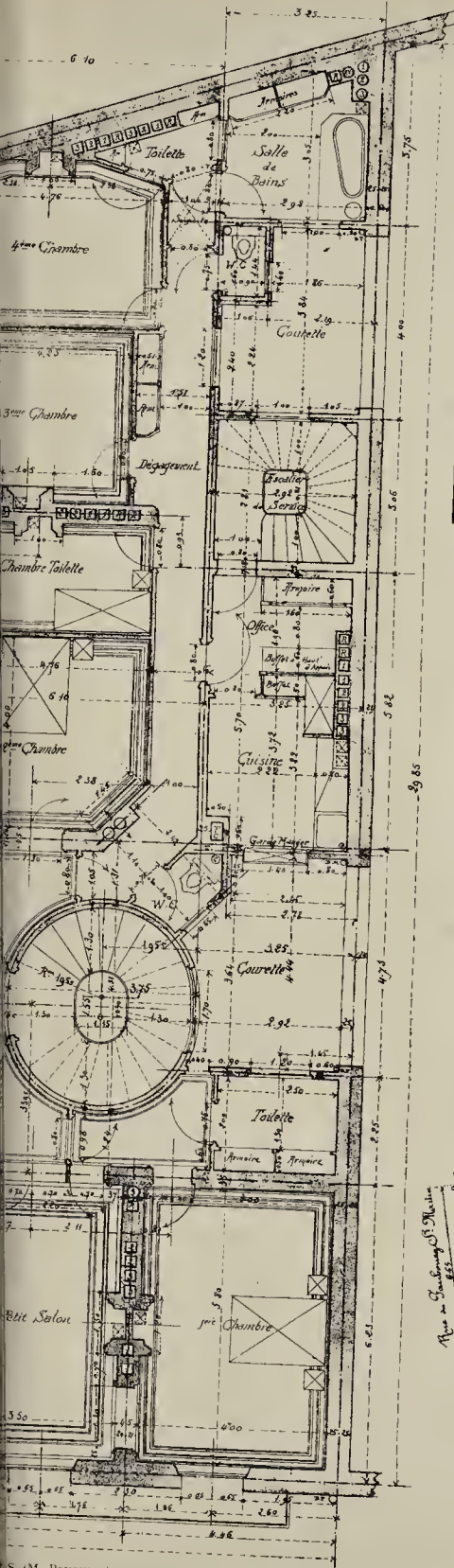


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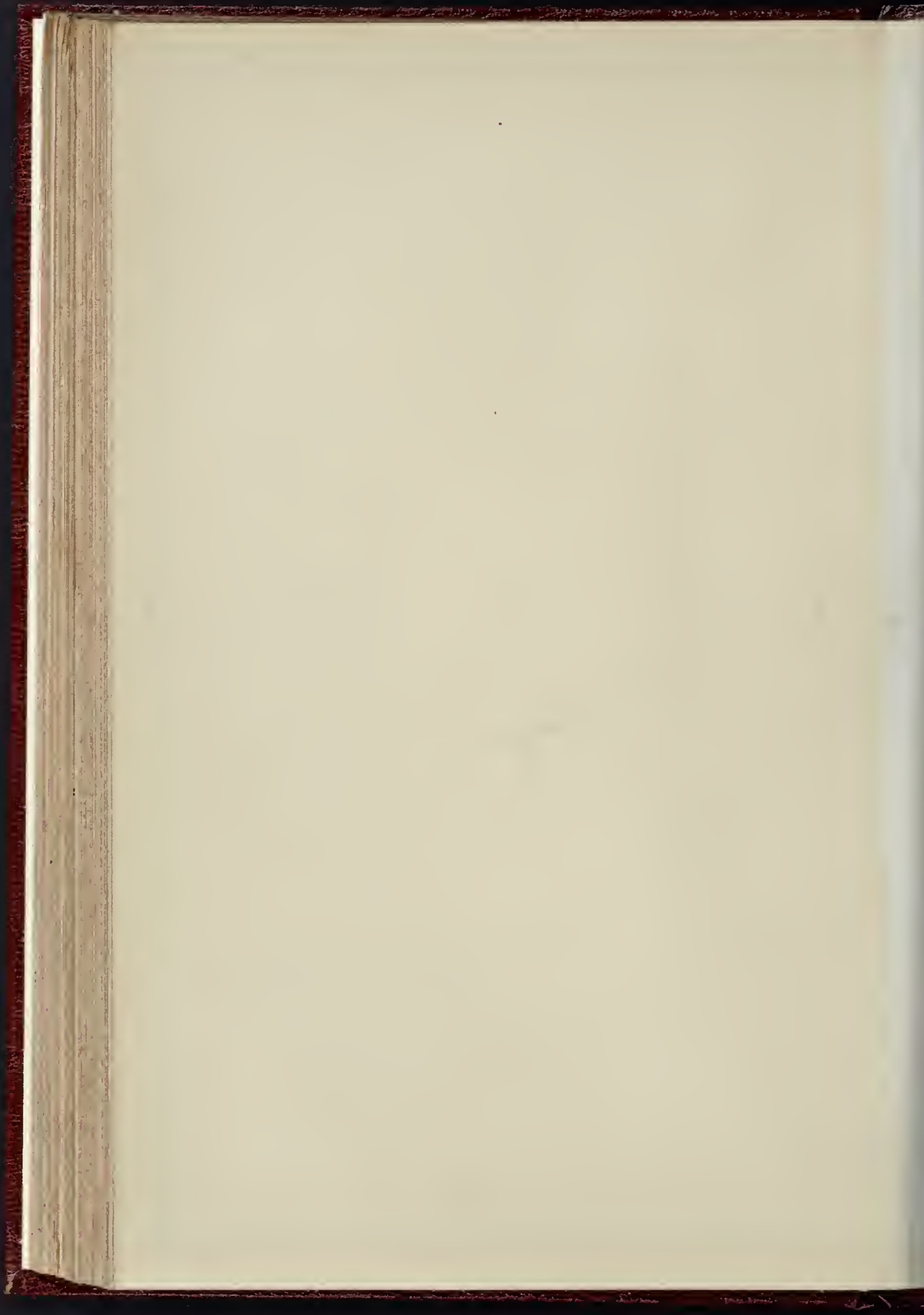


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S (M. POUPINEL).

HOUSES.



The Builder.

VOL. LXXX.—No. 326.

FEBRUARY 2, 1901.

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Plans.....	Double-Page Photo-Litho.
Interior View of St. Peter's (In Illustration of Professor Aitchison's Royal Academy Lectures).....	Double-Page Ink-Photo.

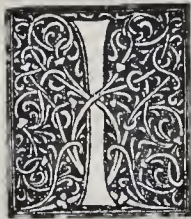
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Building Stones in the Natural History Museum, Vienna.



we exclude the magnificent collection of stones for building and decoration exhibited in the National Museum at Washington, there is no better public collection of these materials in the world than is to be found in the Naturhistorischen Hofmuseums, on one side of the Maria-Theresia-platz, in Vienna. The American collection has been well described by its curator, Mr. G. P. Merrill; but when we saw it, a few years ago, it was very indifferently housed, and the materials were regarded more from a geological than an architectural standpoint. The same cannot be said of the collection in Vienna; it is located, together with other collections, in a magnificent building erected a few years ago in the Italian Renaissance style, chiefly from designs by Semper; the use of various decorative stones is well exemplified in the interior, the walls of the vestibule, grand staircase, doorways, &c., being built or lined with them; whilst the systematic collection of stone samples is well displayed—and the finishing touches have recently been given to their arrangement and classification. Professor Felix Karrer has accomplished the chief part of the work, so far as the museum collection is concerned, and his aim has been to present the different materials in such a manner that the samples may prove useful to architects, engineers, and surveyors, rather than to the systematic lithologist or mineralogist. The interests of these latter are well cared for in the general petrological collection, kept apart from the building stone collections—and this is as it should be, for whilst the petrologist is mainly concerned with stones in their genetic relationships, and from a purely scientific standpoint, no matter whether

they are used for practical purposes or not, the architect, engineer, or surveyor is mainly interested in them as materials of construction.

This collection in Vienna should serve as a model for all others of a similar description. We should like to see the authorities at our Jermyn-street Museum—which purports to be a museum of practical geology—do something on the same lines. Professor Karrer has not been contented to merely label each specimen of stone with its scientific name and locality, but he has written a book on the collection in which are numerous reproductions of photographs of public buildings, together with some account of the building and decorative stones employed in their construction. The museum specimens are thus closely identified with their practical uses.

The collection is not confined to the stones used in Austria-Hungary, though they are, naturally, chiefly represented. The following is a general summary and the method of classification adopted. The whole of the materials are primarily divided geographically; Austria is subdivided for the purpose of the employment (not the origin) of the various materials into the following regions:—Lower Austria, including Vienna; Upper Austria, Linz; Salzburg and its environs; Tyrol, Innsbruck; Vorarlberg, Bregenz; Styria, Gratz; Carinthia, Klagenfurt and Villach; Carniola, Laibach; Görz and Gradisca, Görz; Trieste and neighbourhood; Istria, Parenzo and Rovigno; Dalmatia, Zara; Bohemia, Prague; Moravia, Brünn; Silesia, Troppau; Galicia, Lemberg and Cracow; and Bukowina, Czernowitz. Hungary is divided into three regions:—Hungary proper, including Buda-Pesth; Siebenbürgen, Hermannstadt and Klausenburg; and Croatia, Agram. Foreign localities are represented as follows:—Germany, Italy, France, Belgium, England, Norway, Russia, Switzerland, Spain and Portugal, Greece, United States, Asia, and Africa.

As far as possible, these various regions are further subdivided according to the material

Thus, the materials of construction used in Lower Austria are divided into:—(1) Road and street stones; (2) paving stones; (3) raw materials for bricks and tiles; (4) sands for mortar; (5) raw materials for lime; (6) cement; (7) building stones; (8) stones for decoration; (9) slates; (10) artificial stones, &c., including fire-stone, asphalt, and terracotta; and (11) various materials, such as gypsum, ochre, and talc-schist.

The foreign building stones are not as well represented in the collection as they might be; those from Great Britain are very few, and are not at all characteristic. The German collection is as good as any, but the antique Italian (Roman) marbles and cements are well represented. The curators had, of course, to be contented with what they could get, but they do not seem to have gone to work in such a painstaking manner as have the authorities of the National Museum at Washington in reference to the collection of foreign materials. Thus, the Viennese are invited to regard the alluvial sand of the Seine as a characteristic French mortar sand, that being the only specimen exhibited from France; again, the Eocene plastic clay of Vanvers (called "argille (*sic*) plastique") does duty for French clays suitable for making bricks and tiles. When we look at the fine collection of freestones and stones used for decoration in France, however, it is not difficult to see that much more attention has been bestowed on the collection of these. Russia is very badly represented in the collection, and what few decorative stones are exhibited are not at all characteristic. Instead of a number of the largely used granites from Finland (which can be very easily obtained), and such excellent stones as the Isaac Cathedral in St. Petersburg, and the church of the Saviour, Moscow are built of, we only find such insignificant minerals as rhodonite, amazon-stone, malachite, jasper, &c., which are only employed in the manufacture of jewellery, bric-a-brac, and the like. Moscow marble is represented, and there is a practically unknown granite from Siberia. These do not

give an idea of Russian building stones at all, and this section of the collection requires strengthening.

Professor Karrer has conceived the happy notion of indicating the uses of various principal building stones exhibited by a number of illustrations of public buildings, as already mentioned. The following are the edifices he has selected, not from their architectural interest necessarily, but as showing the capability of the different materials, and as giving an all-round idea of some of the most important European stones for building and decoration.

It is natural that Vienna claims most attention, and the buildings selected for illustration in that city are:—

1. *St. Stephen's Cathedral*.—The oldest part of the building, up to the fifteenth century, is erected of Miocene calcareous sandstone from Zogelsdorf and Eggenburg; since then the remainder of the edifice and various works of restoration have been completed of Miocene limestone from Breitenbrunn, Eisenstadt, and neighbourhood. The earliest portions of the present building were erected in 1258-1276 on the site of a church destroyed by fire.

2. *The Votive Church* in Maximilian's Platz, erected in the Gothic style from designs by Ferstel in 1856-79, is one of the finest churches in Vienna. It is mainly built of Miocene limestone from Wöllersdorf, Mühlendorf, and Brunn, and another kind of limestone from Grisignana. The columns, chancel, and balustrades in the interior are of onyx marble from Egypt.

3. *Houses of Parliament* (Reichsraths-Gebäude), an imposing edifice in the Greek style by Hansen. The lower portions of the building are of granite from Neuhaus and Grasstein; the stairs and balcony of limestone from Repentabor and St. Croce; and the upper portions chiefly limestone from St. Croce and Cava Romana.

4. *Town Hall*, built in 1873-83 by Schmidt, in the Gothic style, principally of Miocene limestone from Wöllersdorf, Margarethen, Mannersdorf, and other limestone from Austria, Trient, &c.

5. *The Natural History Museum* has already been alluded to, and we need only add that the lower part up to the first floor is of calcareous sandstone from Zogelsdorf, whilst the remainder of the exterior is of similar material from Mannersdorf, Mokritz, Vicica, &c., and other limestone from Medolina and Merlera.

6. *The Maria Theresia Monument*, opposite the Burgthor, designed by Zumbusch, the pedestal by Hasenauer, was erected in 1888. It is chiefly of bronze, but the steps are of granite from Mauthausen, the plinth of granite from Petersburg, in Bohemia, and the columns of serpentine from Wissen, near Steyng.

7. *The University*, situated on the Franzens-Ring, a large quadrangular structure in the early Tuscan Renaissance style, was built by Ferstel in 1873-84. The upper parts of the building are of Grisignana limestone, the plinth of Miocene limestone from Wöllersdorf, and the entrance and steps of crystalline limestone from Grasthal.

8. *The Hofburg Theatre*, opposite the Town Hall on the east side of the Ring Strasse, is in the later Renaissance style, built from designs by Semper & Hasenauer in 1876-89. Practically the whole is of limestone from Pomer, Marzano, and Merlera, in

Istria, but columns in connexion with the window decoration are of limestone breccia from Seravezza, near Carrara, in Italy.

9. *The Imperial Opera House*, a grand Renaissance building, was erected in 1861-69 from designs by Van der Nüll and Siccardi-burg. The higher portions of the façade and the plinth are of Miocene limestone from Wöllersdorf and Brunn; the columns and plinth of the lower parts of the building flanking the façade are chiefly of limestone from Aviano and Kelheimerstein, in Bavaria.

From the above it will be noticed that Vienna architects have considerable preference for limestones, at any rate for large buildings. These are principally light in tone, and many of them withstand the action of the weather remarkably well. Their general appearance, as used during the last half-century, is not unlike the *calcaire grossier* so largely employed in Paris. It will also be observed that many of these limestones are quarried considerable distances from Vienna, and that immense trouble has been taken to secure suitable materials, whereby the beauty of the Austrian capital has been greatly enhanced. The calcareous sandstone employed in recent years seems to be of better quality than that kind of stone generally is. Granite is but sparingly used for large buildings in Vienna. It was only natural, however, that it should find its way into such a massive Classical structure as the Houses of Parliament, where it blends perfectly well with the lighter limestones of which the upper portions of the edifice are chiefly constructed. We are unable to mention specifically the numerous stones used for decorating interiors, though Professor Karrer is careful to indicate most of the important ones and parts of prominent buildings where they may be seen, apart from the museum specimens. The foreign marbles chiefly employed are the same as we have seen in London, Berlin, Madrid, Paris, St. Petersburg, and Brussels; the native marbles have, naturally, claimed a great deal of attention, though we cannot say, looking at them as a whole, that they are conspicuous for their beauty.

Turning to the building stones used in Upper Austria, the following edifices are selected for illustration:—

10. The new *Cathedral, Linz*, commenced in 1862 from the designs of the late V. Statz, of Cologne. The freestone is Vienna sandstone from Mais, near Altlenzbach; the plinth and columns are Neuhaus granite.

11. The new *Museum, Linz* (known also as the Francisco-Carolinum Museum), was built in the late Renaissance style in 1895, from designs by Bruno Schmitz, of Düsseldorf. This is a brick building with stone dressings. Around the second floor, in front and on the east and west sides, runs a frieze 8 ft. in height, designed by the late Professor zur Strassen, of Leipsic, and executed by R. Cöllen, portraying the progress of culture in Upper Austria from the earliest times down to its occupation by the House of Hapsburg. The frieze is made of white Tertiary sandstone from Stotzing and Goys, and the steps of limestone from Santa Croce.

Buildings illustrating the use of stone in the Salzburg district are:—

12. *The Stigmundsthor, Salzburg*, hewn out of the Tertiary conglomerate of the Mönchsberg, which is a common building stone in that part of Austria.

13. *The Cathedral and Fountain, Salzburg*, situated in the Residenz Platz. The cathedral was erected in 1614-28 by Santino Solari in the late Renaissance style, principally of the Tertiary conglomerate of the neighbourhood and limestone from the Untersberg; whilst the fountain, also of the last-mentioned stone, was executed in 1664-80 by Antonio Dario.

The two buildings selected for the Tyrol are:—

14. *The Triumphal Arch, Innsbruck*, erected in 1765, of Quaternary breccia from Hötting.

15. *The Parish Church, Bozen*, a Gothic building of the fourteenth and fifteenth centuries, constructed of sandstone and porphyry.

An illustration from Carinthia is:—

16. *The Dragon Fountain of Klagenfurt*, placed in the principal square of the town in 1590. The dragon is hewn out of a monolith nearly $7\frac{1}{2}$ metres in length, and is of green phyllite from the Kreuzberg, about two miles from the town.

Southern Austria is exemplified by:—

17. The new *Offices of the Austrian Lloyd Steamship Company, Trieste*, a palatial building designed by Ferstel; chiefly made of Istrian limestone; the plinth is of stone from Orsera, the pillars, &c., of Santa Croce limestone.

18. *The Palace of Miramar, near Trieste* constructed of Istrian limestone.

19. *The Piazza dei Signori, Zara, Dalmatia*, of limestone from the neighbouring islands of Curzola and Brazza.

Other buildings in Austria illustrated are:—

20. *Teyn Church, Prague*, commenced in 1360, with additions 1460, is the old church of the Hussites. It is built of limestone from Weissen Berge, Strahou and vicinity, and sandstone and Silurian quartzite. The decorated parts are all of sandstone.

21. "*Powder Tower*" (*Pulverthurm*), Prague, a late Gothic gate tower, erected in 1475-84, and restored in 1883. The older parts are of sandstone from Nehviz, and the newer of the same kind of stone from Horitz.

22. *Town Theatre, Brünn*, the capital of Moravia, built in 1882 from designs by Fellner and Hellmer. The groups of figures are of Tertiary calcareous sandstone from Breitenbrunn; steps and staircases of limestone from Kaisersteinbruch; plinth, columns and attic of sandstone from Wildenschwert and Bräusau; steps in front of the building of sandstone from Skalitz; staircases to the boxes of Istrian limestone.

23. *St. Peter's Church, Cracow*, erected 1597-1619, is constructed chiefly of the Upper Jurassic limestone found in the vicinity of the city.

The building stones of Hungary are well represented in the collection. The constructions selected for illustration are:—

24. *The Suspension Bridge (Kettenbrücke), Budapest*, the masonry of which is chiefly of Tertiary limestone from Soskut, with granite from Mauthausen, in parts.

25. *Royal Academy of Science, Budapest*, is principally of limestone of freshwater origin from Tüttingen and Töck and another limestone from Soskut; the plinth is of granite from Mauthausen, in Upper Austria, and from Meissen, in Saxony.

26. *The Redoute Buildings, Budapest*, erected in 1862-65 in the Romanesque-Moorish style, from designs by Fessel, con-

taining some of the principal ball and concert rooms in the city, is built of Sarmatian limestone from Soskut and red Liassic limestone from Tardos and Piske.

27. The *Opera House, Budapest*, built in 1875-84 in the Italian Renaissance style by Ybl, is of freshwater limestone from Süttő and Uröm and the Soskut limestone.

28. The *Cathedral, Gran*, is a large edifice in the Italian Renaissance style, built of the same limestones as the Budapest Opera House, together with trachyte from the neighbourhood.

From the foregoing it will be observed that some of the most imposing edifices in Budapest are chiefly built of limestone from the neighbourhood of Soskut and Süttő, which are very durable materials of their kind, and are readily worked.

Stones for building and decoration as used in Germany are well represented in the collection, and the museum authorities illustrate them by the following buildings:—

29. *Cathedral, Cologne*, constructed mainly of Cretaceous and Jurassic limestone from Bavaria and France, sandstone from the Trias of Germany, Wealden sandstone from Bückeberg, and trachyte from the Siebengebirge.

30. *Cathedral, Regensburg*, of Jurassic limestone and green Cretaceous sandstone from Bavaria.

31. *Cathedral, Strassburg*, of red sandstone found in the vicinity.

32. Large *Fountain, Nuremberg*; the basin of Wealden sandstone from Oberkirchen, the pyramid of Triassic sandstone from Zeil, Wendelstein, &c.

33. The *Catholic Church, Dresden*, the lower portions of sandstone from Cotta, the upper of similar material from Posta, near Pirna.

34. *Pavilion, Dresden*, of sandstone from Elbthale.

35. *Royal Opera House, Dresden*, of stone from the same locality.

Other foreign buildings illustrated are:—

36. *St. Peter's, Rome*, façade, from the base up to the cupola, of travertine from Fiano in the Sabine mountains; columns of the portico and the statues in connexion, of travertine from San Clemente (*Lapis Tiburtinus*).

37. *Cathedral, Milan*, erected almost entirely of crystalline limestone from Gandoglia, near Mergozzo Lake, and other localities not far away on the Lago Maggiore.

38. *Notre Dame, Paris*, built almost entirely of Tertiary calcaire-grossier of the Paris basin.

39. *Grand Opera House, Paris*—A great part of the principal façade is of Jurassic limestone from Larys; whilst the parterre is of similar limestone from Anstrudes and Ravières. Other parts of the building are also of Jurassic limestone, and of Tertiary calcaire-grossier from several localities. The decorative stones employed come from well-known places in Italy, Sweden, France, &c.

40. *Palace of Justice, Brussels*; principally of massive, crystalline, blue, Carboniferous limestone from Namur, and white Jurassic limestone from France. In a lesser degree (some columns, &c.) of Carboniferous limestone from other localities.

41. *Hotel de Ville, Brussels*; the old portion of the building is of Eocene calcareous sandstone from the vicinity; later work,

restorations, &c., of Eocene limestone from Gobertang.

42. *Hotel de Ville, Schaerbeck*, near Brussels, is of brick and Carboniferous limestone from Namur.

The only adverse criticism we would offer to this list is that some of the buildings selected for illustration are close together, or in the same city, whereby we do not get quite such a good idea of the range of European building stones as might otherwise have been the case. There was no need to have given so many examples from Vienna and Budapest, for instance, if the number of illustrations were to be so limited—though Vienna museum officials might readily be pardoned for so doing. Dresden and Brussels, again, are given three illustrations each. We should have thought it better to have brought together a few examples from Spain, Russia, and England, in lieu of some of these duplicates. However, we will not complain, for, as we have previously stated, the Vienna collection of building stones itself is a remarkable one, and well worth careful study by architects.

NOTES.

A CIRCULAR has been issued by the Council of the Institute of Architects to the effect that the meeting for the presentation of prizes and studentships announced for Monday, February 4, is postponed till Monday, February 25, at eight p.m., "in consequence of the lamented death of her late Most Gracious Majesty Queen Victoria, Patron of the Royal Institute." The Institute will be closed on the day of the Royal Funeral, Saturday, February 2. At the meeting of February 25 an address of condolence to his Majesty will be moved from the chair at eight p.m.

Buildings under the Public Health Act. It is a matter of some regret that the official law report should continue to chronicle cases which do not really lay down any principle of law, but are cases depending on the view taken by the Bench of certain facts. Last week, the Queen's Bench Division (so called by statute) had to decide whether a weighing-machine shed at Southend-on-Sea was a building within the meaning of Section 157 of the Public Health Act, 1875, which empowers urban authorities to make by-laws "with respect . . . to new buildings. . . ." The structure in question appears to have borne a considerable resemblance to a bathing-machine, and the Justices held that it was not a "building." This decision was appealed against, but was upheld. In the course of the argument several cases were referred to as governing the one under discussion—not cases laying down a principle of law, but resembling the present one in their facts. But a very slight difference may be sufficient to cause a judge to consider one structure to be and another not to be a "building," and one result of reporting and preserving such cases is to mislead persons. Each of these cases must be considered on its merits; and, as we have said, a slight dissimilarity, such as movability or unmovability, may cause judicial decisions to vary.

SIR W. RICHMOND, as President of the "Coal Smoke Abatement Society," has addressed a letter to the Secretary of the

London School Board, which has been printed in the *Times*, calling on the School Board to use the influence which its position gives it, as the largest owner of public buildings within the metropolitan area, in promoting and recommending the use of grates which will ensure perfect combustion. Sir W. Richmond considers that the Society which he represents has been very successful in procuring the enforcement of the existing law in regard to the issue of smoke from trade and manufacturing buildings, but admits that it is a greater difficulty to reach the domestic fire. He says:—

"It is in the latter direction that the society ventures to beg your assistance. Many forms of grates and stoves are already in the market which are designed to materially reduce the evil of imperfect combustion, and the society would respectfully suggest that wherever occasion arises your Board would specify for some form of these apparatus being used in its buildings. Such an example set by so influential a body could not fail to have a most salutary effect, and be of the utmost assistance to the society in its work."

I should add that a similar suggestion has been made to her late Majesty's Government, and has been received by them with a promise to put it in operation without delay and whenever possible, and even to furnish facilities for trials in order to ascertain the best form of grate for the purpose."

It is no doubt in the direction of the use of grates calculated to ensure perfect combustion that the true remedy lies—short of abandoning coal fires altogether for gas fires, which we do not think is likely to be done. As we pointed out before, the recommendation of such remedies as the use of anthracite coal alone, which has been suggested, is futile, because there is not enough anthracite available for universal use, even for a time, without sending up its price to a practically prohibitive extent. Much may be done by grates better formed for consumption of fuel than many of those in ordinary use; but it must be remembered that some of these pre-suppose special arrangements for the admission of air, which cannot always be applied in houses already built.

MR. ARTHUR WHITELEGGE, Fencing Machinery. The Chief Inspector of Factories under the Home Office, has issued a special circular in regard to the important subject of the proper fencing of machinery in motion, especially with regard to new machines. He points out that while much progress has been made in applying guards to existing machinery, new machines in other respects improved, are still sent out by the makers without due regard to this essential point; and, moreover, that precautions which are taken as a matter of course in the case of those made for export are often omitted in the construction of similar machinery intended for use in the United Kingdom. "Hence many serious and fatal accidents arise, and at best the fencing which can be carried out later by the purchaser is usually less effective and more costly, even apart from the risks attending delay. And further, it is obviously more easy when designing a machine to provide proper places for guards than to have to fit guards on to a machine designed without any provision being made for them." Among special points in the extracts appended to the circular it is mentioned that the apparently small matter of having set-screws with projecting heads on drill and lathe chucks has produced many accidents, and that many workmen will use projecting set-

screws even after the chucks have been altered and recessed to allow the screw to go flush with the chuck. No doubt carelessness (or sometimes ignorance) on the part of workmen is the cause of many accidents that need not have happened; and in the Walsall district we learn that it is a practice to paint all machine guards a bright red, as a kind of signal that there is danger inside their lines. It is noticed that American machinery is generally sent out by makers much more efficiently guarded than that made by English firms. The subject ought to have the careful attention of all owners or managers of factories worked by machinery.

Girton College, Cambridge.

SUBSCRIPTIONS to the amount of 31,000*l.* are invited towards the extension scheme which is being carried out at Girton College, Cambridge. The entire scheme, which will cost about 55,000*l.*, comprises a new hall and servants' quarters (now ready), kitchens, lecture rooms, rooms for fifty students, a chapel, a swimming bath, and additional rooms for the resident staff, to be erected after the plans and designs of Messrs. Alfred Waterhouse & Son. The old hall will, we gather, be converted for purposes of the library. Mr. Waterhouse's former designs for the College were exhibited at the Royal Academy in 1887, and were noticed in our columns of May 7 of that year. They consist of blocks of houses in red brick with black and white gables, and a gate-tower.

Professor Aitchison's Lecture.

PROFESSOR AITCHISON commenced on Monday his course of lectures at the Royal Academy on the ever-interesting subject of St. Peter's: the lecture is printed on another page of this issue. All the Professor's friends will have been glad to see him apparently in much better health than at his last year's lectures. The lectures are illustrated by a number of drawings and photographs hung on the walls, both of St. Peter's as it exists and of various other preliminary schemes of Bramante and San Gallo, and also by a number of lantern slides. Two of the architectural members of the Academy, Mr. T. G. Jackson and Mr. Belcher, were among the audience.

THE QUEEN'S DEATH.—On account of the death of her Majesty the Queen the ordinary general meeting of the Architectural Association, advertised for February 1, has been postponed to February 8, at 7.30 p.m., when a paper will be read by Mr. D. T. Fyfe on "Cretan Architecture."—The annual dinner of the Sanitary Inspectors' Association, to have taken place on Saturday, February 2, is postponed until February 15, at the Venetian Chamber, Holborn Restaurant, when the Archdeacon of London will preside.—The annual dinner of the Builders' Foremen's Association has been postponed from February 2 to February 9.—It was agreed on the 25th ult., by the Council of the Northern Architectural Association, that the following resolution be sent to Sir Arthur Bigge, Osborne House, Isle of Wight:—

"Sir,—On behalf of this Association we beg that you will be the medium of conveying to his Majesty the King and the Royal Family the deep sympathy of this Association in their great sorrow, and at the same time to express their sincere loyalty to the Throne of these Realms.—We are, Sir, for the Northern Architectural Association, President, Wm. Glover; Hon. Secretary, A. B. Plummer."

The following is the resolution passed at the meeting of the Dublin Local Section of the Institution of Electrical Engineers on the 24th ult., proposed by Mr. Porte and seconded by Mr. Ruddle:—

"That we, the Dublin section of the Institution of Electrical Engineers, desire to record the deep grief with which we have received the news of the death of our late beloved Sovereign, Queen Victoria, and that this meeting do forthwith adjourn as a mark of our sorrow. Also that the Central Institution propose to present a vote of condolence with the Royal Family, it is the desire of this section to heartily endorse the same."

LETTER FROM PARIS.

THE restoration of the dome of the Panthéon has become a matter of urgent necessity. The columns and capitals supporting the dome, the work of Soufflot, commenced in 1764 under Louis XV., are fast falling to pieces and endangering the superstructure. It is estimated that the work of repair will occupy about four years, and an important vote of money for carrying out this work is being urgently asked for.

The celebrated "Machine de Marly," near Versailles, a series of water-wheels constructed by the engineer Sualen on one of the small arms of the Seine at the time of the completion of the Chateau de Versailles, for the purpose of pumping the river water to the reservoirs there and for the supply of the celebrated cascades, is about to undergo a complete transformation. This old and powerful machine had already been modified somewhat under the Restoration, but it was found that the constant rise and fall of the Seine interfered greatly with the proper working of the supply; besides that the increasing contamination of the river water could no longer permit it being employed for drinking purposes at Versailles. The machine has therefore, for some time past, been employed only as power necessary to pump to the higher ground fresh water from the neighbouring springs. It has now been decided to replace the old-fashioned water-wheels, which have for so many years formed an interesting attraction at Marly, by modern turbines; but as it is necessary to avoid stopping the supply of water to Versailles for any time, however short, three of the old wheels will continue to work during the replacing of the other three, which will then allow the replacing of the three still remaining.

The construction of the new church of Saint-Jean on the hill of Montmartre has been stopped for some time by the authorities, owing to doubts as to the solidity of the new building. This church, which is to replace the old church of Montmartre, in which all public service has been stopped, and which has been classed as a "historical monument," is being built from the designs of M. de Baudot, diocesan architect, an old pupil of Viollet-le-Duc, and one of the most fervent advocates of a rational architecture evolved from a complete and rational use of modern materials. The building is being constructed entirely according to the system of armed cement known as the system Cottancin, and is therefore a perfect innovation in church building. The matter of the stoppage and the condemnation of the structure was taken up very strongly by Abbé Sobaux, the vicar of the parish, with the result that it was decided to allow the building to be continued if the trials of solidity proved satisfactory. These trials have just taken place and were found very satisfactory; the floors of the building, of a thickness of not more than 2 in., were found to resist perfectly the trial weight of 125 lbs. per superficial foot. M. de Baudot, whose private house is an interesting example of this system of construction and decoration, had every reason to obtain satisfaction as regards the strength of his new work, as he is himself General Inspector of Diocesan Buildings and has to report on the solidity of the many buildings in his diocese.

The city of Paris has just voted an important sum for the preliminary work of restoring and rearranging the Hotel de Lauzun, a fine old residence of the time of Louis XV., situated on the Quai d'Anjou in the Ile Saint Louis at Paris. This interesting old building, which for some reason had been spared during the troubles of the Revolution, was bought by the town some short time ago from the heirs of the late Baron Pichon, one of the most learned of French book-lovers, with the view of making it the museum of Parisian art of the seventeenth century. The decoration of the interior, which still exists in a marvellous state of preservation, is most sumptuous in style. The museum, when completed, will certainly be one of the most interesting places to visit in Paris.

The buildings at the late Exhibition are now being rapidly demolished, but nothing has yet been absolutely decided as to what will be done with the spaces left vacant. The international buildings on the Rue des Nations along the river bank are disappearing one by one. In a few weeks no traces will be left of the Belgian and German buildings. The English Royal Pavilion has been dismantled

all fittings and contents, and in a few weeks will be a thing of the past. The French official buildings, however, form a matter of more difficulty, for the various demolishing contractors are by no means satisfied with the specifications set out by the administration. It is wonderful how small are the offers obtained from demolishing contractors at present for buildings and materials which cost immense sums for their construction. The Porte Monumentale, designed by M. Binet, has been sold for the sum of 408*l.*, and the contractor for this sum enters into possession of 210 tons of iron, 260 cubic yards of timber, nearly 1,000 cubic yards of building stone, and over 7,000 electric globes. The German Pavilion has, it is said, been sold for 1,000*l.*

The following architects have been elected as members of the Committee of the Société des Artistes Français:—MM. Pascal, Vaudremer, Loviot, Chancel, Rauffin, Normand, Scellier de Gisors, Courtois-Suffit, Formigé, and Boeswillwald, the number of votes obtained at the election being in the above order.

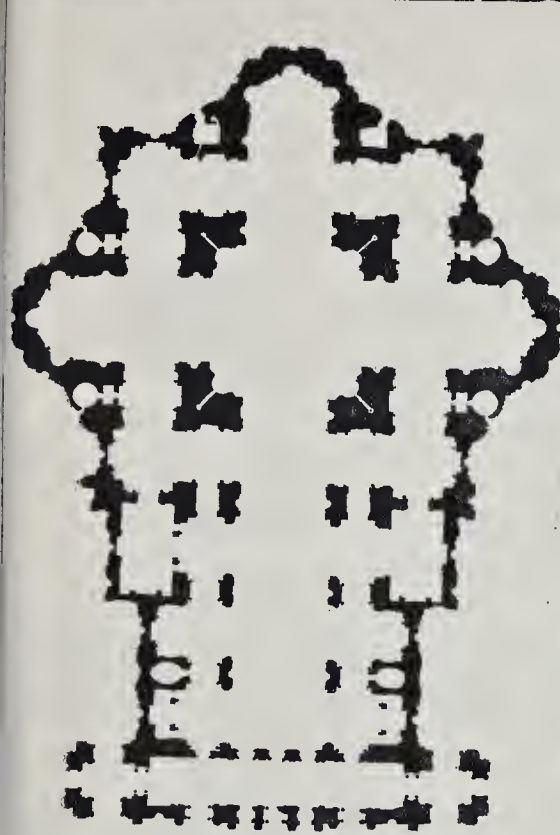
A great discussion is taking place between the town of Paris and the State concerning the demolition of the fortifications of Paris on the west and north of the town, from the Porte d'Autueil to the Porte de Pantin. The operation, which will in all probability soon be put into effect, will result in an immediate loss to the town of somewhat over four million sterling; there will be 500 acres of ground, now occupied by the fortifications, to be purchased from the State at a cost of eight million pounds, the saleable value of the freed ground being estimated at about four million sterling. This will, however, be a great opportunity for private speculation, and some fortunes will probably be made over the future operations.

It is proposed to add to the present National Manufactory des Gobelins, the large old building which was erected in the fifteenth century, and which once sheltered the working artists who gave the name of Gobelins to this style of work. The building, known under the name of Atelier de la Reine Blanche, stands in the middle of a large piece of ground near that of the present manufactory. The addition of the original building to the present manufactory would be most advantageous, as its enlargement is much required; it would also save from destruction a building of historical interest in the arts of France.

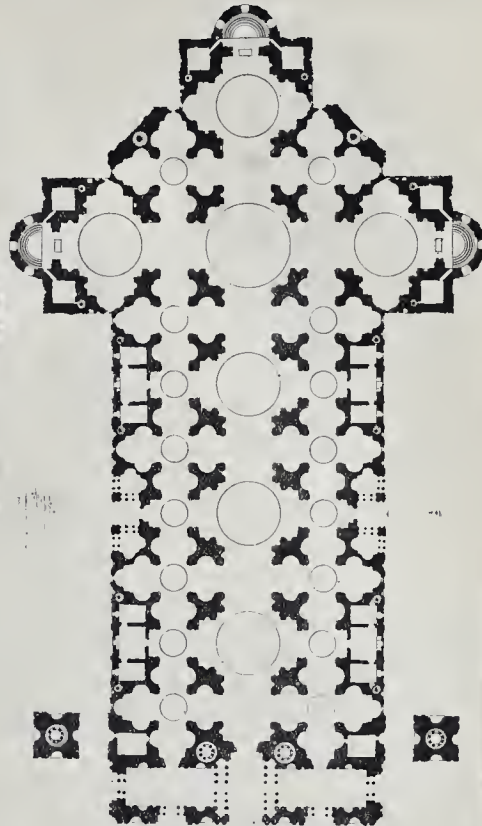
A new and interesting scheme for the utilisation of the ground occupied by the Cirque des Champs Elysées has been brought up by MM. Detaille, Gérôme, Flameng, and Robert Fleury. They propose to construct thereon an elegant pavilion, the design for which would be entrusted to M. Girault, the architect of the Petit Palais of the Champs Elysées, and utilise the new building for the annual Salons of the French artists. At other times this "Palais des Artistes" would be available for concerts and other entertainments.

The Société des Artistes Français (Old Salon), after its internal dissensions during the last few weeks of last year, has at last appointed its Council. In succession to M. Jean P. Laurens, who resigned, they have elected as President M. Bouguereau, who, as far as art is concerned, does not exactly represent modern progress. Of course, it is a question not only of artistic but of administrative capacity, and we do not yet know what may be M. Bouguereau's qualifications in the latter sense. He is the fifth President of the Société, which commenced its career under the able directorship of the venerable M. Bailly; to whom succeeded M. Bonnat, followed by M. Detaille and then by M. F. P. Laurens. A sculptor and an architect, M. Bartholde and M. Scellier de Gisors, have been elected Vice-Presidents. M. Albert Maignan will fill the office of Secrétaire Rapporteur, with the assistance of M. Vibert (painter), M. Georges Lemaire (engraver), M. Pascal (architect), and M. Mongin (etcher). M. Boisseau, the sculptor, will continue in office as treasurer. The architectural sub-committee is composed of M. Adrien Chancel and M. Formigé. In the various separate sections, M. Henner will be president for that of painting, M. Frémiet for sculpture, M. Morot for engraving, M. Alfred Normand for architecture, and M. Gardet for decorative art, for the ensuing Salon.

Whether the new appointments will put an end to differences and dissensions remains to be seen, but it is considered rather doubtful



Plan of St. Peter's (no scale).



Fra Giocondo's Plan for St. Peter's.

and the proposal for a new building for exhibitions on the site of the Cirque des Champs Elysees, already referred to, looks like a threat of a rival exhibition. The Municipal Council has pronounced no definite opinion as yet, but it is understood to be favourable to this scheme partly because it is expected that M. Girault, the proposed architect, will have an opportunity to produce another very beautiful building. There will also be the advantage of having a concert-room for Paris in a central position; an addition very much needed, for that at the Trocadéro is both inconvenient in position and very bad in an acoustic sense.

The Champs Elysees, which would gain a new attraction by the realisation of the above scheme, is in fact much in need of a new laying out, for it has suffered terribly from the exigencies of the great exhibition, for the sake of which many fine old trees have been sacrificed. As soon as the favourite promenade of the Parisians has been restored to its usual condition, the administration will select a site for the erection of the fountain in ceramic ware which the Sèvres manufactory had erected on the Esplanade des Invalides, and which, when surrounded by trees and flower borders, will have a charming effect. It is proposed also that the portico in ceramic ware erected by Sèvres on the Esplanade shall be rebuilt either in the square of St. Germain des Prés or in that of St. Laurent.

M. Guadet, the architect of the Théâtre Français, has placed under the arcades of the Palais Royal, at the entry of Rue Richelieu, four frames of white marble in which will be placed medallion portraits of Racine and Victor Hugo by M. Barrias, and similar portraits of Corneille and Molière by M. Denys Puech. On these four frames will be engraved inscriptions recording the vicissitudes which the Théâtre Français has passed through, having been built in 1782 from the designs of the architect Louis and afterwards four times restored—in 1798 by Moreau, in 1822 by Fontaine, in 1864 by Prosper Chabrol, and in 1890 by M. Guadet.

The "Société des Miniaturistes et Eclaircisseurs" has opened its sixth exhibition in the Georges Petit Gallery. Among the best works may be named those of Mmes. Debillmont, Chardon, Marguerite Delaroché, and Camille Isbert, and those of MM. Guinier, Callias, and Zier. The annual exhibition of the Cercle Volney has also opened its doors. We need say nothing of the amateur artists who, in their quality of members of the club, indulge unfortunately in the right to exhibit a great many bad pictures. But there is a fine portrait of a lady by M. Humbert, a head of a Patrician of the sixteenth century by M. Benjamin Constant, other good works by MM. Cayron, Zeviller, and Albert Laurens, sea-pieces by MM. Gustave Garaud and Gransire, a fine landscape by M. Adrien Demont; and in sculpture, a beautiful figure of Joan of Arc by M. Levasseur, and some fine busts by M. Puech.

The death is announced, at age of 47, of M. Joseph Armand Olive, member of the Société Centrale des Architects of the Caisse de Defense Mutuelle. He was the son of a talented architect, M. Joseph Olive, who died only two years ago at Antibes. After having studied at the Ecole Centrale des Arts et Manufactures, Armand Olive was attached to the Orléans Railway Company, at Rouen. He subsequently studied architecture under his father and under M. Bénard, and since 1880 took part in important works at Paris and in the provinces. He was also professor at the Ecole Professionnelle de la Papeterie and at the Association Philotechnique; and was the author of an able treatise on hydraulics.

PORTMAN CHAPEL, BAKER-STREET.—On January 24, this chapel, which is one of the oldest existing proprietary chapels in London, was consecrated by Bishop Barry, Rector of St. James's, Piccadilly, as St. Paul's Church, Portman-square. The church and its site have been bought for 8,000l. from Lord Portman, who contributes 3,000l. towards the endowment fund, and are now conveyed by the Trustees to the Ecclesiastical Commissioners, who have assigned to the church a district taken out of the parish of St. Mary-lebone

FIRST ROYAL ACADEMY LECTURE ON ST. PETER'S.*

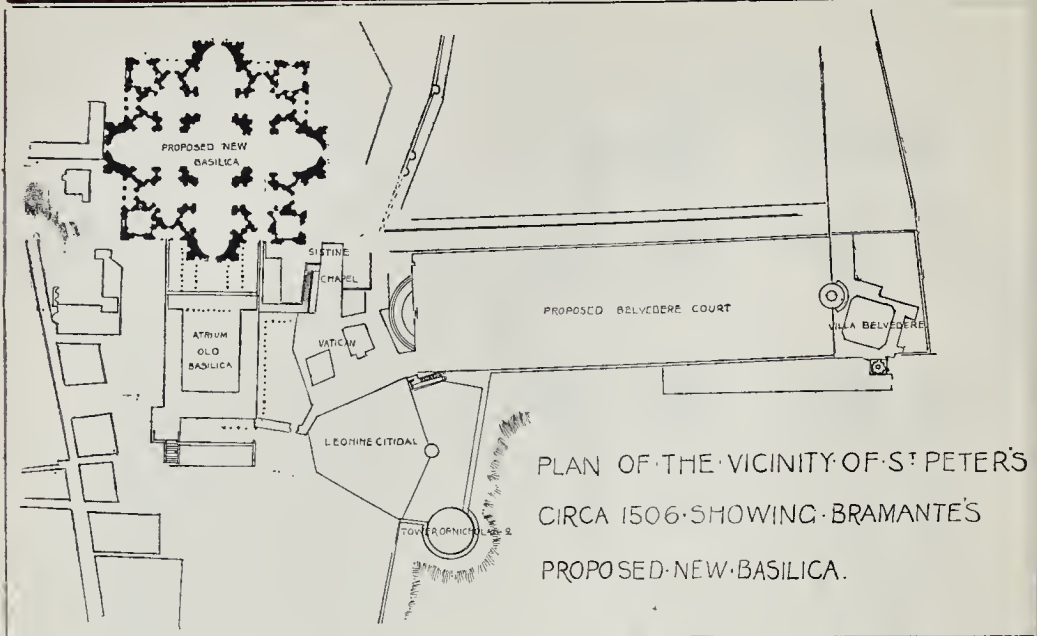
THE name of St. Peter's conjures up visions of the various impulses that were acting on mankind, when its first stone was laid by Julius II. in 1506, impulses that were dispelling the clouds of ignorance, breaking the fetters of habit and authority, and were again impelling mankind to dare to think, to reason, and to act on the results of that reasoning. Directly mankind began to turn their attention to Nature they found that it was only by observing phenomena and reasoning upon them, that discoveries could be made. This new attitude of men's minds was properly called the "Renaissance" or new birth of man's desire to use his intelligence how he liked. In the steamboat, the railway, the telegraph, the electric light and power, in chemistry and photography, we see some of the results.

Peace, comparative freedom and security had brought plenty, and must have had some effect on men's minds in Italy or in Tuscany at least, but the main reason of this new birth was the increased study of the Roman writers and the finding from them that all they knew was learnt from the Greeks, so that the Italians began to study the Greek language, till it was the mark of a neglected education not to be able to speak it—the study of the Roman and Greek literature and of Greek philosophy sometimes in a Roman dress, as the theories of Epicurus in the poem of Lucretius, "On the Nature of Things" ("De Rerum Natura").

So great was the effect of this new birth on men's minds and such hopes did it give them, that a tyrant like Sigismund Pandolfo Malatesta sent to the Morea for the bones of Gemistos Plethon, who had taught the Italians Greek, and after putting them and those of some other distinguished humanists into sarcophagi he enshrined them in his temple to Isotta at Rimini.

The Italians had learnt from their studies that the ancients were free to pursue any

* By Professor Aitchison, R.A.



PLAN OF THE VICINITY OF ST. PETER'S
CIRCA 1506 SHOWING BRAMANTE'S
PROPOSED NEW BASILICA.

studies that they chose without blame or hindrance, and to indulge in all earthly enjoyments. They saw that Alexander the Great had conquered much of the world known to the ancients, and that the Romans had a large part of the earth for their empire, and hoped that by rivalling the Romans in the fine arts they might restore to Italy the power and dominion it had under the Romans, and consequently they were on the tiptoe of expectation of enjoying the fancied elysium of the ancients. When I speak of the Italians, as a rule I mean the Florentines, and those from the cities of the Val d'Arno, who were the most brilliant and versatile of men. The only man I ever knew that can be compared with these men of the Italian Renaissance was our lamented President Lord Leighton.

I think that another of the causes of this sudden uprising of the human intellect was the long-continued discipline and austerity of the Middle Ages. There was at the Renaissance in Italy an ambitious craving to do something that would give each man an undying name in the career he had chosen, and the possession of this passion carried out to its realisation was called *virtù*, i.e., a clear view of what a man wanted and could do, carried out without regard to anything but success. It had nothing to do with "virtue," for Machiavelli constantly applies it to Cesar Borgia. This *virtù* was mostly found in Florence. We must, however, not forget that Luther was a German, Copernicus a Prussian, Descartes a Frenchman, Columbus a Genoese, the Cabots Venetians (though Sebastian Cabot was born at Bristol), Prince Henry the Navigator and Vasco di Gama were Portuguese, and we must see that the severe corporal and mental discipline, the restriction, and the austerities of the Middle Ages, though training mankind to suffer and to think, had begot a hatred of these austerities and restrictions that only wanted an example, which was got from Classic literature for all Europe to try and set itself free; and doubtless the Arab centres of learning and the speculations of the Arab philosophers had not a little aided this desire.

About the middle of the fifteenth century (1452-1498) Vasco di Gama found the way to India by doubling the Cape of Good Hope, and gave Camoens the subject for the "Lusiad," while the search for a new way to India led to the discovery by Columbus of the West Indies, in 1492, and he probably saw from his ships parts of North and South America. Amerigo Vespucci, the Florentine, had the good fortune to give his Christian name to the continent, but whether he or Sebastian Cabot saw it first is hardly settled now, though it is generally maintained that Cabot was the first—but this

was 1497. The revising of the old astronomy of Ptolemy (139 A.D.), known in the Middle Ages as the "Almagest," by Copernicus (1473-1542), Tycho-Brahe (1546-1601), Galileo (1564-1642), Kepler (1571-1630), and Descartes (1596-1650), ended in the discovery of the telescope and of the real solar system, so that the false theory of the sun and planets going round the earth, which had satisfied the world for 1,400 years, was exploded. Philosophy, too, began to flourish again in the hands of Servetus (1509-1555), Giordano Bruno (1550-1600), to whose memory Mr. Swinburne has dedicated so many of his fine stanzas, and Vanini (1585-1619), and the discovery of the law of gravity by Sir I. Newton, 1642-1727. The study of the Scriptures in their original tongues, the sale of indulgences, and the scandalous lives of some of the clergy at Rome, gave rise to the Reformation; while the new art of printing with movable metal type, and engraving on copper, made knowledge much more accessible.

The human imagery in the Romanesque and Gothic buildings had long before been improved by Nicola Pisano (1205-1277) in the thirteenth century, from the finding at Pisa of a finely-sculptured Roman sarcophagus, which he studied and imitated, whilst in the same century Margharitone (1212-1289), Cimabue (1240-1300), and Giotto (1276-1336) began to give vitality to the old Byzantine painting. The perfection of form in painting and sculpture was brought about by the great artists learning that the ancient masters produced classic perfection by the judicious selection from many models, but whether the Renaissance artists learned the secret from the numerous pieces of sculptured marble and bronze dug up, and from engraved gems found or brought from Constantinople, or from the statements of Aristotle, I know not. Our own art of architecture was made more simple, more refined and elegant, by the infusion of Roman methods by Brunellesco and his followers, though from that day architecture has but slightly advanced, and this advance has not been organic. In other pursuits the advance has been astonishing and marvellous, and continually progressing, while architecture is getting worse, for it was put in the same fetters from which all other efforts of the human mind were set free; before that time in the Middle Ages it had been one of the expressions of the human mind that was free, if not the only one, and we see what freedom then did for architecture in the sumptuous Romanesque monuments and in the marvellous Gothic creations.

I think it may be agreeable as well as useful to you if I give you a description of the

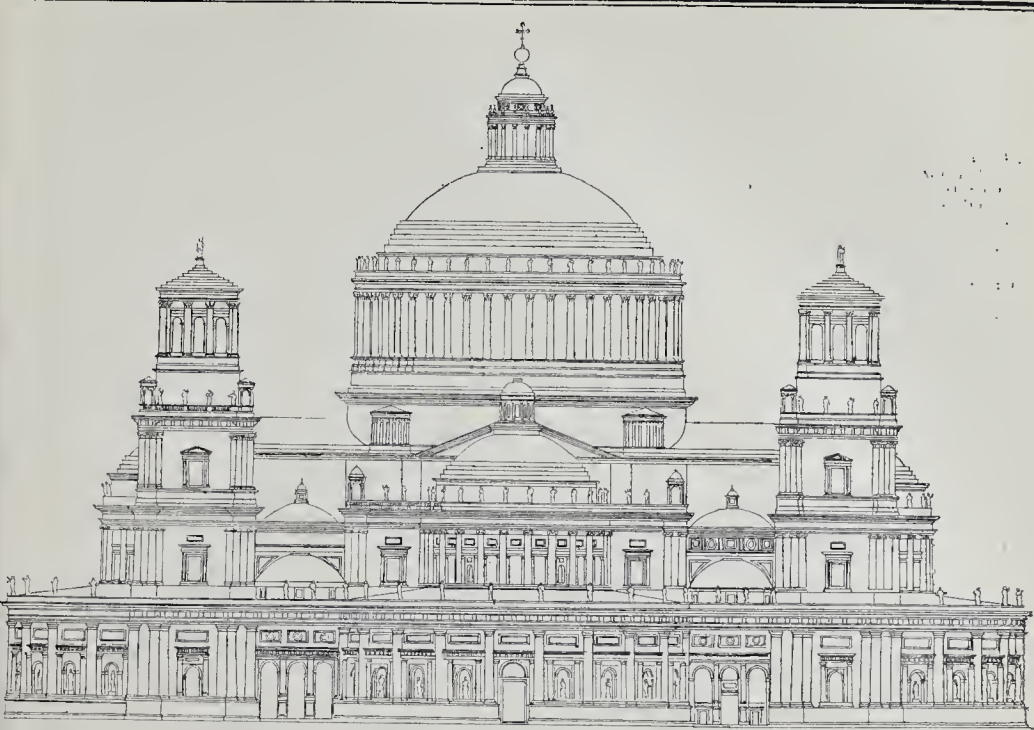
Renaissance basilica of St. Peter's at Rome, with some critical remarks upon it, for it has many claims to your attention. It was begun in the full tide of the Renaissance, at a time when the Papacy was at the height of its power, by Bernardo Rossellino, in the days of Pope Nicholas V., who died in 1455, and was again carried on by Bramante, under Pope Julius II. in 1506. Enormous sums of money were collected to defray the cost of the building from the several countries of Europe, possibly from North and South America, the Islands, and India as well. The most celebrated architects, artists, and amateurs of Italy were consulted about carrying out Bramante's design and several of the same men were engaged on the actual work. It is, I believe, the largest Christian cathedral in the world, is decorated with the most costly materials, while its dome has been looked upon as one of the wonders of the world:—

"But lo! the dome, the vast and wondrous dome.
To which Diana's marvel was a cell."
("Childe Harold," canto iv., stanza 153).

This dome of St. Peter's is visible from Tivoli to the naked eye. The cathedral, too, has the most grandiose approach of any building in Europe.

Every architectural monument must necessarily be interesting to man, for it is built by man for man, in the hope of raising those emotions which are proper to its destination; monuments that are colossal affect him unconsciously by their size, and when he reflects he must be impressed by the daring conception, and by the thought, skill, and labour expended on them; and when in addition to this, the monument has a vast dome rivalling a small mountain, it arouses in him still more wonder at the skill required to make such a mass of heavy material soar in the air. And yet, after having climbed those hundreds of steps that lead from the pavement of St. Peter's to its masonry roof, you feel as if you were walking on the solid ground, while the dome before you is the largest that has ever been raised to that height from the ground, and when you have climbed the steps that lead you to the lantern and look through the eye of the dome on to the pavement below, the worshippers look like ants, while on a clear day you can see from its brazen ball the blue Tyrrhenian sea, and the Campagna with its towns and villages spread out like a map.

Constantine the Great had the first basilica to Saint Peter built on the ruins of the circus of Caligula restored by Nero, and his architect used the place once occupied by the seats on one side as the foundation of the outer wall and the two adjacent aisles of the basilica. Bramante got two of the piers to support the



Elevation of Bramante's Design for St. Peter's, as restored by Baron de Geymüller.

dome on the same foundation, knowing that the Romans always put excellent foundations to their buildings.

In the days of Pope Nicholas V., who was elected Pope in 1447 and died in 1455, whose name was Tommaso Parentucelli, and who was born 1389 and died 1455, the old basilica was dilapidated, and he was of opinion that a more magnificent basilica should be raised in the centre of Christendom, partly for holding a greater crowd of worshippers and partly to show the great skill the Italians had attained in the fine arts. The Pope was acquainted with Bernardo Gamberelli, a celebrated Florentine sculptor and architect, who was known as Bernardo Rossellino (1499-1464). He worked with the great Leon Batista Alberti, and executed the beautiful tomb of Leonardo Bruni in Santa Croce, Florence, of which there is a cast in the South Kensington Museum.

Bernardo Rossellino designed a new St. Peter's for Nicholas V., but the foundation of the original apse only was executed, and that is all of Bernardo Rossellino's architectural work for St. Peter's that I have ever seen drawn, except the plan of it in Baron de Geymüller's book, "Les Projets Primitifs pour la Basilique de St. Pierre de Rome par Bramante," on which Bramante had worked, and, in fact, until his designs have been found we must consider Bramante's as the first design. According to the Baron H. de Geymüller, who believes himself to be the only writer of a life of Bramante who had seen all his works, it was Bramante's boast and not Michelangelo's that he would put the dome of the Pantheon on the vaults of the Basilica of Maxentius. The vaults of the Basilica of Maxentius were of the greatest span, and the Pantheon was the largest dome then known to the Italians, so you will find 83 ft. a span that the Tuscans tried to equal, and the dome of the Cathedral at Florence, a little less than the Pantheon, always aimed at in the revived Roman of the Early Renaissance.

Bramante's name was Donato Bramante of Urbino, and he was born 1444 and died 1514, aged seventy. He was a compatriot, some say a relation, of Raphael. As the first stone of the present basilica was laid by Pope Julius II. in 1506, Bramante had only eight years at the end of his life to complete his design and to see

it carried out, and in the latter part of his life he had palsy; but even that was only one of the misfortunes that happened to him. His plan was a Greek cross, which met with opposition in favour of the Latin cross, and no doubt there were other objections, both artistic and ritualistic, and most of the architects, artists, and amateurs, gave sketches or models of their own. We can but regret that Bramante did not have a complete set of drawings and a perfect model made to show his original design, as he was undoubtedly the greatest architect of the Renaissance. The Pope forced Michelangelo to have a perfect model made of his dome, and one is still in the model room at St. Peter's, showing the iron ties to the buttresses, but I cannot say if it is the original.

I was bound to try to give you some sketch of the state of men's minds when this great work was begun, and it would have been interesting to the architects to hear the complete history of this building, if only to show them that we are not the only men who have been harassed and thwarted, but that our forerunners and betters have even been worse treated; but to write a history of the designs and execution of St. Peter's would take at least ten years to read up, as the sources of information are contained in works not to be numbered, and often a whole book has to be read through to furnish a not very important passage on the subject. We ought, therefore, to be thankful to Baron de Geymüller for the immense pains he has taken to give us a complete life of Bramante, of his work on St. Peter's, and the influence he exercised on succeeding architects of the building and on Europe generally, and to Letarouilly for his "Vatican."

The present basilica is externally of travertine stone, its front consists of a Corinthian tetrastyle portico, with a pediment and two bays beyond on each side, finished by deeply projecting pilasters, and beyond an archway at each end flanked by a pilaster. Between the columns a wall is built up so as to leave only three-quarter columns with windows on the first floor, with balconies, from one of which the Pope's blessing is given, the whole front is crowned by an attic with windows. The front is by Carlo Maderno, and is said to be 379 ft. long and 148 ft. high. On the pedestals of the crowning balustrade our

Saviour and the Twelve Apostles stand, each statue being 18 ft. 6 in. high. The narthex is 468 ft. long, 50 ft. wide, and 66 ft. high. On the pavement of the nave of St. Peter's, its length and that of some of the principal cathedrals and churches of Europe are given:—St. Peter's, total length 613 ft. 6 in.; width of nave 87 ft. 6 in.; width of aisles 33 ft. 9 in.; St. Paul's London, length 520 ft. 6 in.; Milan Cathedral, length 443 ft.; St. Paul's, Rome, length 419 ft. 3 in.; St. Sophia, Constantinople, 366 ft. 6 in.; length of transept of St. Peter's 446 ft. 6 in.; the height of the nave of St. Peter's by the door 152 ft. 6 in.

The dome of St. Peter's is said to be 139 3/4 ft. inside diameter, height from pavement to base of lantern 405 ft., from pavement to top of cross 448 ft.

Although the present basilica of St. Peter's was begun in the time of Nicholas V. who died in 1455, nothing of what B. Rossellino designed except the foundation of the choir remains, and the present one of Bramante may be said to have been begun in 1506 by Julius II. when he laid the first stone. The basilica was consecrated November 18, 1626, by Urban VIII., being 120 years from the laying of the first stone by Pope Julius II.

During this time there were twenty Popes: Julius II., Leo X., Adrian VI., Clement VII., Paul III., Julius III., Marcellus II., Paul IV., Pius V., Gregory XIII., Sixtus V., Urban VII., Gregory XIV., Innocent IX., Clement VIII., Leo XI., Paul V., Gregory XV., Urban VIII.

St. Paul's, London, only took fifty-eight years and was under six sovereigns; and we may be thankful for one good action of James II.—he preserved us from Wren's original design. Although Wren was bitterly assailed by pamphleteers, he was enabled to carry out successfully his second design.

That pinchbeck Michelangelo, the Cavalier Giovanni Lorenzo Bernini, by the order of Pope Alexander VII., surrounded the square in front of St. Peter's with these porticos that form so grandiose an approach to it, of which I shall say something hereafter.

As Bramante died March 11, 1514, from at least that date all personal work must have ceased, and every intention of his must have been gathered from the drawings on the left, and any of his merely . . .

tions must have been learnt from his assistants, pupils, and friends. Raphael was both a pupil and a friend, and Bramante expressed his desire to Pope Leo X. that Raphael should be entrusted with carrying on the work on account of his mastery of construction. All we know of Raphael as an architect is the Pandolfini Palace at Florence, which he is supposed to have designed; and, if Baron de Geymüller is right, the Farnesina Palace at Rome, usually attributed to Peruzzi.

Baron de Geymüller has not only gone through all the drawings, sketches, and models of St. Peter's he could find in Europe, but has also looked over the sketches of the artists who visited Rome, and who have shown the works at St. Peter's in progress, and has given us as well a plan showing what each architect has done, and I presume when the architects were known and their work is not recorded by him on his plan, the work done did not materially alter Bramante's arrangement, for he only shows the work of the following:—

B. Rossellino.....	1450
D. Bramante.....	1506 to 1514
Antonio da Sangallo.....	1516 to 1546
Michelangelo.....	1547 to 1564
Carlo Maderno.....	1607 to 1622
and	
Giovanni Lorenzo Bernini.....	1626 to 1680

Fra Giocondo and Giuliano da Sangallo were appointed to assist Bramante during his illness—November 1, 1513, and January 1, 1514—and after his death on March 11, 1514. Raphael and Giuliano da Sangallo replaced him as architects at St. Peter's. Giuliano da Sangallo retired July 1, 1515, and Fra Giocondo died the same day. The four piers of the dome were built and vaulted over, and had at least a pendente up to half the circle in the pendente, as shown by Martin Heemskirk's sketches, dated by Baron Geymüller 1520 to 1536; and Raphael died April 6, 1520.

As illustrating the extraordinary versatility of the artists of the Renaissance, there is a story told about Giuliano da Sangallo, who was a carpenter by trade, which then involved the carving of wooden statues and the inlaying of wood with lighter or darker wood in ornamental patterns, which had just become the fashion, artistsmen as the best hand. The stalls were being put up in the cathedral of Florence, and Lorenzo the Magnificent used to look in at the work after his dinner, and talk to the craftsmen, who said it was a shame that Giuliano Giamberthi, the best inlayer, was not employed, and Lorenzo said, "Send him here," and he was employed, and Lorenzo was struck with his cleverness and resolution. One day Lorenzo said to him, "Giuliano, the Duke of Calabria has declared war against me, and is besieging one of my border castles, which I well know is much dilapidated, so pick up your tools, go there, and repair the castle; my gunners, too, are very bad, so when you have repaired the fortifications put my gunners in the right way." Giuliano did so, and when the Duke found the fortifications were repaired and the gunners aimed well he raised the siege. Lorenzo then set Giuliano to supply some town with water, and afterwards got him to design and carry out a monastery outside the Porta San Gallo. Giuliano found in the trenches a Classic Ionic capital of peculiar form, had it copied and used for the monastery, and after this time whenever Lorenzo saw him he called him "San Gallo." The Florentines were proud of their family names, so one day Giuliano said to Lorenzo, "Why do you always call me San Gallo? My name is Giamberthi, and I shall lose my family name." To which Lorenzo replied, "This is not losing your name, but gaining a more honourable one for yourself," and after that he and his brother, the old Antonio, called themselves "San Gallo," and their nephew, Antonio Piccone, called himself San Gallo as well.

I give you now some illustrations of St. Peter's, with plans and views of some of the Gothic cathedrals and churches, for you to see how small the Gothic points of support are to those at St. Peter's.

THE LATE MR. J. BURNET.—A correspondent in Glasgow points out that in the report of the Institute meeting in our last issue we gave the name of the deceased architect as "Mr. J. J. Burnet," whereas the name of the senior of the firm who is dead was Mr. John Burnet. We reported the announcement, however, as made by the hon. secretary, who gave the name as we printed it.

COLOUR IN ARCHITECTURE.*

THE present paper makes no pretence to be anything more than a starting point for discussion. There are certain features of architectural practice which are of interest, not to architects only, but to the members of the allied professions who co-operate with them in their work. The fulfilment of the task of the master builder involves many subsidiary operations on the part of the carver, the painter, and the decorative and industrial artist in general. Some of this subsidiary work is specially attractive, and is of a kind that appeals with greater force to the taste of the public than the more purely architectural qualities of the whole structure. There is accordingly some danger lest the essentially subordinate character of all this decorative work should be misunderstood, and the predominance of what is architectural in the architectural monument a little obscured. It will be remembered that the late John Ruskin in his "Lectures on Architecture and Painting," and also in the preface to the second edition of the "Seven Lamps," enunciated an extraordinary paradox to the effect that this decorative work just referred to as subsidiary is, in fact, the essential part of architecture. "Artistic and rational admiration" of a building, he stated, "attached itself wholly to the meaning of the sculpture and colour on the building. . . . The fact is," he says, "there are only two fine arts possible to the human race, sculpture and painting. What we call architecture is only the association of these in noble masses or the placing them in fit places." No one in the present day regards this famous utterance as anything more than an example of the aberration of genius. This summary condemnation of "what we call architecture" in the preface to one of the most interesting and suggestive books ever written about the art is not accepted even by pronounced Ruskinians; yet there must have been some reason for the assertion, some influence abroad in the artistic atmosphere of the times which suggested the paradox. This influence exists, and is perhaps still more potent in our own immediate day than it was half a century ago. It is the influence of painting.

Painting may mean two things. It may mean colour, or it may mean the life-like presentation of natural objects. It is in the latter aspect that we find it presented chiefly in the writings of Mr. Ruskin, who is possessed throughout with the spirit of naturalism, but in the present day, painting appeals to us not so much as an art of representation as in its more refined manifestations through pictorial effect and colour. In these aspects of it the art of painting is exercising to-day an overmastering influence, in which its only rival is music. It is as pre-eminent in public estimation as it was in the Italy of the fifteenth and sixteenth centuries, and it tends to affect the other arts with a desire to imitate its characteristics. The picture is so attractive in the eyes of the public, that those who serve the public in the other arts of form cannot help trying for pictorial qualities. The strength of the influence of painting on sculpture was very marked in the statuary of the recent Paris Exhibition, and the same influence is by no means inoperative in the case of architecture. Pictorial effect, or what architects call "picturesqueness," is one direction in which this influence is exercised, and another is colour. To aim at a pictorial use of colour in architecture is in accordance with modern tendencies. The fashion of the day tends to the exaltation of the picturesque in the arts generally, and there is of necessity a likelihood that the analogy of painting may be pressed too far, and the canons of pictorial art applied too crudely to the other arts, the principles of which are in many respects essentially different.

This being the case, it may be worth while asking the question, What after all, is the true place of colour in architecture? It is the aim of what follows to facilitate the discussion of this question by clearing it from some of the confusing side issues which tend to complication, and pointing to some considerations which must form the groundwork of any useful discussion. The main thesis of the paper may be stated for the sake of clearness at the outset. It is argued here that in colour we have an element of architectural effect of great artistic

possibilities that is at the same time not an essential element of architectural effect. In other words, colour is not necessary to architecture, though to certain forms of architecture it may add a considerable æsthetic charm. These forms of architecture to which colour is a useful auxiliary are not the highest forms. The nobler the architectural qualities of a monument, the less demand is there for any such adjunct. Architecture, it is maintained, is an art of form, not of colour. All that is really architectural in architecture is form; the only quality that may claim a place beside those of form is not the quality of colour, but that of texture, and texture, as we shall see, is much more inherent in a fabric than colour. The architect who is to lift his art in the present day to the level, say, of the art of Wren or of Bramante should stiffen himself even into asceticism in the resolve to make his work primarily architecture, not painting; that is to say, a great austere art of form, expressing itself in imperishable stone, not a lovely and attractive toy, however gaily dressed in the hues and shimmer of pigment or of gold. At the risk of seeming to burden the paper with too much theorising, we may devote a few moments to the fundamental question, What are the essential elements of architectural effect? What qualities must a structure possess before we can term it a work of architecture? Mass is, doubtless, the first element to notice, but this it is not always possible for the designer to secure. The grandeur gained by imposing size, the sort of grandeur which is the primary impression one receives from the exterior of Mr. Bentley's new cathedral at Westminster, is not always within the architect's power to compass; it depends on the nature of his task and the resources of his clients. The element next in order—proportion or composition, *i.e.*, the subdivision of the mass and the grouping of the parts according to an artistic scheme—is in the designer's own hands, and if he fails here nothing can really save him. It is the chief artistic function of the architect so to distribute the spaces of his building that its outward show may satisfy the eye with a fine æsthetic effect of proportion and grouping, and great success here, as in the case of Sir Christopher Wren, lifts the artist at once to the highest rank among his fellows. This is, however, not in itself enough. To subdivide a mass and group its parts and its openings in pleasing relations is not enough, if the parts are mere plain parallelepipeds and the openings are bare unframed holes cut in a wall. A certain apparatus of minor features is requisite for the purpose of lending accent and significance to the divisions, and doing all the artistic service to the structure which can be rendered by frame, or border, or plinth, or cresting. The most important of these features is the moulding. Mouldings explain the use and significance of a fabric by emphasising its parts and divisions, which all depend on the purpose it has to serve; they clear the construction by the accent they throw on points of junction, on base or crowning member; they minister to beauty through their aid to composition in linking or severing part and part, in framing the naked aperture, in enriching by repetition in bands of light and shade the pleasing or significant line. Without these features, of which the moulding is the chief, the structure cannot be artistically set off and clothed, and without the aid of these the æsthetic effect of architecture cannot be fully obtained.

It is maintained here that the qualities just indicated are all that are essential to the æsthetic effect of architecture, and that no further element, such as the element of ornament or of colour, is really needed. That a building without ornament or colour can give the full impression of architectural beauty is perhaps a hardsaying, and many would hesitate before surrendering as non-essential these attractive features. Wren's work, however, brings the matter to a practical test. There is no colour and very little ornament—and this all of a commonplace kind—on Wren's City churches; but do they on that account take a lower architectural rank than would otherwise be the case? Where is the decoration or colour on the High School at Edinburgh, or on the east front of the Old University? Robert Adam designed for the latter decorative sculpture in the form of colossal statues on the balcony above the columns of the portal, but they have never been added. Is the building architecturally any the worse for their absence?

* A paper read by Professor Baldwin Brown at a meeting of the Edinburgh Architectural Association on January 16.

The Greek temple at Paestum in Southern Italy exhibits now no ornament or polychrome decoration, yet it is one of the most perfectly satisfying structures to the architectural sense that the world has to show. Among mediæval buildings there is a very conspicuous test-case which gives us a definite issue. The two churches of S. Marco at Venice and St. Front at Périgueux in Western France are curiously, though only accidentally, alike in form, but no difference could be more striking than that between the artistic effects of the two interiors. In S. Marco, golden domes are upheld on jasper walls, and hang over a pavement fretted with the glowing tints of oriental marbles. The effect of colour is of a sumptuous richness elsewhere univalued. In contrast to this the interior of St. Front is one of puritanic plainness. There is absolutely no colour, and hardly a touch of ornament. All is pure form, and dependent for its æsthetic effect on the most austere architectonic beauty. Yet let us hear what is said about St. Front by the authors of the recent monumental history of ecclesiastical architecture in the West. It is one of the few buildings about which these writers kindle into something like enthusiasm. "In all the world," they exclaim, "there is no architectonic creation that in pure beauty is its equal. . . Here is architecture in the absolute, disdaining all collaboration of the decorative arts. One or two unpretending plaster-caps, only what is barely necessary in the way of mouldings to mark the line of springing of the arches—that is all the detail; it is probable that no provision was ever made for adornment in colour. The builder has given himself over entirely to his artistic sense of form, to a harmony of clearly defined proportions that carries its own sufficiency with it. One can linger long in this incomparable interior without ever becoming conscious of its entire bareness of decoration, and when we do feel this, it gives us no sense of poverty, but only of the inevitable. This austere artistic realism strikes us with all the more admiration in that it lifts itself to its lonely height out of an age that delighted above all things in decorative variety, in show and glitter, in childish pleasure of the eye. The unknown master of St. Front possesses in all the wide field of architecture only one compeer of equal mind, the great Bramante. To Bramante, also, the architectonic idea presented itself in such purity, that all ornament seemed to him a needless parade, and of artistic details only such were allowed as seemed necessary for the earthly clothing of the Ideal."

If there is any element of architectural effect after composition and details that may claim to be of the essence of the art, it would not be decoration nor colour, but surface-quality or texture. The surface of a building material should be so handled as to express the character of that material, and it derives from the intrinsic excellence of the material thus expressed a certain æsthetic value. This value is enhanced when the history of the fabric has been written there by the caressing fingers of time, and the surface has gained that expressive play of light and shade which makes a bit of Greek or mediæval walling in itself a thing of beauty. But building materials to have beauty of surface-texture need not be weathered. The Parthenon must have had this beauty when quite new, for the surface of the finely dressed but unpolished marble was an index to the quality of the material. Here in Edinburgh, look at the half columns on the two buildings on the east side of St. Andrew-square on either flank of the forecourt of the Royal Bank. They have been there for a hundred years but time has not corroded them. A mellowing influence it may have exercised, but the surface quality is still the outward expression of that molecular structure on which the excellence in a utilitarian sense of the building material depends. Or, to take a London as well as an Edinburgh instance, we may note the surface quality assumed by Portland stone in the atmosphere of the metropolis. The alteration of a greyish white and rich sooty black on the exposed and protected planes is singularly telling, and St. Paul's, St. Martin's-in-the-Fields, and other structures in this material owe not a little to this effective peculiarity. Why other building stones should in the London air degenerate to a lifeless mud-colour, and the Portland stone tell out to all time so bold and right, I do not know, but the phenomenon seems characteristic of the material, and as

such is its expression—an outcome of its inner constitution, in virtue of which it becomes the trusted vehicle of the architect's highest conceptions.

This texture is thus a noble and expressive æsthetic quality, very near to the essential character of architecture. It has been necessary to dwell upon it because it is often confounded with the quality of colour, with which, however, it has only an accidental connexion. It is true, of course, that most materials weather to colour as well as to beauty of surface. Owing to the fact that Pentelic marble contains minute particles of iron, the old Athenian buildings have assumed in time a rich golden hue, now known to be nothing more nor less than rust; and every one has admired the beautiful tints of old tiles and brickwork in our own domestic architecture. This is, of course, in the nature of a happy accident, not a piece of calculated effect. The case is different when certain materials have from the first inherent beauty of tint. To build with such, is necessarily to build with colour, and the element of colour comes here inevitably into view.

The general tint of a building stone, the hue of brick or fling, undoubtedly count for a good deal in architectural effect; and where two materials are equally good from the tectonic point of view, the one with a more pleasing colour is immeasurably to be preferred. The Redhall stone, so much used in the Edinburgh buildings of three generations back, has at times a beautiful golden hue, which certainly accounts for part of the architectural charm of the north side of Charlotte-square or the Register House. The cold grey of the same material from other beds, as seen in the High School, is in itself, perhaps, a little less pleasing. But would any practical architect be so far affected by this as to reject the grey Craigleith sandstone for an inferior substance of a warmer hue, like the reddish stone now so much employed? Surely the harder, more durable, and in every way finer material would on architectural grounds be preferred? In like manner would any London architect who could build in Portland stone reject it because of its coldness of hue, or in monumental work prefer brick to stone because of its warmth of colour? The gleaming white stone so much used in Paris, as in the effective exterior of the new Orleans railway station, is a beautiful material though entirely colourless. The inherent colour of a material is not, like texture, an index to its actual constitution. It is more of the nature of an accident than the outward expression of structure, and ranks lower in architectural importance than texture. A good building material will look well and weather well but need not be of any distinctive colour. Only when other things are equal should considerations of the colour of a material influence the choice of it. If, as is here contended, the architect who has a sense of the monumental will choose his stone or bricks primarily for their characteristics as building materials, and only in a secondary sense for their colour, then colour even in this most natural form of it is acknowledged to be a non-essential, though a valuable, quality.

We pass now from colour inherent in materials to colour deliberately applied either as incrustation or in the form of pigment.

There will rise up here before the mind's eye, like fairy pavilions at the wave of a genie's wand, a crowd of lovely structures, old and new and of every land, of which colour is the distinctive charm. Colour in paint or inlay or panel or film of gold glances and glows from them all. There are the pylons of Egypt gay with painted figures and picture script; the stuccoed walls of Babylonian palaces encrusted with enamelled tiles; the Mycenaean house that sparkled with metal appliques and inlaid pastes of oriental blue. The Greek temples were not pure white, but were pranked with coloured guilloche or fret and with golden stars on roofs of skye blue, and threw up their decorative sculpture from a background of full vermilion or ultramarine. The huge Alexandrian piles of brick and concrete were faced with veneers of oriental marbles of every hue, and the same materials, sawn out of every outland quarry, shone on the walls and pavements of Imperial Rome. The new Rome of Constantine rears above her varied marble walls domes all opulent within with golden mosaics, while the Early Christian artists of Ravenna with finer taste relieve against a background of blue their stately pictured forms

of Apostle and of Saint. While the Byzantine tradition of colour, mingling with old oriental elements, kindles the golden lights and fires the deeper gules and azure of the fretted Moorish roofs, and further east the glories of Babylon are revived in the tiles and inlays of Bagdad or Ispahan, in the mediæval churches of the north the interiors were aglow with paint and gilding in the carved woodwork, and with blood-reds in the hollow of the sculptured leafage and the mouldings, while the windows poured in a coloured light thrown back from the deeper hues of Saracenic hangings between the pillars of the nave arcades. The chapels and the halls of the Italy of the early Renaissance were habited within in every part with mural pictures, framed and extended by well-composed decorative motives. And, apart from these more ambitious structures, what a feast of colours, brilliant or subdued, is offered by the domestic buildings of wood and brick and tiling in all the lands of the North! Garish on Norwegian or Russian timber-houses, more mellow on the tiled cottage of Surrey or on Scottish harling, the tints of the homely fabrics seem to join with the splendours of church and palace to annunciate the universal rule of colour.

With the flag of colour flying so high upon the mast, how can a reader of a paper before an architectural audience venture to dethrone this element from among the essentials of architectural effect?

It must be said in explanation that there is no desire here to depreciate in any degree the æsthetic charm of colour. No admiration can be too great for the beauties of colour, sumptuous or delicate, which the various structures just glanced at afford to us. We have, however, an argument in hand and must consider the subject from every point of view. Plato often asks in his dialogues, Whither is the argument leading us? It is not what we secretly desire to prove that will necessarily come to light. We must follow the argument, and where it lands us we must rest. Now the argument here seems to lead us to a conception of architecture that rises in monumental dignity above the need of these artificial adjuncts, to an art that at its best is an art of form, and only an art of colour when its own best effects are denied to it.

A consideration of the sort of buildings noticed above does nothing to alter this conception. The majority of them are not of the most monumental materials, and the significance of this fact we shall presently see. The Egyptian temple, it is true, was of stone, but the forms of it copied in the crudest fashion far slighter structures that preceded it. The storied wall of the pylon is just a cunningly-woven curtain imitated in stone, just as the columns of the halls within, though of vast bulk, are simply overgrown papyrus reeds without real monumental character. The Greeks, when they petrified the timber and mud-brick forms of their temples, had the wit to stamp upon them an essentially lithic character, so that they not only were stone, but looked stone. They do not go so far, however, as to abandon the old practice of painting upon them ornaments. The use of pigment in this fashion on the finely grained Pentelic marble was a matter rather of tradition than of artistic choice. We cannot safely found any æsthetic theory as to the colouring of stonework on this feature in Hellenic practice, because the builders of the first monumental temples were in a way forced into this use of colour by its established vogue in the earlier and still common structures in wood and plaster. In the case of the mediæval churches in the lands north of the Alpine barrier, we have no knowledge as to the extent to which colour was actually applied to the exterior. Traces of polychromy on the sculptured figures outside the French cathedrals were observed in the last century, but I know of no other evidence. The details of the interior stonework were certainly often treated to a considerable extent with colour.

With the exceptions just noticed, all the notable instances of polychromy in the buildings instanced are of colour applied in veneers of a rich over a poorer material, or in the form of pigment on to wood or plaster. It is impossible to pretend that the marble veneer—invented, it seems, at Alexandria, spreading thence to Rome and Byzantium, and revived later in mediæval Italy—is a satisfactory architectural expedient. Mr. Ruskin, who was so severe on shams, might have found in the beloved Florence some very appropriate themes

* Dehio u. von Bezold, Kirchliche Baukunst des Abendlandes. I. 337.

for sarcastic comment. Is there any architect whose ambition would be satisfied by building a church with a western façade like that of the Duomo at Florence till they venerated it up a few years ago? Nor is the surface of stucco over rubble or brickwork a very noble form of artistic expression. Buildings of wood, though full of delightful æsthetic character, are not monumental.

The point which emerges here is of the essence of the argument of this paper. From the side of the æsthetics of architecture, and from the side of history also, the argument seems to lead us to the conclusion that monumental stone architecture, where the outward aspect of the fabric expresses the structure, and the surface-quality is an index to the nature of the material, not only does not demand but rather rejects the aid of colour, while, on the other hand, the less noble materials just indicated require, or, at any rate, open themselves to, an application of the kind. If a veneer is used, colour must almost necessarily be considered in its selection. Colour justifies the employment of such incrustation, whereas if used to give the impression of substance it would be a mere fraud, because the actual substance behind it is of quite a different and inferior character. When the material is used primarily for the sake of its fine colour the logic of the situation seems really to require its employment in thin slabs, and so to justify the veneering process. Such fine material is *ex hypothesi* rare, and economy demands that the most should be made of the available supply. Wood and iron or steel when exposed to the atmosphere absolutely need some coating or surface treatment to preserve them, and when this is provided by paint it would be absurd not to take full advantage of the great characteristic of paint, its colour-producing quality. Plaster does not perhaps need colour, but in an artistic sense it seems to thirst for it. In dealing with these materials we are at once transported, as it were, into the world of colour, and have nothing further for the moment to do with architecture in the purely monumental aspects with which we have been dealing. We may turn from this ideal of architecture as a pure art of form to consider the application of colour to materials which we can hardly imagine as existing without it. The subject of colour schemes, harmonies of colour and the like, cannot of course be entered on. The considerations with which we are here concerned are prior to all such special questions of artistic judgment.

On the treatment of woodwork a good deal might be said. Wood, like stone, when of fine substance, has its own surface-quality, and one admires it in the rudely-dressed oak beam of the old-fashioned cottage, as much as in the polished mahogany of a Chippendale chair back. Wood weathers delightfully on exteriors, but its surface has commonly been treated with a drench of some kind if not with pigment. Examples, in our own country and abroad, of the polychromatic treatment of woodwork are too well known to need mention here.

Among metals, bronze or copper and lead may be left to themselves to acquire by time their fine patina, but iron or steel are terribly sensitive to the damp in the atmosphere. Even under the favourable climatic conditions of the drawing-room fireplace, the housemaid has hard work to keep the steel grate up to her ideal of shininess. Exposed ironwork practically must be painted, and the buildings of the two last Paris exhibitions showed some notable examples of polychromy in the treatment of this material.

Of far greater importance is the question of the colour treatment of plaster. As a mere matter of acreage, the surface of plaster, at any rate in the interior of our buildings public and private, is far greater than that of all other materials put together, and its polychromy is one of the most practical of artistic questions.

It has just been said of plaster that in an artistic sense it seems to thirst for colour. What is meant by this will be seen if we cast our eyes backwards for a moment, and take a glance at the past.

In our treatment of plaster we have degenerated from earlier practice. In classical times, when plaster-work, at any rate in its technique, was better than it has ever been since, the application of colour was evidently held to be the normal finish of the plasterer's task. Vitruvius contains a passage on the subject that is of the highest importance and interest.

He gives a description of the methods of mixing and applying the successive coats of plaster to a wall—they are seven in number and the last is made with lime and marbledust, and finally polished till the surface of gleaming white would actually reflect the beholder's face as in a mirror. But the description does not stop here. Vitruvius goes on to represent the painter's work as following at once on the plasterer's, as if the same hand were to be engaged on both. As each successive coat of stucco had been laid on before the previous one was dry, so now the painter must be prepared with his pigments and brushes to apply his colour on the finely-smoothed but still wet surface of the finished intonaco. Granted that all this is deftly done—that the plaster is duly macerated, the coats laid on at the right moments and fairly smoothed, the colours carefully applied the instant the final layer is brought up to its exquisite surface—then will the work abide for ages, the stucco will not blister or crack nor the colours wash off or fade, and the whole will preserve its dainty brightness unroughened and undimmed.

The process Vitruvius refers to is, of course, that known as a *fresco*. It is the most simple as well as the most effective of all processes of painting, and for interiors, at any rate in the form of flat tints or simple decoration if not of the mural picture, there is no reason why it should not be employed to-day as it was of old. If it were an established principle that no plaster work was to be considered finished till it was tinted a *fresco*, what tasteful rooms and staircases we could have at a nominal cost!

There is no painted surface (save, of course, that of a fine oil picture by a great master) so artistic as *fresco* on well-finished plaster. It does not make a skin over the surface with a streaky texture of its own like the "one, two, or three coats of oil paint" we are so familiar with, nor roughen it up with the surface, pleasing enough but coarse, of distemper. *Fresco* has its own characteristic semi-lustrous face, but when laid in flat tints leaves to the ground its own proper surface. There is no mystery about colouring in *fresco*. Here are some bits of ordinary room-wall plaster painted over a long while ago with common earth-pigments, mixed with water alone. There is no binding material or varnish of any sort, yet the wet finger will not bring any of the colour away, and twenty years has brought no change or deterioration. Some old bits of Roman plaster coloured a *fresco* are shown for comparison.

In the Vitruvian plaster work the finely-finished surface of the final coat continued even when tinted to play its part in the artistic effect, for the ancients evidently considered that its polished whiteness would gleam through the transparent veil—it is not a coat or skin—of pigment. This use of the white ground to keep up the brilliance of the final effect is in accordance with those sound artistic traditions which prevailed in the past, so long as the arts and the crafts were one. To carry as much as possible of the value of one process on into the next is a maxim as sound from the point of view of economy as of art. If there are modern decorative painters to whom the plasterer is a servant rather than a fellow-worker, and who get their lights by loading with white upon a heavy bed of pigment they might take a lesson at the hands of the classical frescoist.

The polychrome treatment of plaster culminates in the mural picture, in *fresco* if possible, but, if not, in some one of the practical modern processes which permit the work to be done directly on the wall. The picture painted in the studio on canvas and then gilded in its place cannot but be regarded as a *pis-aller*, a modern confession of our degeneracy in the decorative art. There can be no attempt to discuss here the special æsthetics of mural painting, its conventions, the extent to which it may admit perspective and light-and-shade naturalism and action, or the relative places in a scheme of the storied panel and the more purely ornamental framing and filling. Only those features of it may be mentioned in which the architect of the building would feel a special concern.

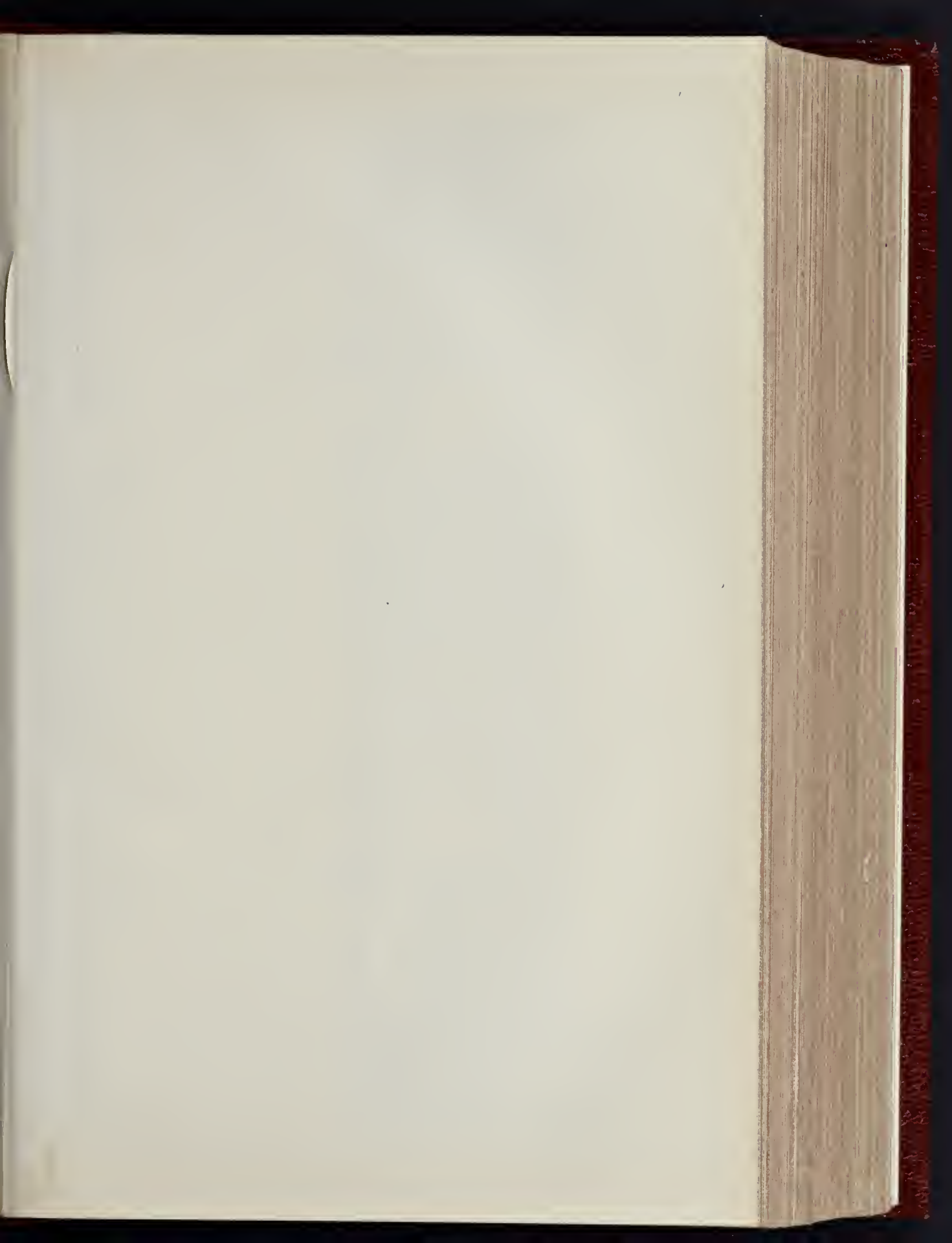
It stands to reason that over all undertakings of the kind the presiding genius must be the architect. He need not concern himself much about the pictorial execution of the designs, but is bound to be greatly jealous in the matter of colour. Where he has gained by the use of his own materials a certain colour-effect

he is bound to exact from his decorative painters a due correspondence with it in their own scheme. He has, however, the primary and more essential task of setting out the spaces that the applied polychromatic decoration has to fill. He must assuredly make this part of his design. We have seen already that in the view of architecture taken in this paper, such polychromy is not an essential part of his effect, either on the exterior or interior view. If he chooses to finish interior and exterior alike with fine stonework, expressing in form and texture both the structure of the fabric and the character of the material, then the decorative painter and the inlayer and the glider have no business in the place. It must be for him to decide what he wants from them, or whether he needs their aid at all. An excellent example of what should always be done in this matter is to be found at the Catholic Apostolic Church in Edinburgh, built by Dr. Rowand Anderson, and now in course of decoration by Mrs. Traquair. Here is an exterior in monumental stonework, with pleasing colour in the material, but without polychromy. In the interior the spaces are mapped out for decorative painting by the use of plaster and the omission of dressed stonework. The painter comes and proceeds with confidence in assured accordance with the main design. Hence when the decoration is finished on wall and roof alike the result will be one of the most complete and interesting works of art that is anywhere to be seen.

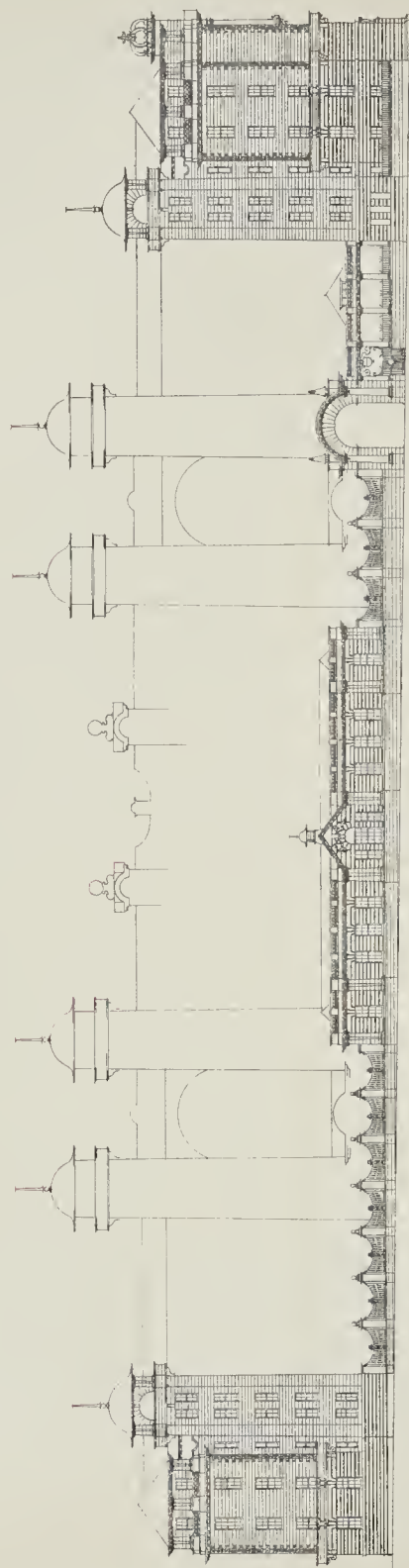
A conspicuous instance on the other side is the interior of St. Paul's in London. The difficulty which has been felt here all along, and which is still unsolved, is due to the fact to which it is no use shutting our eyes, that the designer of the building had no idea of a scheme of polychromatic decoration. He finished the whole of the interior, save the domes of the roof and their spandrels, in fine stonework, and left no hint in word or deed that he ever meant it to be coloured. The domes and spandrels are finished in plaster over brick, and there is distinct documentary evidence that he contemplated painting on the smaller ones, and on the great dome mosaic. Richly coloured Greek marbles we also know were ultimately to be used in the canopy over the altar. In view of the importance of the matter in question, it may be worth quoting the words of the *Parentalia*. On page 291 we read that (under the cupolas of the roof) "the arches and wreaths being of stone carved, the spandrels between" (and of course the domes themselves) "are of sound brick invested with stucco of cockle-shell lime, which becomes as hard as Portland stone, and which, having large planes between the stone ribs, are capable of further ornaments of painting if desired;" while in a note on page 292 we are told that "the judgment of the surveyor" (Sir C. Wren) "was originally, instead of painting in the manner it is now performed, to have beautified the inside of the cupola with the more durable ornament of mosaic." This is really all the encouragement in an affirmative sense that the decorators get from the architect himself, while the walls of the noble church are simply eloquent in their protest against the paint and gilding and marble veneers and stencilling and script, with which they have periodically been treated in the past, and are now actually attacked. With time, the stone has taken on itself "a most beautiful patina", and is far more lovely to-day in colour than any coating which is likely to be laid over it. It has everywhere, where left untouched, the surface-quality of a noble and efficient material, and it is positive vandalism to overlay this with heavy unrelieved gilding such as is now being applied. The words just quoted from the only authority which exists about Wren's intentions ought to be on this point conclusive. There is a distinction drawn between the carved wreaths which are of stone and the surfaces of plaster. The latter may be painted, but the inference is very strong that the stone wreaths were regarded as needing no such addition.

There are two plausible motives for the treatment now apparently adopted, but it is

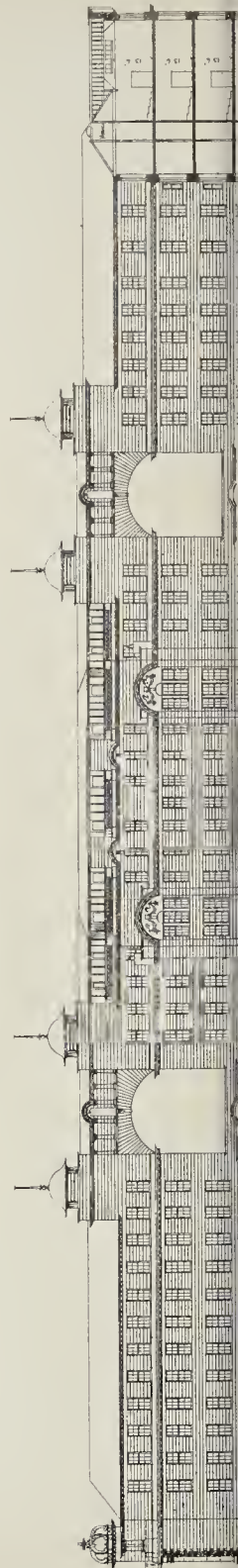
* The Portland stone in the interior of St. Paul's has taken upon it a warm but light shade of golden brown, that is not like the usual patina of the material when used in exteriors. It is not a uniform flat tint, but is pleasantly varied. Whether this is due to time, to the effect of the London atmosphere, or to the varying treatment in different places in the past, does not concern us. As it is now, it satisfies the eye, and would not be improved by spots of gilding or inlay.

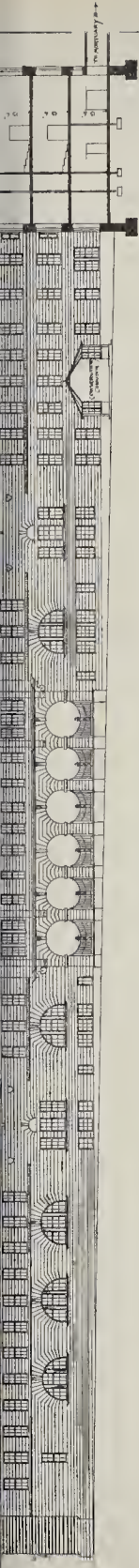


THE BUILDER, FEBRUARY 2, 1901.



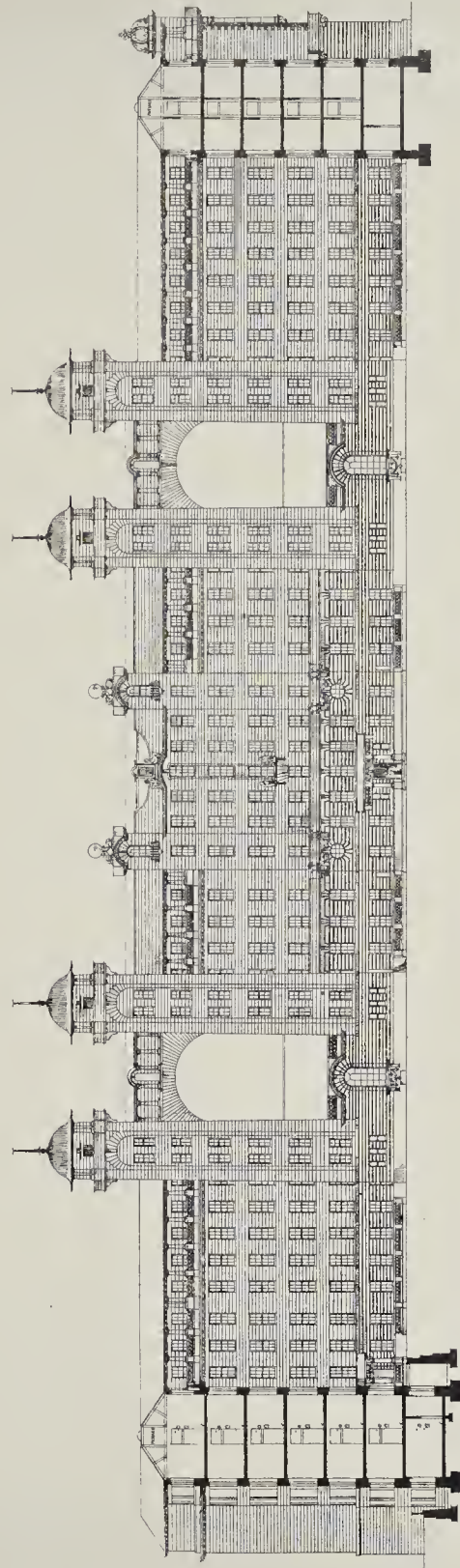
ELEVATION · TO · CASTLE · STREET





SECTIONAL · ELEVATION · TO · VICAR'S · ALLEY

Scale of measurement 1" = 10 Feet.



SECTIONAL · ELEVATION · TO · QUADRANGLE
FACING · CASTLE · STREET

Scale of measurement 1" = 10 Feet.

PHOTO. W. SPRAGUE & CO. 445 EAST HARDING STREET PETER LAKE, E.C.

GLASGOW ROYAL INFIRMARY COMPETITION: DESIGN PLACED FIRST BY THE ASSESSOR.—MR. H. E. CLIFFORD, ARCHITECT

argued here that they have no such validity as to counterbalance the grave objections that exist to interfering with an architectural surface completed by the designer in fine material and never intended by him to be touched. One motive is the very natural ambition to have a rich and sumptuous interior effect. Such an effect is in itself desirable enough, and the builder of St. Paul's might, in his architecture, have secured or prepared for it. As a matter of fact, he aimed at an effect quite different and in its way fully as noble, though not so attractive to the multitude, and is this patent and vital truth to go for nothing? People visit St. Peter's and come back to find St. Paul's cold and bare, but they do not always reflect that the two interiors are treated in essentially different manners. St. Peter's is not finished within in fine stonework, but, in parts, with veneers of costly coloured marbles from antique buildings, and also to a great extent in plaster painted. This is one way of treating a monumental interior, and Wren's is another. The difference in principle between the two is surely one that the intelligent public will be willing to recognise. The subject of "Colour as Applied to Architecture" was discussed at a meeting of the Royal Institute of British Architects in 1857, in connexion with an interesting paper by Professor Aitchison. In that discussion the late Mr. Burges took part, and said, on this very general point, that "the western and its southern systems could not go together. If we wanted colouring in a building we must give up the mouldings, or vice versa. For his own part," he added, "he would always give up the mouldings." In this case it is not a matter of choice, for the decision was made by the architect two centuries ago, and it is simply flying in the face of principles, that in their own way are as valid as if they were theological, to try now and reverse it. There are other ways of gaining a rich and sumptuous effect in the interior of St. Paul's without hacking away or polychroming Wren's stonework.

The second plausible motive referred to above may seem to have more validity. It is based on the idea that if colour is introduced anywhere in an interior, say, on the roof, it must be carried out on the other parts. At St. Paul's large portions of the roof as well as the great dome were, as we have seen, intended for decoration in colour. This has been applied in the choir in the beautiful and monumental form approved by Wren himself of mosaic. This paper is not written with the intention of criticising adversely the work demanded here, which has been carried out with such conscientious pains by Sir William Richmond. One may feel that the want of previous experience in work of the kind on a similar scale has led to over-elaboration, and that a better effect might have been produced with half the detail, but the effect of the roof of the choir is rich and pleasing, and as the choir with its stalls and its reredos possesses in the lower parts a certain sumptuousness of fittings, the decorative effect was carried out easily through the whole. So soon, however, as the decoration crept out of the choir and fastened on to the upper spaces of the piers of the dome, where, in the open area of the crossing that expands in so monumental a fashion towards transepts and nave, it was seen under quite other conditions, the attempt was at once made to "carry out" the effect of the mosaics by gilding, stencilling, lettering, and what-not on the surface of the stonework. The result of these first essays every one knows, but it may be noted in passing that the obliteration of experiments is apt to spoil the beautiful colour and patina of the stonework, which is the most precious part of the decorative effect of the interior. The one thing that seems to be needful at the present juncture is to recognise that the idea of "carrying out" the roof decoration by gilding and stencilling on the stonework below is artistically impossible, and that in consequence the walls themselves should be allowed to set the key for the whole decoration. It would be quite possible to fill the domes and spandrels with mosaic so quietly treated as to accord with the colour and texture of the walls, which, as has been urged more than once in what has gone before, are in their present condition more beautiful than we can ever hope to make them. Richness of tints is always possible in fittings and in the glass of windows, for some of the Renaissance stained glass in France is nearly as fine as Gothic. The whole difficulty is due to the prepossession that colour is always

a welcome adjunct to every kind of architectural interior. We have seen, however, that the more dignified and monumental a building is, the less need it has for any auxiliary of the kind to its stately beauty; and it would be a good thing if architectural theory could be cleared from the notion that colour is an essential element in architectural effect.

A discussion followed, in the course of which Mrs. Traquair and Mr. Scott Morton offered some criticisms on the decoration of St. Paul's as at present carried out.

ARCHITECTURAL SOCIETIES.

GLASGOW INSTITUTE OF ARCHITECTS.—A special general meeting of this Institute was held on the 21st ult., in the rooms, Pitt-street.—Mr. Alex. Petrie, vice-president, in the chair. Sympathetic reference was made to the death of Mr. John Burnet, F.R.I.B.A., ex-president, and father of the present president, which took place on the 13th ult. Mr. Burnet had reached the venerable age of eighty-seven years, and was held in the highest esteem by all who knew him. He was one of the original members of this Institute, was long a member of council, and held the office of president from 1876-1878. Lately he was on the roll of honorary members. He became a Fellow of the Royal Institute of British Architects in 1876. During Mr. Burnet's long career as an architect he and his firm of John Burnet & Son designed many important buildings in Glasgow and the West of Scotland, among others the Western Infirmary, the Stock Exchange, the Merchants' House, the head offices of the Clydesdale Bank and of the Union Bank of Scotland, Woodlands-road United Presbyterian Church, the mansion houses of Auchendennan and Arden, and Rowardennan Lodge, Loch Lomond. Mr. Burnet's relations with the Institute and his professional brethren generally were of the most cordial character, and his genial presence and wise counsel will be greatly missed. It was unanimously agreed that the Secretary be instructed to send an excerpt from this minute to Mr. Burnet's widow. The meeting then took into consideration the unanimous report of the Council regarding the Royal Infirmary competition, and a letter addressed to the chairman and managers of the infirmary, which had been prepared by them, was approved of and adopted. The Secretary was instructed to forward the letter to the chairman and managers, and to send copies to the allied Societies and to the public Press.—*Glasgow Herald.*

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—A numerously attended meeting of this Institution was held at the Westminster Palace Hotel on Friday, January 25, the chairman, Mr. Percival Marshall, presiding. Before proceeding with the business of the evening, the chairman made a feeling allusion to the great loss which the nation has just sustained, and moved the following resolution, which was passed in silence, all upstanding:—"That the members of the Institution of Junior Engineers are deeply grieved to receive the intimation of the decease of her Gracious Majesty, the universally-beloved Queen Victoria. They humbly desire to tender to his Majesty the King, and to the other members of the Royal Family, their expressions of sincere and respectful sympathy on this sorrowful occasion." The names of thirty-two members, elected since the last meeting, having been announced, Mr. Alexander Ross, M.Inst.C.E., honorary member of the Institution, proceeded to read a paper on "Railway Construction." The author stated that on a new railway being promoted the services of an engineer would be required to make a preliminary survey, to report on the route he would recommend, and to estimate the probable cost; and on these proving satisfactory, his next duty would be to proceed with the surveys, and to take such levels as would enable him to prepare the Parliamentary plans and sections, prepared well in view the requirements of the several Acts of Parliament generally incorporated with the Special Act and particularly the Land Clauses Acts of 1845 and 1863, as well as the Standing Orders of both Houses of Parliament, and the regulations and requirements of the Board of Trade. It was pointed out how very important it is that every attention should be given to the centre line being fixed so as to avoid as far as possible

expensive property and buildings, at the same time avoiding such bad curves and gradients as would limit the working capacity of the line. Consideration was then given to curves and super-elevation of the outer rail, and the limiting effect curves had on the load to be hauled, but more particularly on the speed at which trains could be run with safety, the deduction being that for a first-class trunk line of railway no curve should be of less radius than one mile, if this could be reasonably secured. This was followed by a reference to gradients, data being given and a table submitted, indicating to what a serious extent bad gradients limit the hauling capacity of the engine, it being shown that when a gradient is so heavy as to require two engines to do the work of one, it might be economical to expend more capital in securing a better inclination, bearing in mind, however, that circumstances did arise when this did not apply, as, for instance, when coal or iron ore had to be hauled from the higher lands to a dock or depot lower down, the load then being with the gradient and the empty waggons only having to be hauled up the hill. The desirability of balancing the earthwork in cuttings and embankments was referred to, and also that in ranging out the line, level crossings should be avoided, and the number of bridges, viaducts, tunnels, retaining walls, and culverts should be kept down as much as possible with the smallest sizes adopted, consistent with efficiency. Cross sections of cuttings and embankments were illustrated, the author recommending for the cutting a width of 28 ft. at the formation level for two lines of way, earthenware pipes, with cesspits 100 ft. apart, being used at the sides in lieu of side ditches; the ballast carried right across, and in this manner supporting the slopes. Other precautions that should be taken for the prevention of slips in the slopes of cuttings and embankments were noticed. In describing railway bridges the author gave the preference to brick and stone arches when these could be used, both on account of first cost and after maintenance. When the superstructure must be of steel and when headway would admit, he favoured that type where the girders are placed directly under the rails, with parapet girders at a higher level and the whole connected with flooring plates. The paper next dealt with the advantages to be derived by using a type in which two centre girders are employed, and each line of rails is carried by an independent bridge, especially when a railway is overlying coal measures where subsidence is likely to occur, as one line of rails could be lifted while the traffic is conducted over the other line. The construction of tunnels was alluded to, and the several parts forming the permanent way were described in detail, as well as the various processes in use for the preservation of timber sleepers. Special mention was made of steel rails, the author referring to the Report of the Committee appointed by the Board of Trade in May, 1896, and regretting that while recommending the standardising of rails in connexion with (1) weight, (2) section, and (3) the chemical composition, no recommendation was made as to who should undertake this most desirable duty. The concluding part of the paper was devoted to signalling, it being stated that the lock and block system was working its way slowly to the front—and also that at the present time four methods of operating the interlocking, the signals, and the points by power are being considered, viz.: the hydraulic, the electric, the pneumatic, and the electro-pneumatic. As under existing conditions each of these necessitated the provision of special power, it was thought there was not much to be gained from the point of view of economy, but the author expressed the opinion that the ultimate development of the matter would probably resolve itself into every railway station being provided with a power station, looked after by skilled attendants, not only to supply power to work the signalling appliances, but also for electric lighting, for pumping water, for working hoists, for warming and ventilating the buildings, and to meet the numerous requirements of a railway station.

WILLING'S PRESS GUIDE.—"Willing's Press Guide for 1901" (James Willing, Ltd., 125, Strand, W.C.), is the twenty-eighth annual issue of a concise and well-arranged index to the Press of the United Kingdom. The guide also contains a list of the principal colonial and foreign journals and a variety of general information relating to the Press. It is one of the best and cheapest Press guides published.

THE GLASGOW INFIRMARY COMPETITION.

THE Glasgow Institute of Architects have addressed the following letter to the Infirmary Committee in regard to the recent competition:—

"115, St. Vincent-street, Glasgow,
January 21, 1901.
To the Chairman and Managers of the Glasgow Royal Infirmary.

GENTLEMEN,—Recognising it to be your earnest desire that the Infirmary, when reconstructed, should conform to the most modern standards of design in this class of building, and that the subscribers and the general public have a right to expect this, we, the Glasgow Institute of Architects, as a body of technical experts in such matters, feel it to be our duty to state that, in our opinion, this result will not be achieved if the reconstruction is proceeded with according to the plans selected by your Sub-Committee in the recent competition.

We attribute this failure not to any lack of zeal on the part of your Committee, or of ability on the part of the competing architects, but mainly to the manner in which the competition was initiated and carried through, and that in the following respects among others:—

I. That along with the printed conditions provided for the competition there were issued two sets of sketch plans as indicative of alternative arrangements which the Sub-Committee recommended, and which were stated in the accompanying report to be drawn by, or under the direction of, two members of the Sub-Committee respectively.

II. That a Jubilee Block, to be situated on a particular part of the site, was insisted upon as an integral part of the scheme.

The results of these elements in the conditions were:—

(a) That the competitors and the assessor were hampered in the exercise of their individual judgment as to the main points of importance in such a building, viz., the distribution of the various buildings with respect to each other for convenience of working, and of all for the freest access of sun and air.

(b) That the competitors were placed in the invidious position that, in the event of the schemes recommended by the Committee not proving themselves to be in accord with their judgment and experience, they were bound, in departing from them, to meet with disfavor from those influential members of the Committee who would enter upon the examination of all the plans with minds necessarily biased in favour of those which they themselves had put forward, while reserving their position as judges.

(c) That as the result the proposal that plan E be accepted, which became the finding of the meeting, was moved by the gentleman who was actually the author of the scheme which was adopted and worked out in detail by this competitor.

III. That neither of the sketch plans issued are in accord with the present day principles of hospital design, as might indeed be expected, seeing that their authors have not enjoyed the training which would qualify them as surgical, medical, or architectural experts; that, in fact, the plans are in many vital particulars inadequate and out-of-date, and that these faults are naturally displayed equally in the selected design, which is but an elaboration of one of them. A corroboration of this assertion with regard to the radical faultiness of the plans in question is furnished by the fact that six out of the ten competing architects found it necessary in spite of risk of possible consequences already alluded to, to entirely throw over the schemes furnished to them, and that among this number are found all the four architects from outside of Glasgow (two from London and two from Edinburgh), who were presumably invited specially on account of their knowledge of hospital design.

Such being the opinion of the Institute after a very mature and careful consideration of the whole subject, we would most earnestly urge the managers, before committing themselves and the public to the erection of any portion of the building, as designed, to have the plans submitted to one or more independent hospital authorities of recognised and outstanding position for consideration and report.

Apart from the all-important question of the erection with the public funds of an entirely adequate and modern hospital, we, the Institute of Architects, feel it necessary to lodge a protest against the setting aside by the Sub-Committee, without any reason given, of the award of the professional assessor, Dr. Rowand Anderson—the more so that a simple majority of one was considered sufficient to overturn his judgment—as liable to prejudice the success alike for promoters and architects, of future competitions in Glasgow. And we have further to state, that the erection of a Jubilee block, such as is proposed, seven stories high, and in the position selected, will, if proceeded with, dwarf and irretrievably injure for all time the external appearance of the cathedral. The foregoing statements represent the unanimous finding of the Glasgow Institute of Architects, as a meeting specially called to consider a report of the Council on the question, and as the matter is not only one of the greatest public importance, but of extreme

urgency, owing to the proposal of your Sub-Committee to proceed at once with the erection of the northern block, it has been communicated to the public Press at the same time as it is submitted, with our earnest prayer for its consideration, to yourselves.

In name and on behalf of the Glasgow Institute of Architects. C. J. MACLEAN, Secretary."

THE SURVEYORS' INSTITUTION.

A MEETING was held on Monday evening at the Surveyors' Institution, Gt. George-street, Westminster, for the purpose of continuing the discussion upon Mr. R. E. Middleton's paper on "The Future of the London Water Supply."

Mr. J. Shaw, the President, said that since they last met, which was only a fortnight ago, a very great calamity had happened to the country in the death of our beloved Sovereign, Queen Victoria. In consequence of that occurrence the council had resolved that it would be most desirable that they should show their respect by adjourning this meeting. It was thought that this course would commend itself also to the members present. In addition to this, the council proposed to send a resolution to the proper quarter, to the effect that the Institution desired to express their sense of the grievous loss sustained by the death of the late Queen, their sympathy with the Royal Family, and their loyalty to King Edward. It was impossible for them yet to realise what the loss really was, but in the midst of their sorrow they could be thankful that the late Queen died so peacefully, surrounded by her family. They should also be thankful for the great example which her late Majesty had left to them in every capacity, whether as wife, mother, or Queen—an example that never could be excelled, even if it could be equalled.

The meeting was then adjourned.

Students' Preliminary Examination.

Of the candidates who presented themselves at the Preliminary Examination of the Institution, held concurrently in London, Manchester, Dublin, and Glasgow on January 16 and 17, the following satisfied the examiners:—J. T. Abrahams, Maidstone; R. S. Andrews, Oxford; O. W. Allen, London; E. R. Appin, English; C. W. Archam; F. L. Baker, Bishop's Stortford; E. G. Bayly, Berkhamstead; H. C. Beaven, Enfield, N.; R. L. J. Bedford, Acton, W.; R. H. W. Bennett, Wimbledon Park; C. E. Benton, Grimsby; C. J. Berry, Wardsworth-common; B. F. Blois, Bournemouth; L. V. Bowler, Southend; T. H. Bowler, Canterbury; H. Brown, Chichester; W. E. Brown, Chester; A. H. Butelet, St. Austell; H. Burch, Hightgate; E. C. Burgess, West Hampstead; R. H. Barstow, Hailsham; C. R. Campbell, South Kensington; W. J. Carlisle, Gloucester; J. G. Chapple, Acton, W.; A. Chard, Horverton; A. H. Clarke, Walthamstow; W. C. Clemens, Plymouth*; C. S. Cobb, Strathfieldsaye; H. Cooper, Gravesend; H. J. Culpin, Walthamstow; H. Darby, Bridlington; W. G. Davies, Newbridge; A. C. Dorrington, Lancaster; W. M. Dugdale, Goswastry, S. Edwards, Exeter; C. Egan, Farnham; R. C. G. Ellen, Andover; R. A. Ellis, Wanstead; C. S. E. Evans, Havfordwest; G. W. Ferris, Maidstone; J. A. Flatt, Wanstead; J. H. Fenning, Bedford; G. F. Finch, Hornsey Rise; A. K. Foulis, Motherwell; E. L. Frost, Anerley; H. J. Gale, Wheatley; T. M. Glasson, Aspatria; T. K. Glog, London; P. W. Gregory, Haverstock Hill; O. Greenwood, Todmorden; J. C. Grierson, Liverpool; E. M. Haes, Surbiton; V. M. Hall, Hampstead; E. C. Harris, Upper Tooting; E. T. Haslehurst, London; E. R. Hawkins, Downham Market; J. Hayward, Bath; G. S. Henderson, Kilmarnock; H. A. Hinton, Highgate; S. Hooper, Upton Manor; R. L. Honey, Rochester; J. N. Horsfield, jun., Kingston-on-Thames; E. Howard, Snaresbrook; E. E. V. Ives, North Walsham; E. C. Jarvis, Upper Tooting; S. B. Kings, Abingdon; W. H. Lambie, London; J. C. Lucas, Lewes; A. J. Lyndon, Plymouth; M. L. Lyon, London; J. E. G. McSheehy, Wimbledon; J. Matley, Oldham; E. Meacher, Salisbury; C. McC. Myott, Cambridge; J. S. Naylor, Beckenham; A. O. Nonkes, Willesden Green; O. T. Nettleton, Kensington; H. B. Owen, Newcastle, Stairs; J. O. Payne, Bromley; C. F. Peile, North Finchley; G. L. Pepler, Croydon; A. P. Beckers-gill, Putney Hill, S.W.; E. T. F. Pope, Margate; P. H. Ross, Holloway; T. Rule, Aspatria; A. Salvey, Broxbourne; W. S. V. Sansom, Colchester; T. E. Scammell, Redland, Bristol; J. J. Shardlow, Leicester; A. J. Shield, Liverpool; F. M. Skelt, Leytonstone; S. W. Smith, Cheshunt; W. B. Smith, Hincley; C. T. Steward, London; N. D. Stewart, Dunston, Salisbury; T. Tyndale, Stoke Newington; C. W. Tansworth, Aldridge; A. A. Vigers, Walton-on-Thames; P. D. Voisey, Exeter; I. Wall, Huddersfield; S. J. Walter, New Wanstead, E.; J. A. H. Wells, Ashby-de-la-Zouch; A. V. White, Portsmouth; H. W. Whitton,

* Bracketed equal for head of List.

Caswell, near Towcester; W. O. Wightman, South-Croydon; H. W. Wilkinson, Winchmore Hill; E. Williams, Croydon; H. Wood, Grimsby; E. E. Woodbridge, Harrow-on-the-Hill; J. P. Woodhams, Hastings; B. Worral, Whalley Range, Manchester; H. O. Young, Rock Ferry, Cheshire.

THE LONDON COUNTY COUNCIL.

A SPECIAL meeting of this Council was held on Tuesday afternoon in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding, when it was agreed that an address of condolence in the affliction of the King, and of congratulation upon his accession to the throne, be presented to his Majesty the King.

The ordinary weekly meeting was then held.

Loans.—The Finance Committee recommended, and it was agreed, to lend Battersea Borough Council 4,795*l.* for building a coroner's court and mortuary; the Shoreditch Borough Council 2,430*l.* for a street improvement; the Woolwich Borough Council 6,500*l.* for stables and underground conveniences; and the St. Pancras Guardians 2,600*l.* for works at the infirmary.

New Statistical Officer.—On the recommendation of the General Purposes Committee, Mr. E. J. Harper, assistant valuer, was appointed statistical officer, in place of Mr. Gomme, promoted to be Clerk of the Council, in succession to Mr. Stewart.

Spitalfields Market.—In view of the Bill which the Council is promoting for the acquisition of Spitalfields Market, a provisional agreement with the freeholders, putting the price at 176,750*l.*, was approved.

The Port of London.—The Rivers Committee, in the course of a long report, recommended the Council to pass the following resolutions:—

"That the Council authorises the Rivers Committee to arrange for evidence to be given before the Royal Commission on the following lines:—

That the management of the Port of London and the docks of the London and India, the Millwall and Surrey Commercial Docks Companies should be consolidated in the hands of one public authority.

That the port should for all purposes be defined as extending from the tidal limit of the Thames at Teddington on the west to an imaginary line drawn from the Naze to the North Foreland, subject only to provisions similar to those in the Thames Conservancy Act, 1894 (Section 3) and the second schedule) with regard to charging shipping dues.

That the management and administration of the port and docks should be in the hands of a Statutory Authority, to be called the 'Port of London Committee,' subject to the Council retaining the control of capital expenditure.

That power should be conferred on the Council to purchase the property of the dock companies, and to raise the capital necessary for that purpose for deepening of the channel of the river, and the improvement of the port and docks.

That the Port of London Committee should be constituted on the general principle of one-third representation of the Council, one-third of ship-owners and merchants, and one-third of the City and official members.

That in view of the national interest in the Port of London the Government be invited to contribute towards the expense of improving the port.

That repayment of capital should be provided for by instalments spread over 100 years, on the annuity system."

These recommendations were agreed to, after discussion, practically unanimously.

Easton-road Fire Station.—The Fire Brigade Committee recommended, and it was agreed, that the estimate of 15,200*l.* to be submitted by the Finance Committee in respect of the erection of the proposed Easton-road station be approved, and that tenders be invited by public advertisement for the work.

Housing of Caledonian Asylum Site, Holloway.—The Housing of the Working Classes Committee recommended, and it was agreed, that the estimate of 16,500*l.* submitted by the Finance Committee be approved, and that the Council do acquire, under Part III. of the Housing of the Working Classes Act, 1890, the Caledonian Asylum and the site thereof, subject to the sanction of the Charity Commissioners, and subject to a provisional agreement embodying the conditions set out in the Committee's report.

Tower Bridge Southern Approach.—On the recommendation of the Improvements Committee, it was agreed—

(a) That the working-drawings, specification, and estimate of the cost (21,500*l.*) of the paving and other works in connexion with the portion of the

new Tower Bridge southern approach between Purbrook-street and Artillery-street be referred to the Manager of the Works Department, with a view to the work being carried out without the intervention of a contractor.

(b) That the Improvements Committee be authorised to engage, at the weekly wages of 3*l.* 13*s.* 6*d.*, a clerk of works in connexion with the portion of the new Tower Bridge southern approach between Purbrook-street and Artillery-street.

Westminster Improvement.—The Improvements Committee recommended, and it was agreed—

That the estimate of 1,315,000*l.* (in substitution for the capital vote of 51,443*l.* which was approved by the Council on November 6, 1900), submitted by the Finance Committee in respect of the Thames Embankment extension and Westminster improvements at Millbank be approved, and that as the Council of the City of Westminster had undertaken to make the necessary contribution of 100,000*l.*, the Improvements Committee be authorised to incur expenditure on capital account up to 1,315,000*l.* for the purpose of the improvements in question.

Theatres, &c.—The Theatres and Music-halls Committee recommended that the following applications be agreed to:—

Alterations to gallery, Euston Theatre of Varieties (Messrs. Wylson & Long).

Gallery steppings at the Grand Theatre, Islington (Mr. F. Matcham).

Quadrant Restaurant, London Exhibitions (Mr. A. O. Collard).

Deviations from plans of St. Pancras Public Baths (Mr. T. W. Aldwinckle).

The recommendations were agreed to, and the Council, having transacted other business, adjourned.

THE LONDON BUILDING ACT, 1894:
THE L.C.C. AND BUILDING LINES.
TRIBUNAL OF APPEAL CASE.

A SITTING of the Tribunal of Appeal under the London Building Act, 1894, was held on Friday last week at the Surveyors' Institution, Great George-street, Westminster, to hear the appeal made by Mr. James Ellis against the certificate of the Superintending Architect of the London County Council defining the general line of buildings on the south side of Woolwich-road, Greenwich, between the house known as No. 430 in that road and the street known as Ransom-road. The certificate referred to was issued under Sections 22 and 29 of the London Building Act, and the plan to which it referred—the one approved by the Superintending Architect—showed the building line to cut through a projecting house owned by Mr. Ellis. It was against this that Mr. Ellis appealed. The members of the Tribunal present were Mr. Arthur Cates (Chairman), Mr. Penfold, and Mr. Hudson. Mr. Ellis conducted his own case, and Mr. Dalbie, barrister (instructed by Mr. Andrew), represented the County Council.

At the outset of the hearing a question arose as to whether the Superintending Architect against whose certificate the appeal was made should be in attendance. Mr. Ellis maintained that as that gentleman was in the position of defendant, his attendance was necessary. In the certificate which he had issued he made certain statements which he ought to be there to substantiate, and he (Mr. Ellis) in turn was there to defend himself against the Superintending Architect.

After consultation, Mr. Hudson said the Tribunal had asked him to express their view of the position held by the Superintending Architect with regard to the present application. Their opinion was that that official was an independent officer. Before certain persons could do anything under the Building Act it was necessary that they should first of all obtain his certificate. If any dispute arose as the result of the provisions of the certificate, any of the parties concerned could, if they pleased, subpoena the Superintending Architect as a witness to be cross-examined by both sides, but they must take the risk of doing so.

The Chairman expressed the further opinion that the Tribunal was limited under Section 183 of the Act to require the production of documents or books, and to hear and receive evidence.

Mr. Dalbie pointed out that there was nothing in the Act, so far as he was aware, about the power of the Tribunal to call witnesses. Mr. Ellis asked if the more dignified course for the County Council to follow would not be to ask the attendance of their Superintending Architect. He was there in the interests of fairness, and he did not think his request an unreasonable one.

The Chairman: The case, then, must be left in this position, that you may request the attendance of the Superintending Architect.

Mr. Ellis: I do request it, but, unfortunately, he is not here. He has made an accusation and made a certain statement, and he is bound to be here to defend that statement.

The Chairman: The practice has been for the Superintending Architect not to be here.

Mr. Ellis: Perhaps not, in many cases, but in this case I wish to put him in the box as my witness.

I am going to prove that he has attached to the plan a line that was not attached on the day when he met the parties, and that he altered his plan after he left the parties. I am also going to show that once a decision has been arrived at by a public body it cannot be altered.

The Chairman: You have not given the Superintending Architect any notice asking him to be present.

Mr. Ellis: I have written the Solicitor of the County Council stating that the plan attached to the certificate is a false one. I have not made a formal request for him to be in attendance.

The Chairman: It is to him you must communicate your desire that he should attend. If he in response to that, declines to attend, it is for you to consider what steps you shall take to enforce his attendance.

Mr. Ellis: Unless he attends to-day the invalidity of his plan and certificate shall be established. It was for the counsel of the County Council honourably to call for the attendance of the Superintending Architect.

Mr. Hudson: They decline to do so, and leave you to prove your case.

Mr. Ellis: There being no defendant present, I have obviously no one to fight.

Mr. Hudson: Then that is to your advantage, but you must prove your case.

Mr. Ellis: Then I am prepared to proceed.

The case was then proceeded with, Mr. Ellis opening his appeal by handing in a copy of the correspondence that had passed between him and the Solicitors of the County Council, adding that copies had been sent to the Solicitor of the Council and also to members of the Tribunal. His objection to the plan annexed to the certificate was, he added, that the line of building therein marked by the Superintending Architect was not the one marked by him in the presence of the parties who attended the meeting held in December.

At this point the plan referred to was produced, and Mr. Ellis, after inspecting it, agreed that it was the one submitted to the parties with a certain pencilling made by the Superintending Architect deleted. The line which there appeared was not the one made by the Superintending Architect in the presence of the parties concerned. He had on two occasions subsequent to the meeting pointed out to that official the absurdity of making a building line which cut directly through a house that was more than a hundred years old. It was impossible, of course, for him to say whether the particular piece of linen submitted to the Tribunal was the one which was marked by the Superintending Architect in the presence of the parties.

Mr. Andrew (the Council's Solicitor) stated that an assistant in the County Council's office who was present at the meeting was in attendance, and he would prove the plan to be the identical one submitted on that occasion.

Mr. Ellis submitted that the plan, having been approved by the Council, could not be altered, and in proof of this contention quoted the case of *Slack v. the Mayor of Bradford* (8 *Law Times* (New Series), p. 401). In this case, he said, it was held that when a Town Council had approved a plan they had no right afterwards to alter the line of frontage.

The Chairman remarked that this was very good law, but he could not see that the approval by the Superintending Architect should be held as equivalent to approval by the County Council.

Mr. Ellis: Surely he is the representative of the County Council, and the Council is responsible for him?

The Chairman: No, he is not. He does not arrive at his certificate until he makes inquiries and decides as to what form his certificate will take. It is the final certificate, and that alone, we have to deal with. What transpired previously is quite beyond us.

Mr. Ellis: Passing over that, then, I have to submit that my application of October 4 was not made under Section 22. It was an intimation to the County Council that for the sake of peace I was willing to give up land, 48 ft. in length and 9 ft. in breadth, to widen the Woolwich-road, which is extremely narrow and dangerous at that point. I gave up that land voluntarily and without prejudice, and, as you will observe from the correspondence, I reserved my right to disregard the Council's pleasure or refusal. I wished to meet the Council for once by making the offer. I did. The Council did not accept; neither did they refuse it. Three weeks passed, and then I was asked to send in a fresh plan, as nothing had been done with my application—if application it can be called—and I did so. Subsequently the remark was made that the architect might be asked to define the line of building in Woolwich-road, and then I stated that this would not affect my line of building.

The Chairman asked if there was any plan lodged on October 4, as there was nothing referring to it in Mr. Ellis's letter to the Council of that date.

Mr. Ellis replied that there was.

Mr. Dalbie remarked that Mr. Ellis was entitled to assume that consent was given to his proposal. Under Section 27 there was the express provision that "the consent given by the Council shall not affect the building line." Assuming that he had the consent, I cannot see that it would help him, having regard to Section 27.

Mr. Ellis: You are misconstruing that Section.

If the Council gave consent to No. 498 to bring out his house, No. 496, next door, could not assume that he also had a right to do so. The reading of the Section is this, that providing the County Council do give consent for a particular person to bring out his property, it shall not bind them to assent to the people next door doing the same. Madame Tussaud's, in Marylebone-road, is a case in point. Continuing, Mr. Ellis said that his next points were that his application of November 15 was made at the request of the Council's Solicitor and Superintending Architect, and in no way barred his first application of October 4, and that his offer to give up a strip of land 9 ft. broad was gratuitous, he being only bound by Section 13 of the Act to keep 20 ft. distant from the centre of the road. He further maintained that as Ransom-road, which runs through Woolwich-road, broke the building line, as was proved by its absence from the plans of the Superintending Architect, owners of property beyond were not entitled to be heard in this case. His next point was that the Local Authority of the district had no *locus standi* as his building was not within the prescribed distance from the centre of the road, and that the works consisted of extensions only and consisted of one and the same building. The material point in this case was that Section 22 of the Act did not apply to his application, for that section only applied to where a building was erected within the prescribed distance, for if it was the County Council could take action.

Mr. Hudson remarked that his understanding was that the appeal was made under Section 25 of the Act, and it seemed to him as if Mr. Ellis was wandering about all sorts of sections. The appeal was against a certificate of the Superintending Architect defining the general line of buildings. He understood Mr. Ellis to have made a proposition without regard to Section 22, that the Council declined it, and that, as a consequence, it was abortive. Mr. Ellis replied that his offer to the Council came to an end. The Superintending Architect in fixing the building line, ran his head against a wall that was more than a hundred years old. Having failed to make a hole in it he attempted to cut through it, as was marked in the plan. Now, the Act contained provision respecting the prolongation of a building line, but whoever heard of the prolongation of a line being severed by 20 ft.?

Mr. Hudson pointed out that in his application of October 4, Mr. Ellis applied for leave to erect two domestic dwellings to be used as shops and dwellings. He asked the appellant to consider how these could be described as one building.

Mr. Ellis replied that he was putting iron doors to join the buildings. He said it was outside the power of the London County Council to restrain any one from building if he was 20 ft. from the centre of the road if there was no line at the point, and it was an extension of an existing building as was the case in his instance.

Mr. Ellis afterwards entered the witness-box and gave evidence, as did Mr. Harry Snywood, the appellant's foreman; Mr. Walter Spier, the District Surveyor; and Mr. W. T. Perkins, an assistant in the office of the Superintending Architect of the London County Council.

Mr. Dalbie, for the County Council, contended that they might have a general line of building even with one or even two buildings projecting over it, and this was the position of the building at 494, Woolwich-road. He submitted that this property should not be left out in the way suggested. If it were, it should not form a precedent for bringing out the two adjoining houses. As the matter stood at present the only obstacle to getting a proper building line for that part of Woolwich-road was No. 494, and if Mr. Ellis pulled that property down with the intention of rebuilding it, the Local Authority would have the opportunity of having it set back to the general building line by paying compensation.

Mr. Ellis repeated his contention that so long as he was kept out with the prescribed distance from the centre of the road he required no consent from the County Council or any one else to build. They had no power whatever to interfere with the property at 494, Woolwich-road, and he could carry it along to the point where he had offered to concede land to the County Council of the value of a thousand pounds. His offer stood open to the Council to accept because he had full sympathy with the community, and desired to see the road at that point widened.

The Chairman remarked that the Superintending Architect could not have intended to conceal anything, as he went to the spot and used his own judgment. Any attempt such as Mr. Ellis suggested would, therefore, have been vain and futile, and he could not put the intelligence of the Superintending Architect at such a low standard as to imagine that by putting forward any plan he could hope to deceive the Tribunal.

Mr. Ellis: I hold that I have a substantial grievance in the refusal of the Council to produce the Superintending Architect to-day.

The Chairman: You should have taken steps to ensure his attendance.

After some further observations the chairman intimated that the Tribunal would consider all the points raised, and issue their decision in due course.

Illustrations.

GLASGOW ROYAL INFIRMARY RECONSTRUCTION.

WE give this week full illustrations of the design for rebuilding the Glasgow Royal Infirmary, by Mr. H. E. Clifford, of Glasgow, to which the assessor, Dr. Rowand Anderson, awarded the first premium, and which, it would appear, ought to be the one to be carried out, though the committee, apparently, have chosen to throw it over.

The following extracts from the architect's descriptive memorandum, sent in with the design, will serve to explain the drawings:—

Block Plan.—In arranging the position of the various blocks on the site, scheme No. 5 has in a large measure been adhered to. It provides the greatest possible amount of free space between the infirmary buildings and the high tenements on the west side of Castle-street, while to the east of the infirmary buildings there is ample free space. The open roof quadrangle gives convenient access to each block.

It is proposed to erect the north part of block A (which stands clear of the present buildings), before taking down any of the present buildings. This is suggested with a view to maintaining the existing accommodation as far as possible throughout the entire reconstruction. The Pathological Institute remains in its present position, and will require at some future time to be rebuilt. Any attempt to alter the existing building is felt to be a mistake. The present laundry block, being considered sufficient, is not interfered with. Additional boilers are erected at the west end of laundry block to provide steam for the hot water supply to the infirmary buildings, and for warming fresh air in ducts to wards, &c. The chapel is placed at end of conservatory corridor, near west end of nurses' home. The nurses' home can be added to at east end.

Superintendent's House.—The house would be erected on ground at east end of site.

Basement Floor.—Owing to the levels of the site, this floor extends only under blocks A and C. Besides access by stairs from ground floor, there is an entrance from Vicar's-alley for stores, &c. A corridor is arranged from basement of block A to present mortuary and new boiler house. The accommodation on this floor is:—

1. General stores, with lift direct to kitchen on top floor.
 2. Linen and sewing-room.
 3. Mattress and mattress-work-room.
 4. Dorcas, dressmaking, and patients' clothes.
 5. Turkish bath.
 6. Electrical department.
 7. Gymnasium.
 8. Surgical services.
- One ward (spare), fifteen beds at 1,500 cubic feet per bed.
 One side ward (spare), four beds at 1,760 cubic feet per bed.
 One side room (spare), one bed at 1,838 cubic feet per bed.

Ground Floor.—Although an entrance is shown at front of Cathedral-square block, the working entrance to the infirmary is from Castle-street. A gatehouse with emergency wards is placed at west end of block B, and adjoining working entrance. The porter is also here. Accommodation on this floor is:—

- Block A.**—One complete surgical service.
 Three wards, forty-three beds at 1,550 cubic feet per bed.
 One side ward (female), four beds at 1,760 cubic feet per bed.
Block C.—Administrative.
Block B.—Administrative and emergency wards at Gatehouse.
 Two wards, eleven beds at 2,002 cubic feet per bed.
Block D.—Isolation.
 Five wards, twenty-seven beds at 1,550 cubic feet per bed.

The other stories follow much the same general arrangement, so that we need not continue the schedule further, except in regard to—

Sixth Floor (over Block C only).—Contains kitchen, &c., and storage accommodation supplied from general stores in basement. The kitchen is in centre of Block C, and a service passage is arranged on same level in roof over Blocks A and B, giving a direct service for food by trolleys to the hoists of Blocks A and B.

Abstract of Accommodation.			
	Male.	Female.	Spare.
Block A	179	120	20
" B	43	59	11
" C	137	109	—
" D	16	11	—
	375	299	31

Style of Architecture.—The English Renaissance has been considered the most suitable style from every point of view, and in order to emphasise the Diamond Jubilee, royal crowns have been introduced on the Cathedral-square façade, and the equestrian statues flanking the entrance could be those of the Queen and Prince Consort.

Materials and Construction.—The foundation would be concrete, and the outside walls of free-stone. The stone for external face to be from Lochbarriggs Quarry, Dumfries, all angle tested. The principal division walls would be brick, and the remainder of fireproof 'Fram' construction. The roofs would be slated with large-size pale green slates. The central dome and sanitary turrets covered with copper.

The floors would be fireproof, composed of steel girders, steel beams, and 'Fram' arch-blocks, finished on ceilings with 'Fram' boards coated with Adamantine polished plaster. The floors of wards, sanitary turrets, corridors, operating theatres, kitchen department, and all basement would be laid with 'Terrazzo' (see Paisley Infirmary and many Continental hospitals), and the floors of other apartments would be laid with pitch pine flooring, nailed direct on to 'Fram' blocks.

The interior of stone walls would have metal straps and expanded metal lathing, finished with Adamantine polished plaster. The lower part of wards and corridors, and all the kitchen walls to be covered with crystalline tiles of large size (the joints of these tiles are so close no lodgement is afforded for dust), and the operating theatres to have walls and ceilings entirely covered with these tiles, so that they may be thoroughly steamed.

All floors, walls, and ceilings to have corners rounded.

Heating and Ventilation.—It is proposed to adopt the 'Plenum' system as perfected by Mr. William Key, and so successfully carried out by him in Paisley Infirmary. It is impossible to give an adequate representation of his methods on plans, but his system is now so perfect that, with telephonic communication from every part of the building to the engineer, the temperature and volume can be regulated to a nicety at any point. The air of the wards is changed ten times an hour during winter, and up to fourteen times an hour during warm weather. Steam boilers for air warming are placed at end of laundry block.

Hot Water Supply.—The arrangements for this supply throughout the blocks are:—The utilising of steam from boilers of heating apparatus, supplying steam by pipes carried along in a duct outside of the buildings, and into copper water-heaters and hot water stock tank combined, placed in basement of each sanitary turret, from which an instant hot water supply is available at any point on the various floors.

The probable cost is estimated at 258,000l.

INTERIOR VIEW OF ST. PETER'S.

This view of the interior of St. Peter's is placed among our illustrations this week in connexion with Professor Aitchison's Royal Academy lecture. We have other illustrations to give with the succeeding lectures.

PROPOSED NEW WATER REGULATIONS.

The following remarks on the subject of water-closet flushing cisterns, included by Dr. Orme Dudfield, the Medical Officer of Health to the Borough of Kensington, in his last four-weekly Report, may be read with advantage at present. The italics in one or two passages are our own:—

Information on the subject, and some useful criticisms, will be found in a report by the Electric, Gas, and Water Committee of the Borough Council of Paddington, lately communicated to the other Metropolitan Borough Councils. One or two points not emphasised in that document seem to call for notice. And firstly, it would appear, by implication at any rate, that regulations 32 and 34 might have the effect of preventing, in future, the construction of pan and valve closets, as it is proposed that every water-closet shall be supplied through a flushing cistern or service box so constructed so as to 'prevent the discharge of more than two gallons of water at each flush, or a continuous flow of water,' i.e., by raising the lever or handle attached to pan and valve closets, which cannot be properly cleansed through a flushing cistern or service box. The object aimed at is economy in the use of water—a commendable object, if compatible with efficiency for cleansing the basin and trap of the closet. The proposed quantity of water—not more than two gallons at each flush, the quantity discharged often not exceeding one-and-half gallons—is inadequate for the purpose. Flushing cisterns are usually fed through a pipe of small dimensions and do not refill fast enough to enable the user of the closet to remain long enough to apply a second flush. Were it the custom to feed the flushing cistern with a large bore pipe, the question of capacity of the said cis-

tern would be of less moment; for then the person using the closet might follow the practice which, at the inquiry by the Local Government Board in 1895, the learned counsel for the Water Companies said he adopted, when necessary, viz., to use a second flush—thereby giving the case away; the obvious purpose of the regulation, limiting the quantity of water to two gallons at each flush, being to prevent the discharge of more than that amount at each use of the closet. The late vestry strongly advocated the adoption of the three-gallon cistern, and a very great many such cisterns have been fixed in this borough, the companies having raised no objection. The County Council, partly at the instance of the vestry, brought about the afore-mentioned inquiry, which resulted in the inspector appointed to hold the inquiry, deciding in favour of the continuance of the limitation to a two-gallon flush. Under the instructions of the vestry, the Council's surveyor and myself had a conference with the directors of the Chelsea Water Company in 1896, the Company's officers having in that year exhibited much activity in preventing the use of three-gallon tanks in their district. It was frankly admitted that the Company did not object to the use of such tanks on the score of local deficiency of supply, but only as an act of loyalty to the companies (acting with solidarity through a committee of the chairmen), and on account of the difficulties experienced at the time in connexion with the supply of large areas, especially in the eastern parts of London. The directors appeared to be surprised when told that a literal enforcement of the existing regulation, and the supply of closets through flushing cisterns only, would entail the abolition of valve closets, a statement confirmed by their own engineer present on the occasion.

COMPETITIONS.

SWANSEA HARBOUR OFFICES.—On the 24th ult. the report of the adjudicator on the Swansea Harbour Offices plan competition was submitted to the executive of the Swansea Harbour Trust. There were ninety-seven sets of plans sent in, and those of Mr. E. Seward, Cardiff, were adjudged to be the best, and he obtained the first premium of 100l. Messrs. Fairhurst & Thornley, Blackburn, secured the second premium of 50l. The adjudicator was Mr. W. M. Fawcett, of Cambridge.

NEW INFIRMARY, BRISTOL.—The competition for a new infirmary to accommodate 1,000 beds has now been settled. The committee of the Guardians dealing with the matter have considered the award of the assessor, and find that the three designs considered by him to be entitled to rank as the best and to be awarded the premiums are—1. Mr. H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-square, London; 2. Messrs. Giles, Gough, & Trollope, of 28, Craven-street, Charing Cross; 3. Mr. Arthur Marshall, A.R.I.B.A., of Nottingham.

EARTHWORKS AND CASTLES OF EARLY ENGLAND.

This was the title of an illustrated lecture given by Mr. Elliot Malden at the London Institution on Monday. In his opening remarks the lecturer said there were many different ways in which history had been approached in these later ages, but none had been more conspicuously successful than in the study of past times through their material remains. Such remains have a special advantage over written work, for, as the late Professor Freeman pointed out, the writers of original documents not only might sometimes be mistaken, but might sometimes be liars. Material remains, at all events, were genuine, though they might not always be read correctly by us. Among the remains which past ages had left in England, fortifications, fortified houses, military posts and camps of refuge, were very numerous and sometimes very remarkable. It was remarkable, too, that they had been so much overlooked or only casually studied. Ecclesiastical architecture was much more generally known to the man in the street than was military architecture. Most people could tell whether a church was Norman, Decorated, or Perpendicular, though they might not be able to go into detail; but an ordinary person had not the slightest notion whether the Tower of London or Arundel Castle or the Round Tower of Windsor was likely to be the older, and had not the slightest notion why the Round

Tower was round or the Tower of London square. There were two great uses for the military works of the past; they were either erected to shelter a considerable number of people and their flocks and herds, or they were erected for purely military reasons, for the command of the country. Posts on the top of a hill commanded distant views, but that did not give the command of the country, which could only be obtained by means of a garrison. The country could only be commanded by occupying the passes, fords, and bridges, and at such places camps were constructed. For sheltering non-combatants the top of a hill was a suitable place, and the primitive fortifications of our ancestors were on the tops of hills, by fords, passes, and rivers. The Roman camp was rectangular in form, while that of the ancient Briton was irregular in shape, following the contour of the ground on which it happened to lie. Ancient British camps were surrounded sometimes by two, sometimes by three, banks and ditches, and in rare cases by four; the Roman camps by one wall and ditch. The British camps were larger than the Roman, as they were meant to include a large number of people and cattle, and a British camp near Dorking covered an area of eleven acres. The camps were not permanent habitations, and no doubt the people had permanent villages near; nor were they constructed to stand long sieges, as nine out of ten had no water in them. The ancient British shelter camp, if untouched by subsequent occupants, was now a simple grass-covered hill, with banks and ditches covered by brush-wood, but the Roman stations had in many cases been turned into permanent fortresses with walls round them. It was marvellous what the ancient Britons did with their primitive implements! The remains of many different periods were found in these camps, and as flint implements and primitive stone implements, were found in considerable quantities, it was safe to conclude that primitive people occupied the camps for a considerable time and in considerable numbers. Old Sarum, Salisbury, was a striking instance of a primitive fortification held through subsequent ages until the time when the site of the city of Salisbury was transferred to where it now stands. After the Romans left, it was clear that the native inhabitants, having learnt something from the Roman engineers, were in the habit of making their camps rectangular in form, while keeping their primitive form of embankments to some extent. With the West Saxons came the building of burhs, places of shelter for a small community, which were common to Scandinavian and Low German nations. The burh consisted of a mound surrounded by an earth wall protected by wooden palisading, and with a house in the middle. Castles of masonry were much later erections. Prior to the time of William the Conqueror similar castles were erected in a few days or weeks, while, of course, castles of stone would have taken much longer to erect. But with the Normans came elaborate fortifications of stone, built more or less on primitive lines, the Normans enclosing the old British mound with a circular wall. There were several examples of this period, among them being Arundel Castle, Sussex, where a castle, in one form or another, existed from the time of King Alfred; Cardiff, Lewes, Rochester, and Rochester. With all their apparent skill in building, the Normans were not always skilful architects, and they built massively because they did not build well. The best known example of a Norman keep was at the Tower of London, though there was a great deal more than the keep, which had been badly dealt with by restorers. Inigo Jones put some big windows in it, for instance, which certainly did not belong to the original structure. Guildford Castle was a curious example of a Norman square tower erected on an artificial mound, and it was one of three such examples he knew of. The lecturer then referred to concentric fortifications—walls flanked by circular or semi-circular towers. While the Norman keep was a difficult place to capture, it was difficult to escape from it, and a very few soldiers could prevent the escape of the occupants; but a large force was required to blockade a concentric castle, and such a force always ran the risk of starving itself as well as the people blockaded. Concentric castles were, therefore, strong against active attack and strong against blockade. Residential castles were a very different type, and were erected

when fortified places were not much in demand and when it was considered fashionable to live in castles. One interesting point about castles was the way in which they were turned to account by different occupants at different periods. At Bramber Castle, Sussex, there were within the same area remains of the ancient British mound; there was enough to show that the Romans occupied the place; there was the Early English mound with its fortifications of earth and wooden palisading, and then there was the Norman stone keep. The Tower of London was also used for varying purposes at different times.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lambeth North.—That the Council do make an order as follows—Whereas Mr. E. Andrews, of the Engineer's office, Waterloo Station, London, on August 21, 1900, under the provisions of Sections 13, 41, and 42 of the London Building Act, 1894, delivered on behalf of the London and South-Western Railway Company, at the County Hall, plans of four blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site between Boniface-street, and Lambeth Upper Marsh, Lambeth, and of a block of intended dwelling-houses, to be inhabited by persons of the working-class, proposed to be erected on the north side of Lambeth Upper Marsh, with an irregular open space at the rear, and the boundary fences of the site at less than the prescribed distance from the centres of Lambeth Upper Marsh and Boniface-street. . . . and whereas Mr. E. Andrews has since submitted an amended block plan (signed by the Chairman of the Building Act Committee) showing the boundary fence in Boniface-street set back the prescribed distance from the centre of that street . . . the Council does by this order sanction the said plans. . . .—Agreed.

Lines of Frontage.

Brixton.—Dwelling-houses on the eastern side of Coldharbour-lane, Brixton, at the corner of Vaughan-road, and the erection of houses on the eastern side of Vaughan-road (Messrs. Shoebridge & Kising for Mr. J. Pearman).—Consent.

St. George, Hanover-square.—A shop front, with projecting cornice and stall-front, to premises on the south side of Oxford-street at the north-east corner of New Bond-street (Mr. W. J. Almond for Mr. S. L. Stacey).—Consent.

Marylebone, West.—A wood, glass, and brick corridor in front of No. 33, Hamilton-terrace, St. John's-wood (Mr. T. B. Baldwin for Mrs. E. Wilkinson).—Refused.

Line of Frontage and Width of Way.

Lambeth, North.—An office building with projecting bay-windows at No. 45, Belvedere-road, Lambeth (Mr. R. G. Booth for Mr. C. Braby).—Consent.

Line of Frontage and Construction.

Hammersmith.—That Mr. T. Athey be informed that the Council is not prepared to accede to his request, on behalf of Mr. G. Tobutt, for permission to retain a wood and canvas fruit stall on the forecourt of No. 46, Uxbridge-road, Shepherd's Bush.—Agreed.

Width of Way and Construction.

Hampstead.—That Messrs. J. Sloper & Co. be informed that the Council is not prepared to accede to their request for permission to retain three wood and iron sheds adjoining the Tower Royal Works, Blackburne-road, Hampstead.—Agreed.

Mill End.—A temporary brick and iron church at the rear of No. 381, Mill End-road, Mill End, at less than the prescribed distance from the centre of Lawton-road (Mr. F. A. Walters for the Rev. W. Donlevy).—Refused.

Width of Way and Construction of Gangway.

Hammersmith.—An iron gangway, across the footpath known as Upper Mall, Chiswick, and with the fence in front of the northern buttress of the gangway at less than the prescribed distance from the centre of the footpath (Mr. M. W. Hervey for the West Middlesex Water Company).—Consent.

Formation of Streets.

Whitechapel and Bethnal-green, South-West.—That an order be issued to Messrs. W. Bradford & Sons, sanctioning, under the provisions of Section 10 of the London Building Act, 1894, the widening of Brady-street, Bath-street, and Foster-street, Bethnal-green, and the widening and adaptation for carriage traffic of Thomas-passage (for Messrs. Mann, Crossman & Paulin).—Consent.

Woolwich.—That an order be issued to Mr. W. Egerton, refusing to sanction the formation or laying out of a new street for carriage traffic out of Swingate-lane, Plumstead (for the Kent and Suburban Estates Company, Limited).—Agreed.

Working-class Dwellings.

Bow and Bromley.—Variations from the plans sanctioned by the Council on February 27, 1900, for the erection of a laundry and a block of three intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a plot of land on the east side of Wellington-road, Bow-road, Bow, so far as relates to certain alterations and additions to such laundry (Mr. C. A. Brereton for the White-chapel and Bow Railway Company).—Consent.

Means of Escape from the Top of High Buildings.

Holborn.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the seventh and eighth stories of a block of residential flats known as Russell Priory, on the east side of Southampton-row (the upper surfaces of the floors of which stories are above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. G. D. Martin for Mr. T. H. Brookfield-Hitching).—Consent.

Buildings for the Supply of Electricity.

Holborn.—An electric sub-station, transformer-room and storage battery-room on the south-west side of Tower-street, Little Earl-street, Holborn (The Metropolitan Electric Supply Company, Limited).—Consent.

City of London.—A distributing station on a site at the rear of Nos. 82 to 84, Fenchurch-street, City, to abut upon Carlisle-avenue (Messrs. Clifton, Son, & Hope, for the Charing Cross and City Electric Company, Limited).—Consent.

Height of Buildings.

Hammersmith.—That the application of Mr. C. G. Miller for an extension of the period within which the re-erection of the Swan public-house, No. 40, Broadway, Hammersmith, with a portion of the new building to abut upon Beadon-road and to exceed in height the distance of the wall of such building from the opposite side of that road, was required to be commenced, be granted.—Agreed.

Construction of a Cabmen's Shelter on the Victoria Embankment.

Strand.—A cabmen's shelter on the Victoria Embankment, near Savoy-street, Strand (Mr. T. S. Stahlschmidt for the Committee of the Cabmen's Shelter Fund).—Consent.

TECHNICAL EDUCATION IN GALICIAN AUSTRIA.

MR. JAMES BAKER, F.R.G.S., whose reports to the Board of Education on technical education in Berlin and Fosen were noticed in the *Builder* of January 4, has also written a description of the technical and commercial schools in Galician Austria. He tells us that in Cracow, which is a town of 83,000 inhabitants, there are for technical education the Staats-gewerbe School, with 204 scholars; the Fortbildungsschule, with 140 pupils; a locomotive school, with forty-nine; an art school, and five town continuation schools, with 800 pupils; also a Handel, or commercial school, with 160 pupils. The cost of the building for the Gewerbeschule, which was built in 1898, was about 5,000. The apprentices of the town are compelled to go to the continuation or Fortbildung schools, and in the Gewerbe or trades schools poor scholars are assisted by thirteen State scholarships of 150 gulden (12l. each), and ten provincial and four private scholarships of the same amount; and, besides, there is a yearly sum of 350 gulden (28l.) for poor scholars. The principal trades of the town and the district, which latter is largely agricultural, are building, lithography, printing, and wood furniture, and iron-work for art iron production. These subjects are taught in the Gewerbe school, which is divided into three Fach, or trade divisions, i.e., building, technical mechanics, and technical chemistry.

The Fortbildung or continuation artisan school is held in the winter from October to May in the evening from seven to nine, and on Tuesdays from nine a.m. to noon. It is divided into four sections—the first being for building; the second for metals; the third for art cabinet work, art metal work, art goldsmith and bronze work, and carving; and the fourth for painting, engraving, and photography. A special course is held for locomotive machine work; and, in addition, a Werkmeister's school—that is, a school for master workmen who are no longer apprentices, is about to be established. In ascending the wide staircase of the building Mr. Baker noted some bold decoration in Sgraffito work on the walls, and a good cast of a sphinx at the foot of the stairs, and he was told all this was the work of the scholars. In one room the pupils were composing and designing decorations for walls; an example of a leaf was given and then they had to produce a design. Others were drawing working plans for cabinet work, and, even by the first-year pupils of

fourteen to seventeen years of age, some excellent work was being produced. In the builders' and architects' sections, plans and projections were being given, such as a corner house for such and such uses. Each pupil sketches out his own idea, and every detail is worked out, doors, balcony, &c., and the material varied of stone or brick, or the two combined.

It is noteworthy that in these Imperial Royal schools, in the obligatory studies enforced by the Government, the first subject is the Polish language, then comes the German, and in the first year's course the other subjects are geography, mathematics, and physical geography, and a study of the oro-hydrographical and climatic conditions of the earth, and lessons upon the principal trade and commercial districts, algebra and geometry and geometrical drawing, experimental physics, chemistry, and free-hand drawing. Thirty-six hours a week are given to these subjects in the first year's course. In the second year the same subjects are taken, an advance being made; and in the building section, building construction and freehand drawing of architectural models, and in the technical mechanical section, mechanics and freehand drawing, with special attention to sections, parts of machines, &c., are added; with every fortnight a practical course in the workshops. In the chemical technical section general and analytical chemistry and mechanics are added, with six hours weekly in the laboratory; and mineralogy, geognosy, and freehand drawing in the mechanical section. In the third year in the building section the architectural work is developed, and knowledge of architectural form is added, dealing with columns, gables, façades, &c. In the fourth year book-keeping is taught to all sections, and in the building section the subjects are carried on to the more elaborate studies—as Greek, Roman, and Eastern architecture—and in mechanics the study of the newest agricultural machines is introduced, and civil engineering in connexion with roads, bridges, water conducting, damming, &c., is studied; whilst in chemistry such subjects as artificial manures, fat and mineral oil industries are studied, and twenty-two hours a week are given to practical laboratory work; whilst to the chemistry of agriculture is allotted three hours a week. Each year the pupils are taken for a four days' excursion into the big factories of the province to study the work done there, and lesser excursions are made in and near Cracow to study especially, and make sketches of, the buildings. Students from this school are taking up good positions in various parts of Europe, and Mr. Baker significantly remarks that although "when first the schools were started both parents and pupils were reluctant to give the time for this education, now they are eager to obtain it." He adds that "the education is especially adapted to the requirements of the locality, and this localising and decentralising of education" is carried out most successfully throughout the Austrian Empire." Mr. Baker also visited Lemberg, the capital of Galicia. This is a town of but 130,000 inhabitants, yet, as the capital of the province and the seat of the Diet it has very numerous public buildings, and its schools would astonish the inhabitants of an English town of the same size. The Gewerbe or trade technical school is an important building, with wide corridors and spacious classrooms, giving instruction to 433 pupils, with a staff of thirty-three professors and workmen or teaching foremen. The original cost of the building was 24,000*l.*, and of the site 8,000*l.* The yearly cost of the professors is about 4,000*l.* The hours of tuition are, in the winter, from 8 a.m. till noon, and 2 p.m. till 7 p.m.; and in summer from 7 a.m. till noon, and from 2 p.m. till 7 p.m. To be admitted the students must have passed through six classes of a Volksschule if trained in a village, or seven classes if trained in town. Then they have to pay one gulden (1*s.* 8*d.*) entrance fee, and four gulden yearly; if they are poor but industrious these fees are remitted. The artisans are most eager to send their children to this school, but the trades people still strive to get their children into the Gymnasium. The aim of the Gewerbe, as set forth in its statutes, is to give a professional, theoretic, and practical training to industrial workers or apprentices, and to train tradesmen and artisans in the special trades for which lectures and practising workshops are established; likewise to offer to all the opportunity to study and perfect themselves in drawing and modelling, and to give apprentices the opportunity to gain such a full knowledge of their trade that they may assimilate this knowledge with their practice in the factory or workshop. The school comprises four divisions—(1) building trades; (2) art trades; (3) modelling; (4) continuation classes. Division 1, i.e., the building trades' school, is divided into:—Section A (1) for general minor building work; (2) for carpentry; (3) for stonemasonry; and Section B, which is a school for builders, carpenters, and locksmiths, divided into two parts, where theoretic and practical workshop work go on together for three years of two half-year courses each. In the art of building the three classes of artisans—builders, carpenters, and stonemasons—are most carefully instructed. Lectures and drawing are divided for the first half-year equally—four hours each; for the second half-year five hours are given to lectures and eight to drawing for the builders and carpenters, and for the stonemasons three to

lectures and six to drawing. In the third half-year the builders have five hours lectures and twelve hours drawing, the carpenters the same, and the stonemasons four hours lectures and eight hours drawing; whilst in the fourth half-year the hours are, for the builders, two hours of lectures only. The course of study is most complete, commencing in the first half-year for all with technical terms, materials, stone and wood, trussing, stability of walls, ground floors, and roofs; the use of iron, &c.; and the drawing works in with this, with drawings to scale, &c., until in the fourth half-year elaborate buildings, with all the outward decorations and internal fittings, are worked out and studied, free scope being always given for individual expression and originality.

Books.

Theory of Engineering Construction: A Reference-book for Civil Engineers and Students. By ERNEST H. ESSEX, Assoc.M.Inst.C.E. London: The St. Bride's Press, Limited.

NOTWITHSTANDING its somewhat comprehensive title, this volume is not, nor is it intended to be, a textbook on engineering construction. It is practically a series of five sample papers on the subjects in Part II. of the Examination applying to the election of Associate members of the Institution of Civil Engineers.

Forty-eight questions are selected by the author from amongst some already set by the examiners on the four essential subjects of theoretical and applied mechanics, the theory of structures, and the strength of materials; and three questions are taken on geodesy, which is one of eight optional subjects. Answers are written to these, and explanatory diagrams are included where necessary. Although the scope of the work is rather limited, the examples chosen refer to problems of general professional interest, and the solutions are well reasoned and lucidly expressed. As an adjunct to scientific textbooks, the volume ought to be useful, and it may also be serviceable as a guide to candidates for examination. It is less likely to be adopted as a reference-book, in spite of a carefully compiled index, because so many of the points receive only such mention as may be incidental to the elucidation of the various problems under consideration. Two unnumbered blank pages occur after each answer, so that the student may insert other examples on any subject engaging his attention. We believe that very few people avail themselves in this way of interleaved pages, which are apt to constitute an inconvenience to the majority of readers.

Field Work and Instruments. By A. T. WALMSLEY, M.Inst.C.E. London: D. Foulriner (Builder office), 1900.

Land Surveying and Levelling. (Same author and publisher.)

THESE are two more of the *Builder Students' Series*, the contents of both of which have appeared in the "Student's Column" of the *Builder*, and are issued in book form with revision by the author.

In the work on levelling and surveying the object has been to provide an elementary treatise which will be useful for those intending either to be architects, engineers, or surveyors. Mr. Walmsley remarks truly, in his preface, that "part of architecture consists in the consideration of a site with a view to placing a building on the land; and in the case of a mansion to be built on a new estate, an architect who surveys the estate himself will know much more about the ground than one who, without inspecting the site, has employed a surveyor to do the survey for him."

The subject of field work and instruments is a natural sequel—or shall we say a preface—to a work considering the subject of surveying generally. Many of the younger school of architects of the day are, we fear, little at home in the handling of the level and theodolite—instruments of great interest in themselves, as well as in their practical application for reducing the facts about a site to graphic form.

Mr. Walmsley's name is so well known as an authority on these subjects that no recommendation of him on our part is necessary.

We may mention that a good many new illustrations have been added in the books, besides those which originally appeared in our columns.

Mathematical Drawing Instruments. By WILLIAM FORD STANLEY. Seventh edition. London: E. & F. N. Spon, 1900.

WHEN the first edition of Mr. Stanley's useful work was written, about thirty-five years ago, it was the object of the author to place on record what he really knew, as a practical maker, on the subject of drawing instruments, hoping that his book might prove of practical value to professional readers. That this hope has been fully realised is known by all who are acquainted with the work, and is evidenced by the appearance of the present edition, in which about one hundred pages of new matter, with many illustrations, have been incorporated, with the object of describing the most modern types of instruments and appliances used in the drawing office. At the same time, we observe that references to various obsolete instruments have been omitted, so that the volume is now thoroughly up to date in every respect. Many of the appliances illustrated are only required for special classes of work; and as to ordinary instruments, it may be remarked that as the draughtsman adds year after year to his life, he not infrequently seems to grow less appreciative of those elaborate aids which appeared so desirable in his younger days. Mr. Stanley wisely advises persons with limited means to buy good instruments separately, "as they may be able to afford them;" perhaps he might have added with advantage the words, "and as they may find the need for them." The last four chapters contain hints of especial value to students on drawing materials, colouring, sun-printing, lettering, and similar subjects.

The Practical Engineer Electrical Pocket-Book for 1901. Manchester: The Technical Publishing Company.

SEVERAL additions have been made to this useful book. The section on the gearing of motors has been made thoroughly modern, and the tables given will simplify the calculations for the choice of suitable wheels for reduction gear. It would be better to omit the difficult methods given of measuring mutual and self inductance, as they require costly and elaborate apparatus.

Fifteen Studies in Book-keeping. By WALTER W. SNAILUM. London: C. J. Clay & Sons, 1900.

INTENDING students of book-keeping have already a rather large selection of works to choose from, and we find much that appears familiar in the pages before us; but in a work designed to instruct the novice, as well as to assist the more advanced student, and starting, consequently, with elementary principles, this is, of course, only to be expected. There is, however, an unusual variety in the selection of exercises and examples enabling the student to apply the principles to practice, which tends to render the work especially serviceable.

The "fifteen studies" are supplemented by a series of worked examination papers and test exercises, dealing with widely differing kinds of accounts—including, we notice, a month's transactions of a firm of contractors—and, while the same principles may govern the business records of a grocer and a builder, it is obviously a distinct advantage for the illustrations to comprise as many trades as possible.

In the papers given for solution, certain questions appear on matters of finance which are not dealt with in the text; and we assume that their inclusion is due to its being deemed desirable to set forth the papers in their entirety. The student will find both the "studies" and exercises of great assistance in preparing for examinations, and a fair equipment for ordinary commercial book-keeping. The other questions to which we have alluded will serve to show the necessity of enlarging his studies, in the event of his aspiring to the higher branches of book-keeping.

BOOKS RECEIVED.

SANITARY INSPECTORS' FIELD BOOK. By H. G. Keywood. (R. Poole: Maldon.)

ARCHITECTURAL REMAINS OF RICHMOND, TWICKENHAM, REW, PETERSHAM, AND MORTLAKE. Drawn by Thomas K. Way, with notes by F. Chapman. (John Lane.)

THE MECHANICAL TRIUMPHS OF THE ANCIENT EGYPTIANS. By Commander Barber, U.S.N. (Kegan Paul & Co.)

Correspondence.

To the Editor of THE BUILDER.

CLERKS OF WORKS AND BUILDERS.

SIR.—In the last issue of the *Builder* is a report of a paper read by a builder before the Bristol Society of Architects, in which some remarks about Clerks of Works occur.

I cannot remember ever seeing in print, except in reports of law cases, a builder's opinion of clerks of works, and for that reason and for the inferences to be drawn from them, they are unique.

On many occasions in these columns the duties and the responsibilities of clerks of works have been discussed by architects, and by surveyors, and even by clerks of works themselves, and now at last we are allowed to know what a builder thinks it right to say about us.

Some day we may be privileged to hear what our real employers, building owners, think about us, and then our cup of joy, or otherwise, will be filled!

Clerks of works have got quite accustomed to hear opinions expressed about them by builders, but hitherto those opinions have been conveyed, as the lawyers say, *in propria voce*, and the words used and the tone adopted are usually trenchant; but clerks of works are a thick-skinned race, and one of their chief qualifications is to be able to submit calmly to insult. Therefore, nothing in the report referred to will excite feelings of annoyance, but it may cause some surprise that a builder, presumably of experience, should say "My own idea is that the clerk of works should be the architect's representative." Now, whom does the clerk of works down Bristol way represent, if he does not represent the architect?

Really, the author of the paper must have come in contact with some queer specimens of the genus, if they are not "prepared to obtain and give all information necessary to the proper carrying out of the contract," so far as it appertains to their duties. But clerks of works should, in my opinion, confine themselves to their own duties as such, and not place their knowledge and experience at the disposal of builders who, taking advantage of good nature and courtesy, will frequently obtain from their assistance that ought to be supplied by their own foremen. I have heard builders say that a first-rate clerk of works is the best foreman on the job, and so he is, if by being willing and able to render assistance outside his own duties the builder escapes the necessity of paying for proper superintendence.

For every builder who suffers by a clerk of works there are, I think, two clerks of works who have their duties nearly doubled by incompetent builders.

The author goes on to say that "one man may make the work cost 5 to 10 per cent. more than another." That I utterly deny. It is impossible for any man to do that, because the wording of all specifications and contracts that I have seen distinctly and repeatedly says that everything is to be of the best and, presumably, the most expensive of its kind, and no man can make a builder do work of a lower quality than the best. If the best, if the author had said one man may let the work cost 5 to 10 per cent. less than another I would not have disputed it; but whether that type of man is of any use to architects and owners is another question.

I do not think it advisable to pay clerks of works so much per contract. It sounds plausible, but it would not work out very satisfactorily. Architects would not "find" their works executed with much more promptitude and despatch. A system of that kind would, in my opinion, lead to scamping and connivance. Clerks of works are not consulted by architects about the duration of time allowed, and, although a vigilant clerk of works may keep a sluggish builder up to concert pitch, nothing that he can do will cause a builder who knows his business to drag a job along. Unfortunately, dragging along is more frequent than pushing ahead, but the causes for that must be looked for elsewhere than in the conduct of a

CLERK OF WORKS.

NEW BATHS AND A BRANCH LIBRARY FOR LEEDS.—At a meeting of the Baths Committee of the Leeds Corporation recently, a rough estimate was submitted of the cost of erecting a building to serve for baths and library in York-road, and for new bath premises in Broad-lane, Bramley. Sites have been already purchased, and, exclusive of this outlay, the cost will be, in York-road, about 15,000*l.*, and at Bramley about 8,000*l.* If the City Council sanction these proposals, as the committee recommend, designs will be invited, with an offer of premiums of 50*l.*, 30*l.*, and 15*l.*, in the former case, and 30*l.*, 20*l.*, and 10*l.* in the latter. Mr. Braithwaite, architect to the Leeds School Board, whose advice had been sought, reported as to the best method of repairing the leakages at the Union-street and Kirkstall-road baths. Both these baths were opened in 1895. The committee will recommend that the work be taken in hand as early as possible. Tenders for painting the Kirkstall-road and Holbeck Baths were accepted from Messrs. Gaunt.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

4.—SANITARY POTTERY.

GLAZED ware of different kinds is now so much used for sanitary fittings, that a short description of the principal varieties cannot fail to be of service.

The material most commonly used for the cheaper kinds of fittings is salt-glazed fireclay. The glaze is produced by throwing common salt into the kiln during the last stage of firing. The salt is decomposed by the heat and fills the kiln with dense fumes of salt-vapour, which enter into chemical combination with the silica on the surface of the clay, producing a thin glaze of silicate of soda; the glaze is, therefore, a portion of the fireclay itself fused or vitrified under the influence of salt. A salt-glaze has the advantage of being thoroughly incorporated with the material to which it is applied. On the other hand, it is not very smooth, as roughnesses or inequalities in the plastic clay are still apparent in the finished production. Fireclay is a somewhat brittle material, and sharp corners may be chipped off by a blow, even though glazed. For this reason all external angles ought to be rounded. The colour of salt-glazed ware is generally some shade of reddish brown, with a mottled appearance.

Doulton-ware is a salt-glazed stoneware, which is claimed to be a denser material than ordinary fire-clay. The term "stoneware" ought really to be applied only to ware which is vitrified throughout, and not merely glazed on the surface.

The materials already described are largely used for the cheaper kinds of sinks, urinals, school lavatories, latrines, and water-closets, and also for heavy fittings for factories and other places where rough usage is likely to occur.

A better surface is obtained by means of porcelain enamel, which is a thin film of porcelain fired on to the fireclay or "earthenware" body. The piece of fireclay, modelled to the required shape, is burnt in the kiln in the usual manner without the addition of salt. It is then known as "bisque" or "biscuit" ware, from its porous appearance, and the enamel is applied by covering the surface (generally by dipping) with the liquid slips and glazes necessary to produce the porcelain enamel of the required kind and colour. The article is again fired in a kiln, in order to fuse the materials applied to the surface and convert them into a thin sheet of porcelain, which, if the process has been properly carried on, will be thoroughly adherent to the "biscuit" body. In many cases, however, the enamel is far from satisfactory. It may be cracked in firing, or may be so loosely adherent to the body as to be easily flaked off by a blow or by frost. Enamelled bricks are generally made in this manner, and the enamel of inferior qualities frequently fails by flaking off. In this, as in so many cases, cheapness in first cost is not always true economy. It is better to pay a fair price for a sanitary fitting made by a firm of good reputation than to buy a cheap fitting made no one knows where.

Enamelled ware of this kind is used for sanitary fittings of medium quality and also for very heavy fittings of the best class, such as urinal-stands, large sinks, and baths. In some cases the goods are sorted into two or more qualities, the inferior ware being defective either in shape or in the enamel.

With the exception of these heavy fittings, the best sanitary goods are made of some kind of white earthenware or pottery suitably glazed. Different manufacturers use slightly different mixtures of clays, flints, &c., and adopt distinctive names, among which may be mentioned "Queenware," "Titanite," "Vitrina" ware, and "Vitro-porcelain." For convenience they may all be classed together as whiteware or porcelain. It is practically the same material as that used for ordinary household crockery, and like this, varies in strength, correctness of form, firmness, and durability of glaze, and in other respects. The quality of the pottery must be considered in appraising the value of sanitary ware, exactly as in the case of plates and dishes.

The manufacture of a piece of sanitary pottery of this kind is not by any means a simple matter. Failures innumerable have occurred in arriving at the results which are

now possible, and the greatest skill and care have still to be exercised in order to produce a perfect piece of work. A brief description of the method of manufacture adopted at Twyford's Cliffe Vale Works, Hanley, will show what skill and care are required. The selection of the ingredients is the first step in the process. These consist of kaolin or china clay, blue or ball clay, flints, and Cornish stone. Kaolin is the finest kind of clay, and is prepared from decomposed granite or felspathic rocks; it contains a certain amount of potassium, and gives fineness of texture and plasticity to the final mixture. Blue or ball clay is a fairly pure hydrated silicate of alumina, and is therefore a true clay. It is of dark grey colour, but burns white, and is introduced to give strength to the mass. Flints are pure silica, and are added to give rigidity and to control contraction. Cornish stone is a partially-decomposed granite, and serves as a flux under the influence of fire.

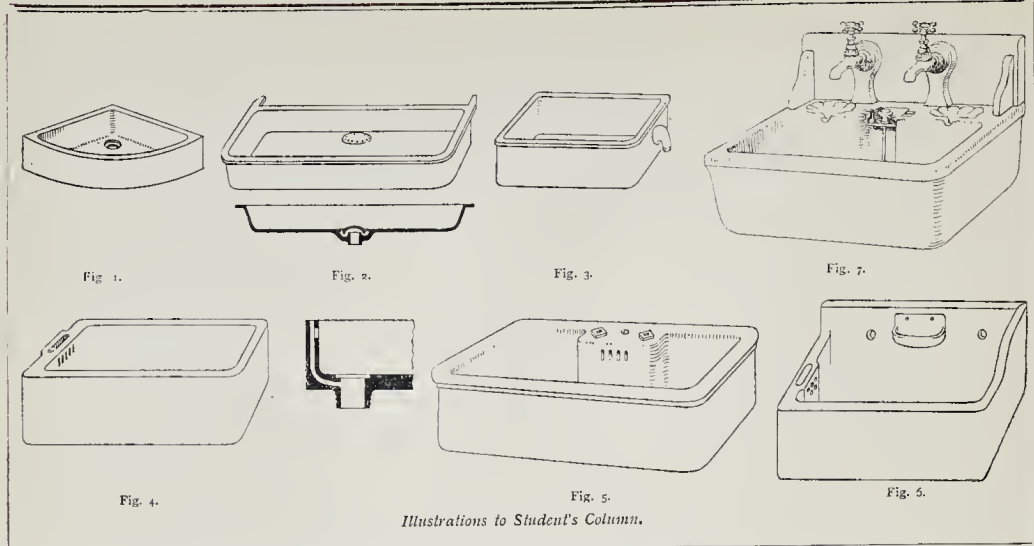
Each of these ingredients has to be prepared separately. The flints must first be calcined, then crushed, and ground between bard stones in water. The Cornish stone is similarly treated, except that it does not require calcining. The clays are disintegrated and purified by agitation with water. In each case the material must be so finely triturated as to be held in suspension by the water. The four liquids are then mixed together in proper proportions, which vary according to the nature of the earthenware required and according to the amount of solid matter in suspension. To this mixture metallic oxides are added when it is desired to give colour to the body of the ware. Coarse particles are removed from the "slip" by passing it through wire and silk sieves; and fine particles of iron, which would render the earthenware speckled, are extracted by running the slip along a trough in which a number of magnets are placed. A large proportion of the water in the slip is then removed by means of filter-presses, from which the clay is taken to the pug-mill. This is a cylindrical apparatus with revolving steel knives, by which the clay is reduced to uniform consistency, and from which it is forced in a plastic state, ready for the potter.

Before the potter can use the clay, he must have full-size plaster models of the various parts of the articles to be made. It is impossible to mould a complicated piece of sanitary ware in one piece. The ware must be built up in pieces, each of which must be separately moulded. The clay is "pressed" firmly into the moulds, so that it will be absolutely homogeneous, and then the operation of "sticking-up" is performed, whereby the different pieces are joined together. If this operation is not well done, the joints crack during firing. The "Twyford" water-closet basin is composed of no fewer than thirty-two pieces, separately moulded and then "stuck" together. After partial drying the ware is "fettled" by "trimming the edges with a knife, sponging out all mould marks, and finally finishing with a piece of horn until the surface is perfectly smooth." The ware is then dried at a moderate temperature, and is afterwards dressed by rubbing gently with very fine sandpaper.

It is now ready for the kiln. Great care has to be exercised in placing the articles in the kiln. They are protected by enclosure in earthenware "soggers." The temperature of the kiln and the duration of the firing have also to be carefully regulated. But into this part of the process of manufacture we need not enter.

The ware leaves these kilns in the "bisque" or "biscuit" state, and is then stored in a warehouse and carefully examined. Damaged pieces are thrown out, and pieces containing slight cracks, which can be stopped, are marked and passed on to women who clean the pieces and repair the defects with liquid stopping.

The ware is now ready for printing or decorating, or (if it is to be left plain) for dipping into the liquid glaze. This is prepared from ground flints and other ingredients, and is of such a composition that, on firing at a high temperature, it forms a thin coat of glass on the surface of the pottery. The glaze generally contains a certain amount of lead, and this renders the process of dipping a dangerous one, unless careful precautions are taken and absolute cleanliness observed by the workpeople. After being dipped, the ware is



Illustrations to Student's Column.

touched up by means of a camel-hair pencil, and the glaze is sponged off those parts which are to be left unglazed. The ware is then dried, at a moderate temperature, and the process of manufacture is completed by burning it again in kilns to fuse and fix the glaze. This operation requires great care both in placing the ware in "seggars" and in regulating the temperature and duration of the firing.

This brief outline of the process of manufacture will serve to show that good sanitary ware is difficult to produce, and is necessarily costly. If a good piece of pottery is required, a good price must be paid for it.

The pottery which has just been described has a more or less porous body protected by a thin coating of glass, but within recent years attempts have been successfully made to produce ware which is practically vitrified throughout, and is therefore non-absorbent. This is a valuable improvement, as it sometimes happens that the glaze is not perfect throughout the hidden parts of a complicated piece of pottery, or that, if perfect when it leaves the kiln, it is subsequently damaged. In such cases a porous body is apt to become foul. Non-absorbent ware of this kind is now made by manufacturers of the best sanitary pottery, but under various names, such as "vitrina" and "vitre-porcelain." It is slightly more expensive than ordinary ware.

5.—SINKS.

SINKS are of various kinds. Among these may be mentioned (1) the sink-of-all-work, commonly known as a scullery or kitchen sink, which, being without a waste-plug, does not hold water; (2) the sink with waste-plug and overflow, often known as a butler's sink; (3) the nursemaid's sink, which is merely a variety of the butler's sink; (4) the vegetable sink; (5) the sink for washing pans and other hardware; (6) sinks for special purposes, such as laboratories, photographers' studios, operating rooms of hospitals, &c.; and (7) the housemaid's sink, which is generally fixed in connexion with the slop sink, and will be more conveniently described in the chapter on fittings of the latter kind.

The different materials used for sinks include stone, slate, glazed ware of various kinds, cast and wrought iron, tinned copper, wood, and wood lined with tinned copper or lead. There is not one of these materials which can be considered perfectly suitable for every kind of sink, but the most generally serviceable material is good glazed ware, which has the great advantage of cleanliness. The chief objection to such ware is its hardness, which results in damage being done to delicate crockery and glass. This danger can, however, be much reduced by the use of wood grids and drainers, as will be hereafter explained.

1. *Scullery Sinks.*—In small houses the sink is often the only sanitary fitting which can be

afforded. Such sinks are of the ordinary type without either plug or overflow. In former years they often consisted of a solid slab of stone with a portion dished out to a depth of 3 in. or 4 in., but this material, although durable in a sense, has the disadvantages of being pervious to moisture, and therefore difficult to keep clean, and of wearing away in places so that the water will not flow away to the waste outlet. Salt-glazed or enamelled fireclay is now generally preferred on account of its greater cleanliness. Sinks of this kind are commonly oblong, ranging in size from about 20 in. by 15 in. to 48 in. by 24 in., the outside depth being 5 in. to 6 in. The stock sizes of different manufacturers vary, so that it is now possible to obtain from stock a sink of almost any dimensions. Angular sinks of the shape shown in fig. 1 are also made.

The defects to be avoided in these and other pottery sinks are *sharp arrises*, as these are often damaged in transit or by contact with heavy pans, *sharp internal angles*, which render the cleaning of the sink more difficult, *warping*, which is often so serious as to prevent the water running to the waste-outlet unless the sink is purposely placed out of level, *cracks* in the body of the ware, and *flaws* in the enamel.

Kitchen sinks of this type are also made in cast iron, either finished black, or galvanized, or enamelled. The example given in fig. 2 cannot be recommended, as the trap is of the "bell" form. Such a trap is objectionable for several reasons:—The flow through it is so sluggish that the trap is not self-cleansing; the depth of seal is only $\frac{1}{2}$ in., and the seal is therefore easily lost by evaporation; and the bell grate is often removed (for the purposes of cleansing the trap and expediting the discharge of the water from the sink), thus admitting more or less impure air through the waste-pipe into the house.

Porcelain-enamelled iron sinks are easily damaged, as the enamel chips off under a comparatively light blow or if very hot water is suddenly poured on to it. Galvanized iron is better, unless the water is soft moorland water, when the coating of zinc is soon eaten away and the iron exposed to the corroding influences of moisture and air.

2. *Butler's Sinks.*—Sinks of the kind already illustrated are really nothing but fittings for the reception of the foul water poured from vessels of different kinds, and of water dripping from the taps or draining from articles which have been washed. They do not hold water, and "washing-up" must therefore be performed in a vessel of wood, papier-mache, or metal, placed in the sink. Such an arrangement is often inconvenient, and in large establishments is practically unworkable. The desired improvement is obtained by fitting a plug to the waste outlet, so that the sink will retain water, and this alteration necessitates an overflow, so that, if a tap is left running when the waste is closed, the water can escape

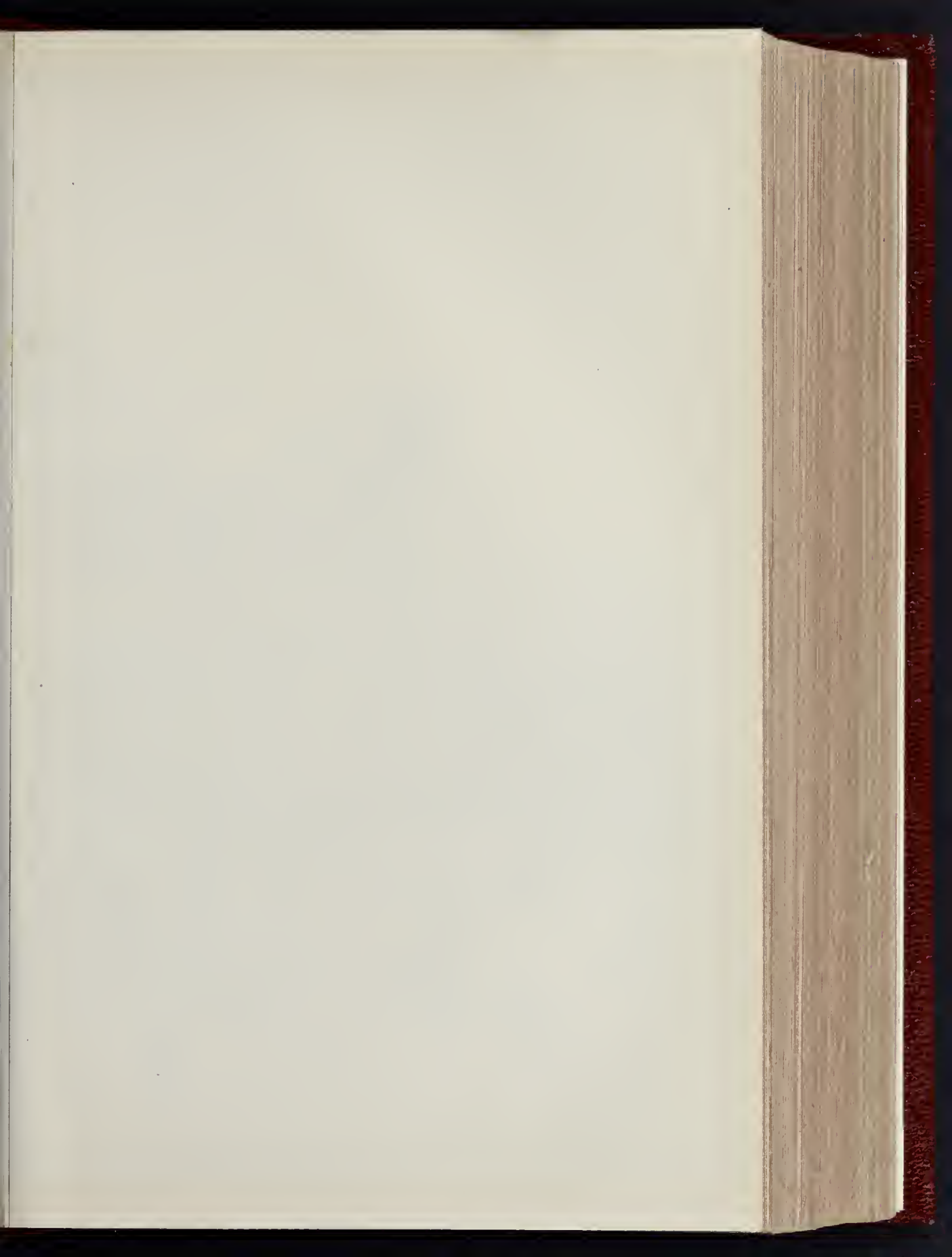
without overflowing the sides of the sink. A sink of this kind is shown in fig. 3; the overflow is of an old-fashioned type, consisting of a pottery bend (in one piece with the sink), to which a lead pipe can be attached to convey the water to the sink side of the trap, or (if the local regulations demand) the lead pipe can be taken straight through the wall to the open air. These sinks can be obtained from 15 to 27 in. long, 12 to 16 in. wide, and 7 to 10 in. deep, outside measurements.

Overflows of this kind cannot be kept clean, and a much better arrangement is shown in fig. 4, which is often known as the "Belfast" pattern. In this case, the overflow is formed in a projecting portion of the pottery, and is continued up to the top of the sink, so that a small wire brush can be inserted to cleanse the passage. A porcelain or metal cap to cover the top of the opening is provided in preventing the ingress of substances which might choke the overflow. These sinks are made from 24 to 48 in. long, 16 to 24 in. wide, and 7 to 12 in. deep. In fig. 5 the overflow is placed in a projection inside the sink, and the same projection affords space for the water-taps and the standing waste. This is made by Doulton & Co. in two sizes, 30 in. by 18 in., and 36 in. by 24 in., both 8 in. deep. The roll edge is much less likely to be chipped than a square arris.

Cast-iron sinks, with overflows similar to that shown in fig. 4, are now made in sizes from about 15 in. to 36 in. long, about 14 in. wide and 7 $\frac{1}{2}$ in. or 8 in. deep. Semicircular and quadrant sinks can also be obtained. The iron is finished by painting, galvanising, or enamelling with glass, porcelain, or coloured vitreous enamel. Some idea of the relative cost of these methods of finishing will be gathered from the following list prices of a sink 36 in. by 14 $\frac{1}{2}$ in. by 7 $\frac{1}{2}$ in.—painted, 10s.; glass enamelled, 18s.; vitreous enamelled, 25s.; white porcelain enamelled, 32s. 6d.

Sinks with high backs, such as that shown in fig. 6, have the advantage of preventing a certain amount of splashing, but the taps must not be fixed so low as to render the drawing of water into ordinary vessels an impossibility. Sinks with raised sides are also made as shown in the right-hand portion of the illustration. The sizes range from 24 in. by 14 in. by 10 in., to 48 in. by 24 in. by 12 in., the raised backs and sides being 5 in. higher.

Shank's new form of sink, illustrated in fig. 7, contains an improved overflow of large size readily accessible for cleansing, and a pull-up waste which can be removed with the greatest ease; to open the waste, the knob, carrying a crossbar which slides in metal grooves embedded in the pottery, is raised and moved backward so that the cross-bar rests on the horizontal portions of the grooves, and the removal of the waste is effected by raising the cross-bar through the upper vertical portions of the grooves. The sink is supplied either with or without the raised back, and measures



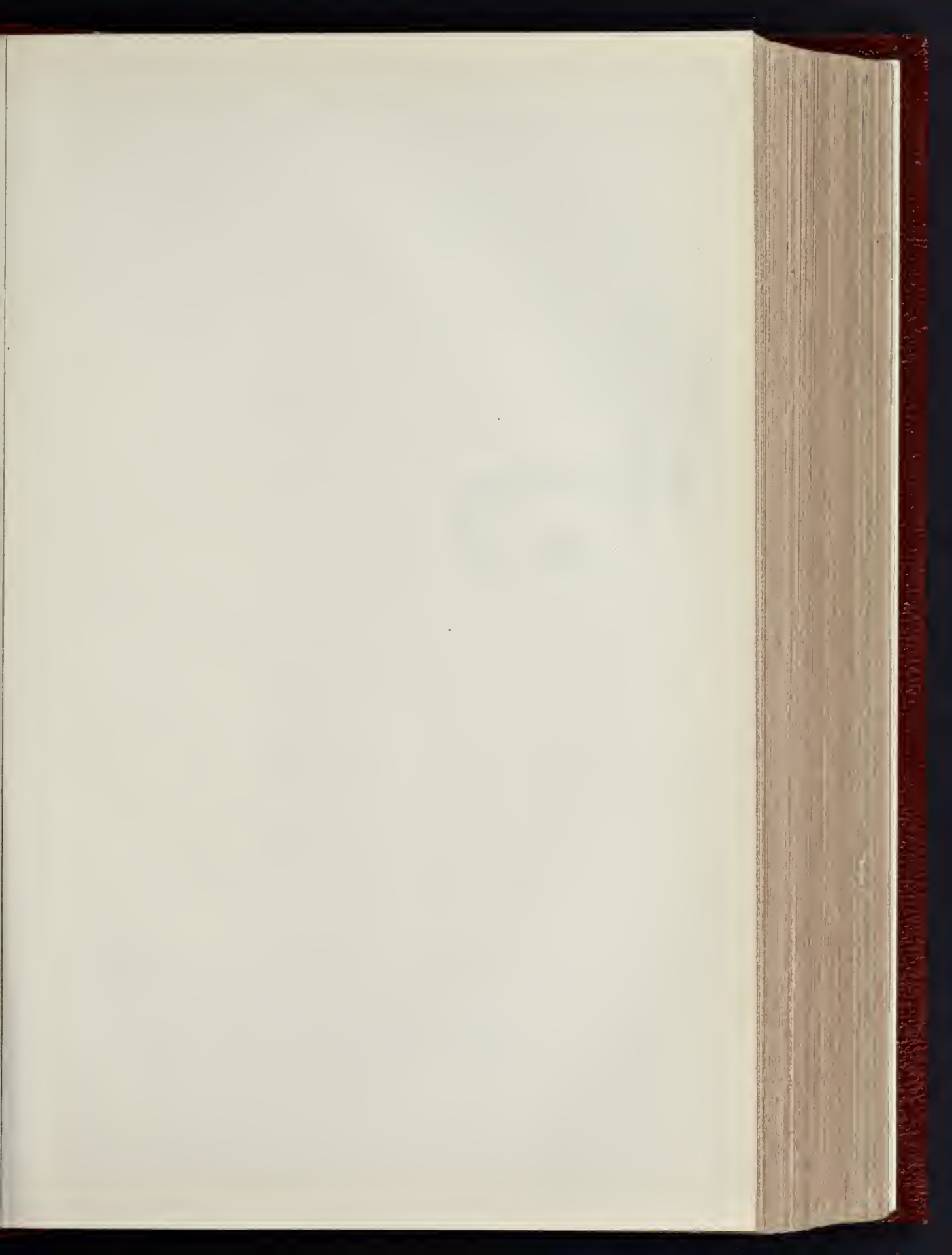


GLASGOW ROYAL INFIRMARY COMPETITION: DESIGN FOR THE BUILDING
PERSPECTIVE VIEW



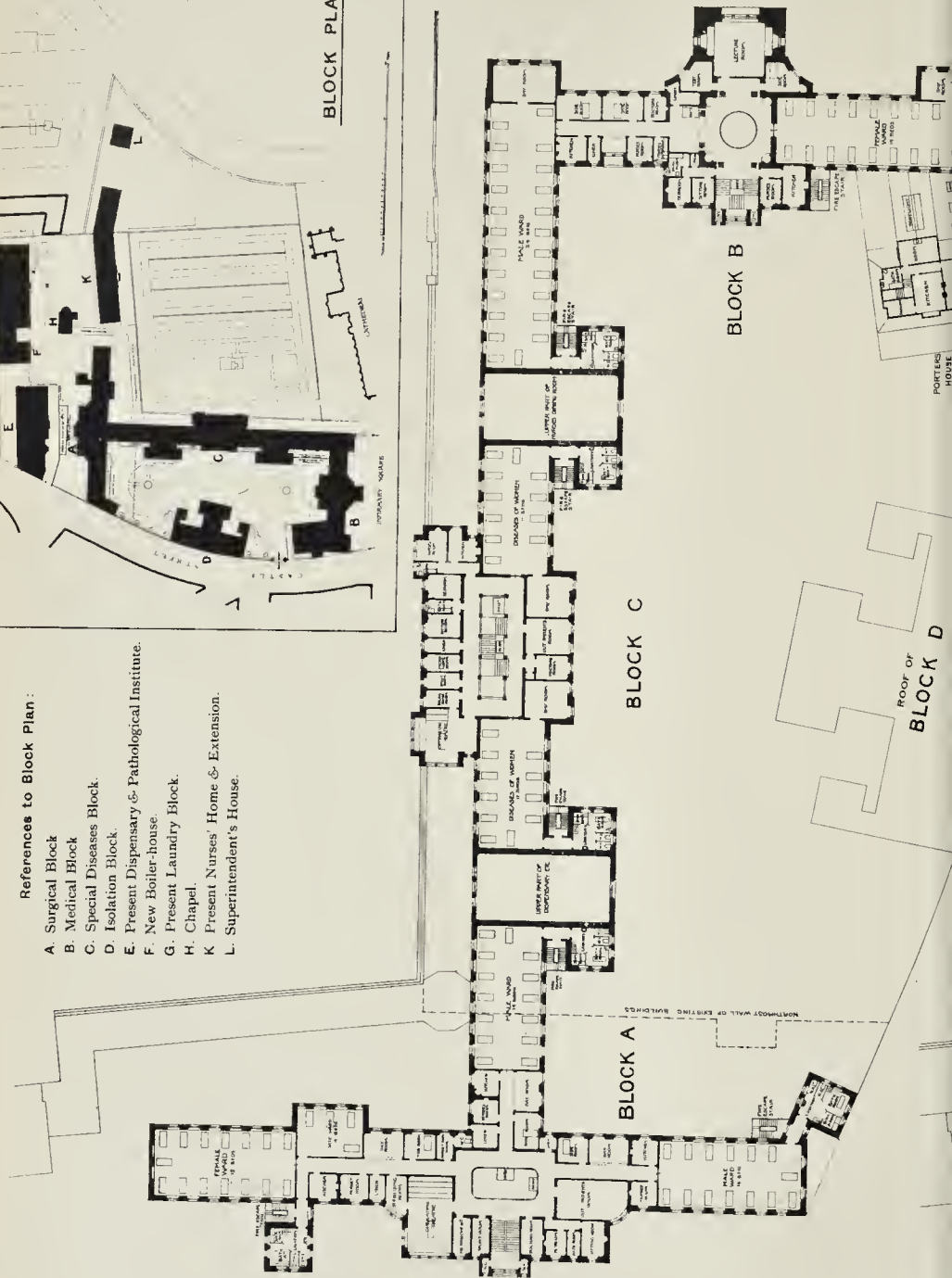
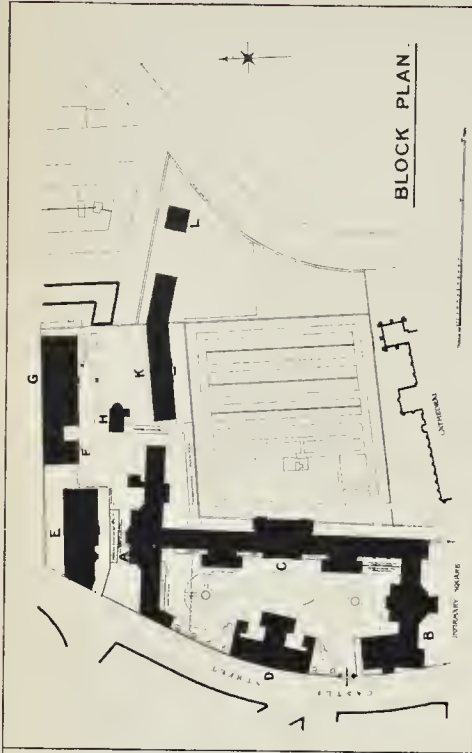
PHOTO-LITHO SPRAGUE & CO. LTD. 4 & 5 EAST MARKING STREET, FETTER LANE, E.C.

ED FIRST BY THE ASSESSOR.—MR. H. E. CLIFFORD, ARCHITECT.
RDS INFIRMARY SQUARE.

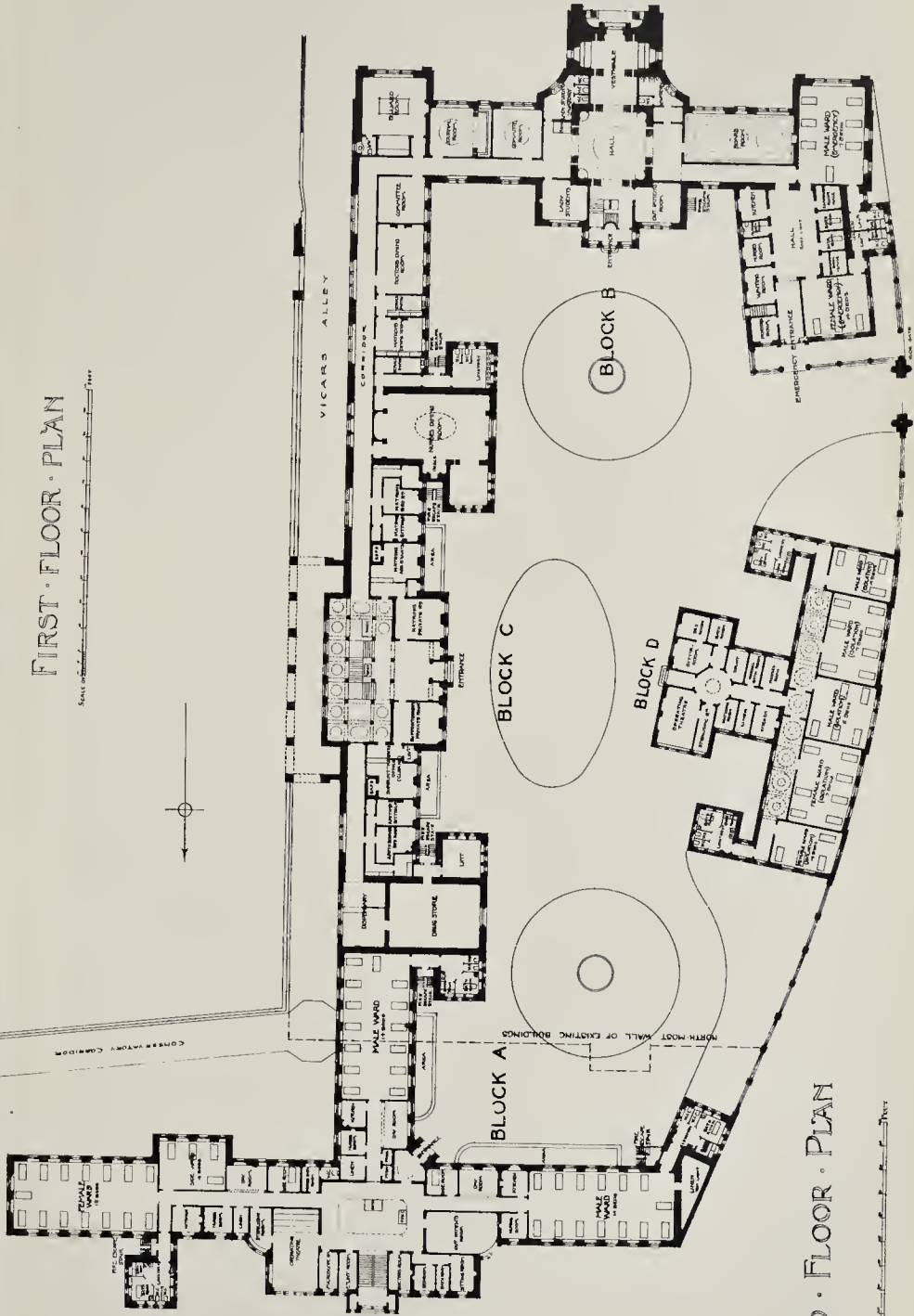


References to Block Plan :

- A. Surgical Block
- B. Medical Block
- C. Special Diseases Block
- D. Isolation Block
- E. Present Dispensary & Pathological Institute.
- F. New Boiler-house.
- G. Present Laundry Block.
- H. Chapel.
- K. Present Nurses' Home & Extension.
- L. Superintendent's House.



FIRST FLOOR PLAN

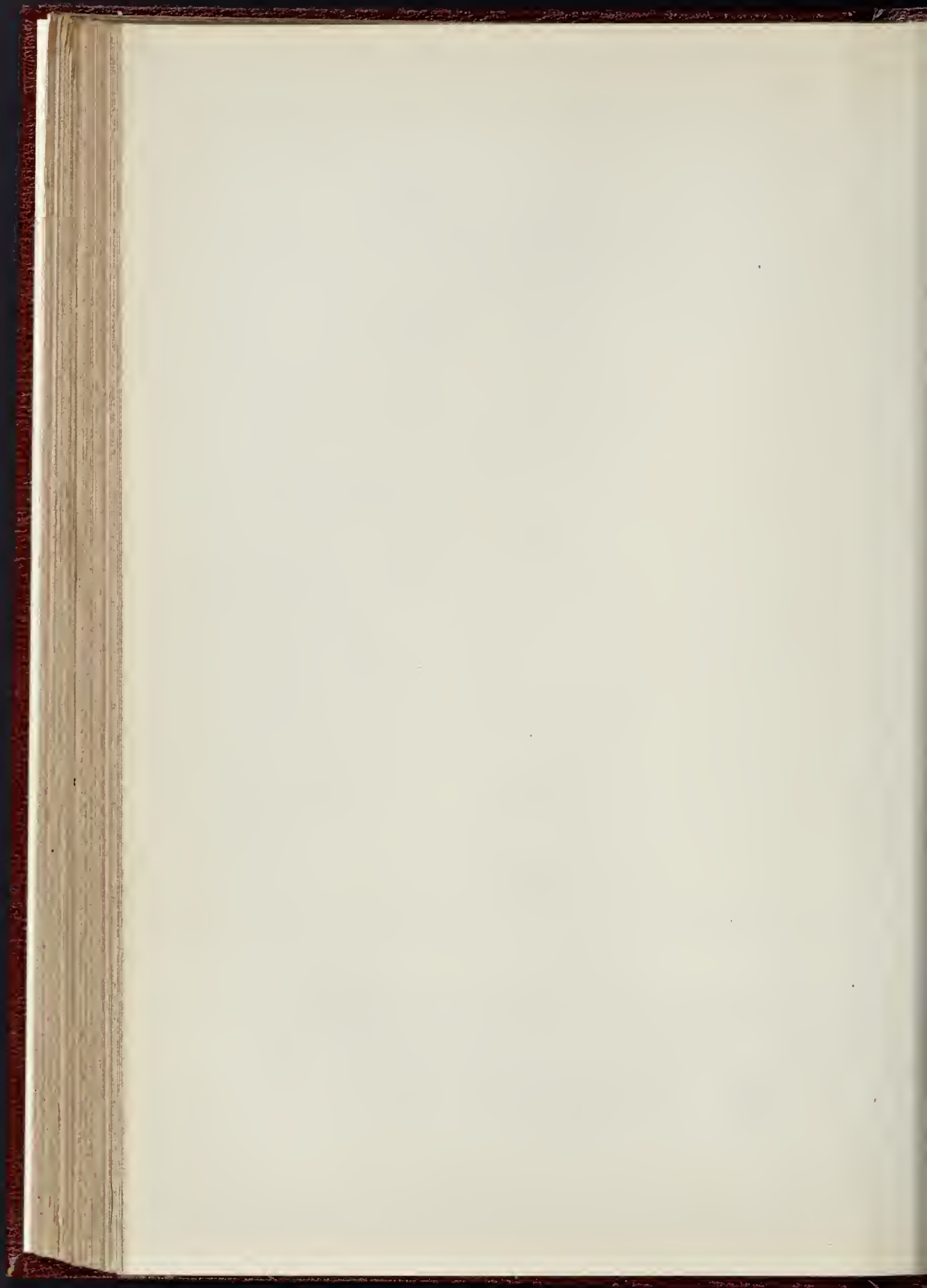


GROUND FLOOR PLAN



PHOTO-LITHO SPRAGUE & CO. 4 & 5 EAST HADDING STREET PETERHEAD E C

GLASGOW ROYAL INFIRMARY COMPETITION: DESIGN PLACED FIRST BY THE ASSESSOR—MR H. F. CHISHOLM, ARCHITECT



25 in. by 19½ in. by 9½ in. deep. It can be supported on a central pedestal, or on iron standards or wall-brackets.

OBITUARY.

MR. JOHN BURNET.—We regret to have to record the death, on January 15, in his eighty-eighth year, of Mr. John Burnet, of St. Kilda, Downhallow, Glasgow. Mr. Burnet was elected Fellow of the Royal Institute of British Architects in 1876. He was an original member of the Glasgow Institute of Architects, of which he was President in 1876-8, and a member of Council during many years. Mr. Burnet was father of Mr. John James Burnet, A.R.S.A., of Glasgow, and senior member of the firm of Messrs. John Burnet, Son, & Campbell. Of architectural works carried out by that firm the following have been illustrated in our columns: The Western Infirmary, the new Barony Church, and the Athenaeum (two views), Glasgow (July 9, 1898, "Glasgow," No. XVI. of our series of "The Architecture of our Large Provincial Towns"); and Athenaeum, Glasgow, with plans (October 21, 1893); competition designs, by the then firm of John Burnet & Son, for the Birmingham Law Courts (August 14, 1886), and Model Dwellings, Cathedral-court, Rotten-row, Glasgow (October 15, 1892). The firm were the architects also of the Art Gallery, Glasgow (J. Burnet & J. J. Burnet), a church at Stenhousemuir, Stirling, to commemorate Dr. McLaren's jubilee (John Burnet & Son); and in Glasgow, the Pathological Institute, the Subway Station near Glasgow Cross, Albany Chambers, and Cross-mansion, the Savings Bank in Ingram-street, the Clyde Trust Office, the Merchants' House, the Stock Exchange, the Union Bank, the Clydesdale Bank, and the Woodlands-road United Presbyterian Church. The Public Baths at Alloa, planned and designed by them, were completed in May, 1898. Mr. Burnet was, we believe, the author of the plans for the restoration of Arbroath Church that were approved in December, 1883; and he designed several mansion-houses in the neighbourhood of Glasgow and the West of Scotland.

GENERAL BUILDING NEWS.

RESTORATION OF GARVESTON CHURCH, NORFOLK.—The parish church of Garveston has been partially restored. The work has been executed by Messrs. Springall & Son, of Swanton Morley, from plans prepared by Mr. A. J. Lacey, of Norwich.

CATHOLIC CATHEDRAL FOR LEEDS.—We understand that the plans for the new Roman Catholic Cathedral in Leeds will be deposited with the city authorities for their approval in the course of a few days. The building, which is to take the place of St. Anne's Cathedral—scheduled in connexion with the Cookridge-street improvement—will occupy the site lying between the new Masonic Hall and Cookridge-street. It will be in the Early English style. Solidity and simplicity appear to have been aimed at in the designs. The presbytery, or clergy house, forms part of the church building. One remarkable feature will be the provision of double side aisles, an arrangement which has been made possible by the comparative breadth of the site in proportion to its length. The cathedral, both inside and out, will be built of stone, and the main entrance will be from Cookridge-street. It is anticipated that about two years will be required for the completion of the scheme. The schools, which were opened in the fortress by Daniel O'Connell, are also to be demolished, and new ones will be erected on a more convenient site in the parish. It is understood that the authorities of the cathedral will receive about 46,000l. from the Corporation in addition to building sites, and of this sum it is estimated that about 33,000l. will be spent on the cathedral and presbytery. The architect is Mr. J. H. Eastwood, of Kensington. *Yorkshire Post.*

BOARD SCHOOLS, WEST HARTLEPOOL.—The Lister-street Board schools at West Hartlepool were opened on the 20th ult. The schools give accommodation for 1,502 scholars, and have cost 18,997l. They are on the central hall system, and were designed by Mr. Percy Hinde, of Liverpool. Mr. Beetham, of West Hartlepool, was the principal contractor.

BOARD SCHOOL, BLACKPOOL.—The foundation-stone has just been laid of a Board school in Devonshire-road, Blackpool. Mr. R. B. Mather is the architect, and Messrs. Cardwell Bros. are the contractors.

NEW BANK AT ROCHESTER.—The Capital and Counties Bank Limited, have just opened a branch at 69, High-street, Rochester, opposite the post-office. Part of the building is of Elizabethan date, extensively altered and subsequently rebuilt in the eighteenth century and partly rebuilt in the nineteenth century and subsequently. In excavating to form the strongroom fragments of Roman pottery were found at a considerable depth below the present level. The house is well known on account of its then owner, Sir Richard Head, having given hospitality to James II, in December, 1688, and from it the fugitive king escaped to the river and so to France. The house and large garden will be occupied by the manager, while a portion of the

ground floor, until recently used as a shop, has been altered for the purposes of the bank. The shop front has been replaced by a front of Portland stone, simply treated with the arms of the bank carved over the entrance doorway. The walls inside were partly lined with eighteenth century large deal panels; these have been repaired and completed. The new doors, counter, and fittings are of oak. The counter affords accommodation for two cashiers, and is protected by a brass grille. The floor in front of the counter is paved with Rust's vitreous mosaic, the remainder with wood blocks. The window of the manager's-room has been filled with glass bearing upon it the arms of the present owners, the past owner, Sir R. Head, and his guest, James II, and others. A lavatory for the clerks has been built at the back, and a strongroom in the basement. The wood-block flooring is by Turpins Company, the beating by Jones & Sons, the brasswork by Vaughan & Brown, metal casements and glazing by R. E. Pearce & Co., and the strongroom door by the Ratner Safe Company. The builders are West Brothers, of Strood and Rochester, and the architect Mr. E. F. Cobb, of Rochester.

WATER COMPANY'S NEW OFFICES, SOUTH SHIELDS.—This proposed building is planned in two departments, communicating, one for office and public use, and the other for workshops. The building has elevations to Chapter-row and the Market-place, the latter being built on the ground floor with polished red and grey granite. The upper stories are finished in red brickwork, relieved with moulded and carved stone work. On the ground floor there will be a large general office approached through a tiled hall. Communicating with the general office is a manager's room, strong-room, telephone-room, &c. The remainder of the ground-floor is devoted to workshops, &c. The first-floor is approached by a stone staircase, and contains a board-room, of which the inspector's and other offices, and additional workshops. On the top floor a suite of dwelling-rooms has been provided, together with further offices and store-room. The work, which is expected to cost between 7,000l. and 8,000l., is being carried out by Mr. R. Allison, of Whitburn, from the designs and under the supervision of Mr. Henry Grievae, architect, of South Shields.

WORKMEN'S DWELLINGS, LIVERPOOL.—On the 22nd ult. at the Municipal Offices, Liverpool, Colonel A. J. Hepper held an inquiry on behalf of the Local Government Board into an application by the City Council of Liverpool for sanction to borrow 53,500l. for the erection of dwellings for persons of the labouring classes. It was stated that the present scheme of the Corporation was to provide for 3,056 dispossessed tenants. It comprised four houses in Arley-street, 114 in Kew-street and Newsham-street, ninety houses in Clive-street and Shelley-street. The houses would be of different sizes, the rents to range from 6s. 3d. per week for four-room dwellings, comprising a living-room, three bedrooms, and scullery, to 3s. 3d. a week for two-room dwellings.

MASONIC HALL, FROCKHEIM, FORFARSHIRE.—The new hall of the Bruce Lodge, No. 503, at Frockheim, was opened on the 19th ult. The building is in Gardyne-street, and was formerly a chapel. The necessary alterations were carried out under the supervision of Mr. W. G. Lamond, of Frockheim, by the following contractors:—Mr. Charles Esplin, masonry; Mr. John Macbeth, joinery; Mr. Dargie, Arbroath, painting; Mr. William Wishart, slating, &c.; heating apparatus, Messrs. A. L. Peacock & Co., Dundee.

PUBLIC LIBRARY, STIRLING.—A public library is to be erected at Stirling, from plans by Mr. H. R. Taylor, of Messrs. Lessells & Taylor, Edinburgh. The cost is estimated at 6,000l.

FISH MARKET, CARDIFF.—The new market for fish, poultry, fruit, &c., in Working-street, Cardiff, is constructed of brickwork with Bath stone dressings. The building is 158 ft. long by 63 ft. wide. The hall is paved with concrete, and the walls are lined with white glazed bricks to a height of 8 ft., and above that with buff bricks. The lighting will be by electricity. Mr. W. Harpur, the Borough Engineer, designed the building.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, DANBURY, ESSEX.—Mr. M. K. Northan Inspector to the Local Government Board, conducted an inquiry, at Danbury, on the 23rd ult. into an application by the Chelmsford Rural District Council for sanction to borrow sums amounting to 4,430l. for water supply works for the parishes of Danbury, East Hammingfield, Little Baddow, Rettendon, Runwell, Sandon, and Woodham Ferris. Mr. J. Dewhurst, Surveyor, said that the new scheme was based on a report by Messrs. Taylor, Son, & Santo Crimp, of Westminster. That firm attributed the failure of the original scheme to an insufficient supply of water and to the faulty hydraulic gradients. The requirements of the district were estimated to be 47,700 gallons a day. He had found after two years' experience that the daily amount required was about 35,000 gallons. It was proposed to purchase thirty-three acres of land surrounding St. Thomas's spring. The daily supply from the two springs and collecting pipes to be laid from the springs across the common to the reservoir was estimated to be 58,880 gallons. They proposed to

erect a reservoir holding 60,000 gallons on Danbury Common. The scheme has met with considerable opposition.

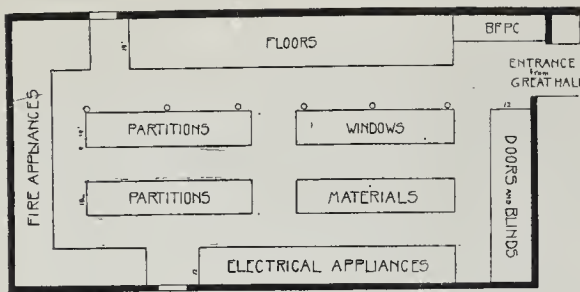
DOVER AND ITS WATER SUPPLY.—Some interest has been aroused lately by figures published with regard to the returns from the water supply works at Dover. As a matter of fact Dover seems to have made an excellent investment in securing its own water works. Year by year, although the water is supplied to householders at a much cheaper rate than in the great majority of towns in the kingdom, large profits are made from the municipal water supply and utilised for the reduction of the General District rate. At the Council meeting last week no less than 4,337l. profit on last year's water supply was transferred in this manner to the relief of the local rates. The surveyor on the same occasion reported the very satisfactory fact that increased meter supply and prevention of wastage in water had resulted in a saving of 579l. on the year. The returns made by the Borough Surveyor with regard to the water consumed at Dover are also interesting—especially to Margate, concerned as we are in regard to our own supply. It seems that at Dover during the year the quantity of water supplied for all purposes was 422½ million gallons, 99½ million gallons being supplied by meter and the remainder, 322½ million gallons, being for domestic supply, street watering, flushing, gardens, &c. He wished particularly to call attention to the great increase in the supply through meters. In 1804 the total supply was 321½ million gallons; by meter 31 million gallons, and supplied other than by meter 291 million gallons. In 1899 the total supply was 434 million gallons; by meter 88½ million gallons, and supplied other than by meter 345½ million gallons. In 1900 the total supply was 422½ million gallons; by meter 99½ million gallons, and supplied other than by meter 322½ million gallons. This showed the total supply per head in 1900 to have been 28½ gallons. For trade purposes 682 gallons per head was used, which left a supply for domestic purposes, street watering, &c., of 221 gallons per head. The income derived from the sale of water by meter was, in 1804, 775l.; in 1899, 2,211l.; in 1900, 2,480l. By a comparison of the total supplies in 1899 and 1900 it would be seen that 11½ million-gallons less were supplied in 1900, although the meters showed an increase of 11 million gallons over the previous year. So that, apart from the increased meterage, the supply was 22½ million-gallons lower than in 1899, although a larger population was supplied. This was mainly due to the recommendations adopted by the Water Committee. On the basis of the rate charged for water, 25l. per million gallons, the saving amounted to 579l. The Surveyor further informed his Council that in 1804 the total consumption per head was 2755 gallons.—*Thames Times.*

MISCELLANEOUS.

LONDON SCHOOL BOARD.—The usual weekly meetings of the London School Board were resumed on the 24th ult., after the Christmas recess. Lord Reay, Chairman, presided. *Rehousing*—The Home Department, in reply to a letter from the Board on the question of their liability for rehousing in the cases of some of the properties scheduled by the Board, stated that the Secretary of State had given the subject most careful consideration, and decided that the numbers for whom the Board might be called on to provide accommodation would be: St. Matthew, Bethnal Green, 483; St. Leonard, Shoreditch, 203; St. Giles, Camberwell, 281; Bermondsey, 263; Mile End and Ratcliff, 510; total, 1,830. The length of time which had in some instances lapsed since the acquisition of the houses taken by the Board, the shifting of population, and the accommodation of some of the persons displaced in vacant tenements in the neighbourhoods, were also matters which had a bearing on the question of the number of new dwellings to be erected, and in the present case the Secretary of State in the exercise of his discretion was willing to agree to allow the provision of accommodation for a total of not less than 1,200 persons to be deemed sufficient. He would also be willing, if the Board desired it, to agree to their contracting with a Public Authority, or with a responsible company, for the erection of the buildings. The Board's liability would, however, not be removed, and the scheme would be the Board's and would have to be approved by the Secretary of State. It was resolved to accept the provision of accommodation as satisfying the Board's liability.

REGISTRATION OF PLUMBERS.—On Wednesday the 23rd ult. a deputation of members of the Parliamentary Committee of the Irish Trades' Congress waited upon the Right Honourable George Wyndham, Chief Secretary for Ireland, in Dublin, to urge his support of the aims of the Congress, including the registration of plumbers under statutory powers. In the course of a sympathetic reply, Mr. Wyndham expressed his sense of the importance of plumbers' work, and his opinion that a number of deaths and a great deal of disease were attributable to defective sanitation and to bad work by incompetent plumbers.

BUILDING TRADES' EXHIBITION.—The Fire Prevention Section at the Building Trades' Exhibition is now taking shape, and the arrangement of the



Plan of the Fire Prevention exhibit for the Building Trades' Exhibition.

Hall has been definitely decided upon. The Hall will practically be divided into groups as shown on the accompanying plan. The Hall is being re-decorated, and should hence present a better appearance than is, unfortunately, generally the case with exhibitions of this description. If possible, arrangements will be made to bring the various exhibitors into line as to the displaying of their exhibits, and to place them in such a way that the different classes of materials are in close proximity to one another.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual meeting of this Association was held on the 23rd ult. at the office in the Guildhall, under the presidency of Mr. E. Walters (vice-president of the Association). The Chairman moved the following resolution:—"That the members of the Bristol Master Builders' Association, at their annual meeting held at the Guildhall, Small-street, Bristol, on January 23, 1901, desire very humbly to convey their condolences to the members of her Majesty's august family in their great bereavement. Her Majesty has, during her long and successful reign, endeared herself to the nation, and the marked advances made in trade and commerce, both at home and in her Majesty's colonies and dependencies, will ever make Queen Victoria's reign stand out prominently in the annals of English history." Mr. G. Wilkins seconded the resolution, which was adopted, all the members rising. The Secretary (Mr. H. J. Spear) read the report, from which we extract the following:—An increase in wages of 3d. per hour has been granted all the way round, with the exception of the plasterers, to whom a rise had been granted in the previous year. A revision of the working rules has also taken place, and the rules have been signed by both parties. During the year the committee have devoted considerable attention to the revision of the schedule of daywork prices, and after several meetings a schedule was unanimously adopted, and the same has been circulated amongst the members of this Association, and also the architects, engineers, and surveyors of Bristol, and the School Board, Sanitary Authority, and other bodies. The question of depositing priced bills of quantities with tenders has upon several occasions been discussed, not only by the committee, but by the members of the Association generally, and it was definitely decided by the National Federation at their half-yearly meeting that no bill of quantities shall be deposited at the time of sending in the tender, and shall only be deposited when the contract has been signed, and then only under seal. The sub-committee of the Association has had under its consideration the question of an improved form of contract between the Corporation and the builders of the city generally. Numerous interviews have taken place between the Corporation officials, the solicitor of the Association, and others. It is hoped, during the course of the next few months, that a form will be agreed upon that will be mutually acceptable to all parties. The matter of apprentices is engaging attention, and it is hoped that at an early date a tabulated statement will be issued in respect thereto. The subject of the Workmen's Compensation Act is one which still remains very unsatisfactory. Prior to July, 1897, every workman laboured at his own risk, the master being liable to compensate only when the accident, broadly speaking, was due to the fault or negligence of himself or of someone in his service whom the workman had to obey. It seems, however, that this did not meet the case of the man who, without fault of his own, was injured at ordinary duties, and after much consideration by both political parties a Bill was produced, which, after Parliamentary discussion, became the Workmen's Compensation Act (1897). The original Bill was badly drafted, and a large number of amendments were made without full consideration of their secondary effects. In spite of all defects, however, the Act has been a great benefit to the men, and we do not believe that the masters would now repeal the measure if they could. The money cost of the liability has to be met by them in the first instance, but, like every other trade charge, it ultimately lands on the consumer. As a rule, the individual man is unable to maintain himself long

when disabled, and the average master, however willing, is unable to do it for him. Both of these difficulties are met by this Act, which serves to spread the burden; the slightly enhanced price of commodities being really a small indirect tax on the community for the relief of those who are killed or wounded in its industrial service.—The Chairman proposed the adoption of the report and balance-sheet. Mr. W. Church seconded the resolution, which was carried unanimously. The Chairman referred to the absence of their president (Mr. George Humphreys) through illness, and said that he had seen Mr. Humphreys lately, and he hoped soon to be recovered. Mr. G. Wilkins proposed that Mr. E. Walters be elected President for the ensuing year. Mr. W. Church seconded this, and it was carried. Mr. Walters acknowledged the compliment, and said he would endeavour to do all he could for the trade and the Association. On the motion of Mr. Krauss, seconded by Mr. F. N. Cowlin, and supported by Mr. Scull, Mr. George Wilkins was elected vice-president. Mr. Wilkins returned thanks for his election. Mr. W. Church proposed that the following be elected members of the committee:—Messrs. E. I. Neale, J. Lovell, F. N. Cowlin, F. A. R. Woodard, A. Dowling, J. Eastbrook, C. A. Hayes, and W. K. Thomas. Mr. Krauss seconded the resolution. On the motion of the Chairman, seconded by Mr. Dowling, Mr. G. Humphreys was voted of thanks to Mr. Neale for his services. This was carried; and subsequently, on the motion of the Chairman, seconded by Mr. Thomas, thanks were voted to the retiring president.

WHITE HART HOTEL, OXFORD.—The architects for this building, mentioned in our last, write to say that it is by Messrs. Davy & Salter, not Mr. Stephen Salter, as given in our paragraph.

DISCOVERY OF A ROMAN VILLA AT ROTHLEY, LEICESTERSHIRE.—While engaged in excavations close to the railway-cutting at Rothley Station for the purposes of road-making, the workmen have unearthed some remains of what promises to be a Roman villa. The discovery was made close to the spot where Roman remains were found when the water main at Rothley was being laid some time since. At that time some portions of a Roman pavement were dug up, together with other valuable finds, including a piece of red Samian ware, and also the beautiful fibule, which is now in the Leicester Museum. Several other valuable relics were discovered in the vicinity, and pieces of bone were taken up in one place where there were said to be several graves. These relics excited considerable interest at the time, and it was suggested that proper excavations should be made. This was not done, however, and nothing more occurred until the discovery a few days ago of the foundations of a villa revived interest in the matter. While working, one of the workmen struck his pick against some hard substance, which proved on further examination to be a concrete floor of great age. After this the greatest care was used, and continuing their efforts, a whole room was laid bare. The floor was surrounded by the remains of walls about 2 ft. in height from the base. These were constructed of rough granite, filled with concrete. The granite had evidently been covered with plaster. The part uncovered would appear to be the heating-room of an extensive villa, judging by the flues which were found close to the spot when the water main referred to was laid. Near here were discovered some roofing tiles, a few pieces of bone, and a piece of a mortar, apparently used for pounding food, perhaps grain, &c. The mortar was of pottery ware, the inside being lined with small flints pressed into the clay before baking. There appears to have been a very extensive villa at this place, but, unfortunately, the greater part of it seems to lie under the new road. As far as it has been uncovered, it can be seen that the foundations are in perfect condition. The concrete floor of the room is intact, and from this spring a number of small pillars, the bases of which remain. Among the things found there is a piece of red Samian ware, which appears to have been the spout of a Roman lamp. The discovery of this

portion of the villa is of the highest interest, as it shows the extent of the Roman occupation of Leicestershire. The work will be proceeded with, and it is hoped to unearth the whole of the villa.—*Leicester Post.*

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Bristol, on January 25 and 26, three candidates presented themselves, and the following two candidates were awarded certificates:—W. S. Brabner and W. O. Torr.

FITZGEORGE AVENUE, HAMMERSMITH ROAD.—On January 16, the Lord Mayor, attended by some of his suite, opened a new thoroughfare which has been made from North End-road to a point near the south side of St. Paul's School. The street, which is 50 ft. wide and about 400 yards long, was built by Mr. Henry Lovatt, after Mr. Delissa Joseph's designs and plans. On each side of the road are blocks of residential flats, some of which are already taken or ready for occupation. The blocks differ from one another in respect of their planning and design, so as not to present a prolonged repetition of the same elevation.

EDINBURGH BUILDING TRADES EXCHANGE.—The second annual dinner of the Edinburgh Building Trades Exchange took place on the 17th ult. in the Royal British Hotel, Princes-street, Treasurer Graham Yoell (Leith) presiding over a company of about seventy gentlemen. After the usual loyal toasts had been honoured, Councillor Forrest proposed "Kindred Associations." In replying, Colonel Bennet said he had no doubt they were feeling with the Glasgow Exchange that the members did not take that interest in the Exchange they ought to do. The Exchange was made and thought of for the good of the trades they were connected with, from the very root of the tree to the very top. They wanted the Exchange, beginning with the architect, to take in the builder, the constructor, the finisher—every one connected with the trade. They desired that they should all be united in the Exchange. Colonel Bennet further counselled them to keep abreast of the times in their various lines of business. Other countries were making vast strides; they must make a point of seeing they were not left behind in the race. Mr. J. C. Hamilton proposed the "Imperial Forces." Captain Moscrop replied. Mr. A. P. Laurie gave the toast of the "Magistrates and Town Councils of Edinburgh and Leith." Councillor Pollard and Bailie Kinnaird replied. The former remarked that the relations of the Town Council of Edinburgh with the building trade and building interests were of a very satisfactory kind and the Council were only doing their duty if they were trying to make that satisfactory condition of things a matter of long continuance. Bailie Kinnaird, in replying, scouted the idea of amalgamation or union with Edinburgh. Leith, he said, had made greater strides in the direction of improvement than any other town in Scotland. He hoped they would soon have better tramway communication between Edinburgh and Leith. Mr. John Robertson having proposed "The Edinburgh Building Trades Exchange," the Chairman responded. It had taken a great number of years, he said, to make the Exchange what it was at present, although it had only been constituted for the last three years as the Building Trades Exchange. He earnestly pleaded for further support to the Exchange, which was endeavouring to extend its sphere of usefulness.

PETERHEAD MASTER BUILDERS' ASSOCIATION.—The annual supper of Peterhead Master Builders' Association was held on the 10th ult. in the Palace Hotel. Mr. Alexander Webster, builder, presided, and Mr. Alexander Milne, engineer, was crozier. The Chairman, having proposed the loyal and patriotic toasts, gave a resume of the work done by the Master Builders' Association since its inauguration, which he said was due to the efforts of Messrs. W. Hadden, builder, and J. Davidson, plumber. Treasurer Martin proposed the "Architectural Profession." Mr. William Stuart, architect, responded. Mr. A. Scott, builder, proposed "The Public Boards." Bailie Wilson, in acknowledging, said the only burning question before the Town Council at present was the erection of an hospital, which they would be compelled to build whether they wanted to or not. Mr. W. Kennedy, quarry manager, Cruden, proposed "The Town and Trade." Councillor Ritchie responded. Other toasts followed.

NOTTING HILL ELECTRIC LIGHTING SCHEME.—At a meeting of the Kensington Borough Council recently, the Notting Hill electric lighting scheme was discussed. Under this scheme one of the electric supply companies seeks powers to acquire sites in Napier-road and Holland-news, Kensington, for the erection of works for generating or distributing electricity. The Law and General Purposes Committee were of opinion, considering the residential character of the district in which the selected sites were situated, that the scheme should be opposed by the Borough Council, unless the promoters would agree to the insertion of clauses in the Bill whereby the sites in question would not be used for generating stations, but be restricted to the purpose of storage and transferring stations. The Council decided to address a letter to the promoters intimating that, unless they were prepared to consent to the insertion of clauses as above, the Bill would be opposed by the Council.

WOOD-CUTTING MACHINERY.—Messrs. Glover & Co., of Leeds, whose circular saw guard was described and illustrated in our issue of August 25, 1900, have patented a machine for cutting up old and waste wood which may be saleable or useful for various purposes at a profit which cannot be ensured by the slower and more expensive process of labour. Their machine, in fact, deals with the whole process of cutting up wood, from the original tree to the handle of the saw. They state also that as very large knots can be split by their machine, knotty waste wood can be turned into the finest fire-wood, which cannot be so utilised or dealt with by hand.

CAPITAL AND LABOUR.

NORTHERN BUILDING TRADE DISPUTE.—At Leeds, on the 23rd ult., a conference was held between the Executive of the Northern Centre of the Building Federation and representatives of the London Order of Bricklayers in reference to the dispute at Newcastle. It is stated that the principle of arbitration was accepted by the men, but the conference closed without any understanding as to the arbitrator and the basis of arbitration being arrived at. A general lock-out in Yorkshire, Lancashire, and Cheshire is threatened unless the men furnish a definite reply on the points mentioned.—A general meeting of the members of the Newcastle, Gateshead, and Tyne District Master Builders' Association was held at the Building Trades Exchange, Newcastle, on the 29th ult. As the reply to the terms of arbitration offered by the Northern Centre of the Builders' Association to the operative bricklayers was not considered satisfactory, no decision was come to by the meeting. It is stated that the lock-out will now extend to Lancashire, Yorkshire, Cheshire, and the Isle of Man on February 2.

LEGAL.

IMPORTANT POINTS UNDER THE PUBLIC HEALTH ACT, 1875.

THE cases of the Mayor, &c., of Southend-on-Sea, *v.* Archer; and the same *v.* Romanis, came before a Divisional Court of King's Bench, composed of Justices Bruce and Phillimore on the 23rd ult., on two appeals by the town clerk of Southend from the decision of the justices of Southend dismissing informations preferred by him against both respondents for alleged contraventions of the by-laws in force within the borough with respect to new streets and buildings.

In the first case Archer was charged with unlawfully erecting a new building, *viz.*, a weighing machine house, without causing such building to be enclosed with walls constructed of good bricks, stone or other hard and incombustible materials, in alleged contravention of No. 11 of the by-laws of the borough. With regard to this case the material facts were these:—The structure in question was a house or shelter of a weighing-machine on the western esplanade where the public passed and stopped for the purpose of using the machine. The erection was made in sections and could be easily moved and was only used in the summer. It measured 10ft. 4 in. by 7 ft. (exclusive of projecting steps, 1 ft. 8 in. wide), with a height of 10 ft. in front and 8 ft. 6 in. at the rear. It consisted of wood framing, closely boarded with match-boarding on all four sides. It had an opening 7 ft. wide in front, open during business hours, but closed at night with wooden shutters and bolted. There was also a door on the east side which was locked at night. It had a wooden floor closely boarded and placed on sleepers or joists, the roof being constructed of wood, covered with felt. Inside was the machine, a table, two chairs, and some hat-pegs. The structure was not fixed to the soil, the only foundation being the wooden floor joists resting in the ground. There were no sanitary arrangements, and no provision for artificial lighting or heating. The structure was always closed at night, and no person remained on the premises. The appellant contended that the object of making by-laws under the Public Health Act, 1875, was to prevent the erection of wooden buildings or buildings of combustible materials in unfit situations, and that the structure in question was not an "exempted" building, and that it was a new building within the meaning of the by-laws. The respondent Archer contended that the structure was not a building or new building within the by-laws at all, and the justices upheld his contention and dismissed the information. The question for the Court now was whether the justices were right.

In the second case the structure in question was erected by the respondent Romanis on land in the borough on the sea front for the purpose of being used in the summer months for the sale of light refreshments. It was erected at the beginning of the season and taken down at the end, it being unfit in sections for the purpose. It measured 11 ft. 3 in. by 6 ft. 11 in., with a height of 7 ft. 5 in. It consisted of wood framing closely boarded with 1-inch match-boarding on all four sides. The front was movable and was taken down during business hours and closed and locked at night. It had a wooden floor and a roof of canvas fixed on wooden

cross-pieces and fastened down all round. Inside there was shelving and a counter, and goods on the shelves. There were no sanitary or drainage arrangements and no provision for artificial lighting or heating except an utensil for making hot water. The structure rested on the ground by its weight without being fixed to the soil, and had no foundation or chimney. The place was used as a shop for the sale of mineral-waters, tea, and so on, during the summer months, a person being employed there to serve customers. At night it was locked up, but nobody remained on the premises. The justices also held that the erection was not a new building within the meaning of the by-laws, and dismissed the information. The question also for the Court now was whether they were right in so holding.

Mr. Macmoran, K.C., and Mr. Herbert Smith appeared in support of the appeal. The respondents were not represented.

At the conclusion of the arguments of counsel, their lordships came to the conclusion that neither of the erections was a building within the Public Health Act, 1875, and the by-laws made thereunder, and dismissed both appeals.

RESPONSIBILITY FOR DRAINAGE WORK.

At the Clerkenwell County Court a few days ago, before his Honour, Judge Edge, judgment in the case of H. L. Markham, clerk, Leigh-court, Muswell Avenue, Muswell Hill, N., *v.* Charles W. Rook, builder, Muswell Avenue, Muswell Hill, was delivered. Judgment had been reserved, the plaintiff claiming *sl.* 13s. 6d., moneys paid by him to the Vestry of St. James and St. John, Clerkenwell, in respect of sewers, which moneys were payable by the defendant. The latter entered a counter-claim for 12l. 13s. 2d. for fittings supplied and work done for the plaintiff.

Mr. Davis was counsel for the plaintiff, and Mr. Gervans for the defendant.

The judge now reviewed the facts of the action, and said, as a matter of equity, no doubt the plaintiff would have to pay the outgoings from the time that he obtained possession, and the defendant would have to pay them up to the time that he gave possession to the plaintiff. It turned out that the plaintiff purchased the house on the representation made by the defendant, and he probably would not have purchased had he known that the paving and sewerage were not paid for. His first impression was that the plaintiff could recover, and that it was a misrepresentation on which the contract was based. But upon the perusal of the cases which had been cited to him, he had come to the opposite conclusion. He was quite clear that there was no fraud on the part of the defendant. The sewer had been put in some two years before the contract of sale was made, and no demand whatever of any kind had been made upon the defendant in relation to it. The case in question broadly laid it down that, although there was a contract in writing and a representation of certain things existing at the date of the contract, and it turned out afterwards that they did not exist, if the purchase was completed before any action was taken there was no remedy. The verdict would, therefore, be for the defendant, with costs on the claim, and for 6l. 4s. 6d. on the counter-claim, without costs.

"TUBE TREMORS."

MR. J. W. PENFOLD, F.S.I., sat as arbitrator, on the 29th ult., at the Surveyors' Institution in respect to a claim against the Central London Railway Company for injury done to No. 2, Lancaster-gate. The claimants were Lord Herschell and Mr. A. W. M. Baillie, acting as executors under the will of the late Mrs. Mary Conliffe.

Mr. C. A. Cripps, K.C., who appeared for the claimants, said that in consequence, it was believed, of the construction of the Central London Railway serious cracks began to appear at 2, Lancaster-gate, and there were indications that a serious subsidence was taking place. Owing to these disturbances, the tenant, Mrs. Hawkins, left, and the house now remained unoccupied. The owners claimed damages to the amount of 1,600l.

Mr. E. R. Robson, F.R.I.B.A., said he had inspected the house on May 17, 1899, and found a number of cracks in the walls and ceilings. They seemed to him to be caused by a general disturbance of the foundations, due, he should think, to the construction of the railway.

Mr. J. Bott, house agent, described the damage as seen by him on several recent visits. The first house, No. 1, which was nearer the line of the railway, showed even greater damage, and steel girders had had to be introduced into the hall. The cracks he imagined to have been caused by the construction of the railway, and now that the trains were working, the damaged houses were less able to stand the vibration.

Mr. Mark Judge, A.R.I.B.A., stated that he had inspected the house in June last year, and was of opinion that the damage was caused by the railway.

Mr. Freeman, for the defence, said this was the first practical claim for damage brought against the company, and they were prepared to submit a large body of evidence to back up the defence. It

was impossible from an engineering point of view that the damage could have been caused by the construction of the railway, which was 64 ft. below the surface of the road. The house, which was forty years old, had been built on the remains of a water-brook, and there still remained a large deposit of mud, with an unstable substratum. Moreover, the bursting of a water-main in 1897 had undermined the foundations, and it was quite possible that this was the cause of the damage.

The hearing was adjourned provisionally until February 8.

THE CENTRAL LONDON RAILWAY.

At the London Sheriff's Court, on Wednesday, before Mr. Under Sheriff Burchell and a special jury, the case of Purvis *v.* the Central London Railway Company came on for the assessment of damages. The claim was for 4,200l.

The case for the plaintiff, Dr. W. Laidlaw Purvis, of 20, Stafford-place, Oxford-street, was that his house, of which he held a perpetual lease from the City Corporation, had been damaged by the construction of the Central London Railway, the ground having subsided, thereby causing cracks in the outer walls. Expert evidence was called to prove that it would cost 2,200l. to carry out repairs, including the underpinning of the house, while 3,000l. was claimed for the depreciated value of the house, and 470l. for loss by reason of the tenants of the top and bottom floors having to leave while the repairs were executed. Dr. Purvis also claimed 1,000l. for inconvenience, damages to his practice as a consulting physician, consequent on his having to take other premises for a time, and for other incidental expenses. Witnesses stated that the work would take nine months to do.

For the defendants, expert witnesses stated that the necessary work could be done for 574l., and that the time occupied would not be more than fourteen weeks. The defendant company were willing to pay 1,120l.

In the result the jury awarded the plaintiff 1,500l., and judgment for this amount was entered.

ACTION BY AN ARCHITECT.

THE case of Green *v.* John Mason & Sons came before Mr. Justice Channell and a common jury in the King's Bench Division on the 29th and 30th ults. Mr. Marshall Hall, K.C., and Mr. Foa appeared as counsel for the plaintiff; and Mr. Duke, K.C., and Mr. Moyses for the defendants.

Mr. Foa, in opening the case, said this was an action by an architect and surveyor (of 10, Warwick-court, W.C.), who claimed the sum of 185l. from the defendants, who, he alleged, employed him in two capacities, first as architect in drawing and supervising the plans for the erection of certain buildings, and also as agent acting for them in selecting the site necessary for the purpose of buildings which the defendants intended to have erected. The larger portion of the sum claimed, *viz.*, four-fifths of the whole sum due, the plaintiff claimed in his capacity as architect. The defendants were brushmakers at Clerkenwell. Like a great many other firms who carried on business in large premises, they found it convenient to go into the country—that was to say, into a place which was not so crowded a district as Clerkenwell, but not too far from London. The defendants throughout these transactions were represented by a firm of solicitors.

At the time the story opened the solicitor was a Mr. Cowley, and this gentleman played an important part in the case. He shared chambers in Gray's Inn with the plaintiff, and knowing that the defendants wished to erect a factory, he placed the matter before Mr. Green. In March, 1899, Mr. Cowley told the plaintiff what the business was, and two days later Mr. Cowley, Mr. Mason, and the plaintiff had an interview. Mr. Mason then gave the plaintiff definite instructions to do certain preliminary drawings. An arrangement was also made that the plaintiff should go to the defendants' factory in Clerkenwell in order to study the requirements of Messrs. Mason. On April 6 the plaintiff, one of the defendants, and Mr. Cowley went to Willesden. The plaintiff, when he was first approached by Mr. Cowley, informed him that he thought he knew of some land which would just about suit the requirements of Messrs. Mason. A few days afterwards the plaintiff, having obtained from the vendor the price of the site, received definite instructions from defendants, through Mr. Cowley, to negotiate with the vendor for the sale of the land. Mr. Green offered, under the instructions of Mr. Cowley, 650l. in the first instance. That offer was refused by the vendor, but after further negotiation Mr. Green, under the instructions of Mr. Mason, offered 750l., and this offer was accepted by the vendor. Unfortunately, the vendor's solicitors were unable to put the thing through. The chief difficulty was this. At the present time, before a building could be put up in the London district, it was necessary to get a licence from the London County Council. The London County Council refused this licence until a certain bridge which spanned a canal in that neighbourhood had been widened. The bridge did not belong to the vendors but to the canal company, and the company refused to have the bridge widened. This

difficultly was never got over. To put the matter very shortly, after the amended offer had been made and accepted Mr. Green and the defendants thought the thing would go through, and Mr. Green was asked by the defendants to go on with his plans. Those were the amended plans, because the first plans were abandoned. In the autumn of 1899 the defendants were getting a little tired and pressed the plaintiff to get them a site somewhere else. The plaintiff undertook several journeys in the neighbourhood of London—Harrow, Finchley, and other places—but at the same time the defendants did not like to give up this site at Willesden, which they thought the most convenient for their requirements. In December matters had so far progressed that the plaintiff received definite instructions from the defendants to prepare the specifications. This was a very lengthy document. At the beginning of January last year, the defendants, finding that the site they would have liked to have presented so many difficulties, were advised to take a site on the same land at the other side of the bridge. The price of this site was 1,000*l.*, and defendants bought the land for that sum, and amended plans were prepared by the plaintiff on the instructions of the defendants. At the end of January, 1900, these plans were submitted to the defendants by the plaintiff. On January 31 the plaintiff received instructions from Mr. Mason to complete the plans in accordance with the amendments made by the latter, and to get out an estimate of the cost. It turned out afterwards that the defendants were not able to acquire that site. In February, 1900, a dispute of a serious kind broke out between Mr. Hanna (Mr. Cowley's partner) and Mr. Green, but with reference to matters not germane to the transactions in question. Mr. Green was told that he must settle the matter within seven days or it must be considered to be at an end. Mr. Green at this time had done all the work he was employed to do. Mr. Green then sent in his account to Messrs. Mason for services rendered. Messrs. Cowley & Hanna, on behalf of the defendants, denied liability to pay the account as rendered, stating that it was a condition that in the event of the plaintiff failing to negotiate for the sale of the land to the defendants, he should only charge the defendants with out-of-pocket expenses and disbursements and a merely nominal charge for his services. The plaintiff would tell them that he never made any such arrangement as that. The defence set up by the defendants was this. They said that although it was true plaintiff had done work for them, and that they had employed him as their architect, his being paid for his work was subject to the condition that the land should be acquired by defendants, and that as the land was not acquired that was sufficient to disentitle the plaintiff to charge anything except out-of-pocket expenses. The plaintiff denied this, and, said the learned counsel, it was extremely improbable that any architect would agree to any such thing. In conclusion, he stated that the plaintiff was suing on a *quantum meruit*. The plaintiff had to make out that his charges were fair and reasonable. Those charges were according to the scale as recognised by the Royal Institute of British Architects. The plans which the plaintiff had prepared were made under the direction of the defendants. Evidence would be called to prove that with slight adaptation the plans could be used on any site.

The plaintiff was then called, and gave evidence generally bearing out counsel's statement.

Cross-examined by Mr. Duke. He was a land agent, surveyor, and architect. He had ascertained particulars of the land at Willesden before he came into communication with the defendants. He made an agreement with Messrs. Roebottom, the agents for the vendors, that if he was able to dispose of the land he should share half of their 5 per cent. commission. He did not seek at any time to obtain anything in the nature of a double commission. He was an architect and surveyor.

Are you an architect? Yes.—I was articled for three years to a Mr. Richardson, and afterwards to a Mr. Allen, who was a Fellow of the Royal Institute of British Architects.

Did you make the plans in this case?—Not the actual plans submitted to Mason's. I assisted in making them. I did not actually prepare them. The witness in further cross-examination said, he did not draw all the specification but about one-half of it. Mr. Goss prepared the plans and the specification, but under the witness' supervision. Goss was paid 15*l.* for the plans and 3*l.* 5*s.* for preparing the specification. It was true that he asked the defendants to pay 160*l.* for the plans and specifications, but this sum included survey fees, interviews and correspondence, which was very voluminous.

Mr. Mason, when he saw the drawing which the witness had prepared, had not said witness was going to unnecessary expense and that if they (defendants) did not get the land they would not want the drawings. His instructions were to prepare plans of certain departments at certain dimensions. On June 8, 1899, there was a risk whether they would get the site at all. The matter was out of his hands so far as the contract was concerned. He could not say whether that was about the date when he put the matter into the hands of Goss to prepare plans for which he afterwards paid Goss 15*l.* 15*s.* He had known of architects preparing

plans of buildings without taking the levels of the site, or the correct measurement of the sites. He had never personally erected a factory, but he had been concerned during his articles in the erection of a number of warehouses.

Is it not a matter of common-sense that before you prepare plans for the erection of buildings you must find out what your levels will be?—It depends entirely upon the land. I took upon myself as the architect the full responsibility for the erection of the factory. The witness further stated that negotiations between Messrs. Mason and himself came absolutely to an end at the end of April. On April 28, witness told Goss to get on with the specification in order that the witness could complete his own specification. He subsequently received the specification from Goss. That work formed part of the work for which he claimed payment from the defendants.

Mr. F. R. Farrow, examined by Mr. Fox, said he was an architect and an F.R.I.B.A. If an architect prepared plans and specifications, it was in accordance with custom that he should be entitled to a certain fee on the estimated cost of the building. If the proposed building was not proceeded with the architect would be entitled to charge for the preparation of the plans and specification 2½ per cent. on the estimated cost of the building. This was in accordance with the rules of the Institute of British Architects. He had seen the specification and drawing in the present case. From these he considered that to erect a building as proposed would cost at least 6,000*l.*; 2½ per cent. on that would work out at 160*l.* It was not unusual for architects to employ another architect to prepare plans and specification, the latter being paid a fixed sum for doing the work.

Cross-examined. It was very usual for busy architects to do this, but not for young architects just commencing business. He had never heard of Mr. Allen or Mr. Richardson, to whom Mr. Green said he had been articled. He knew a Mr. Richardson, an auctioneer and surveyor, who lived at Finchley.

Other evidence having been given,

Mr. Duke, in opening the defendants' case, said that the plaintiff was told when defendants commenced negotiating with him, that all they could afford to spend on the erection of a factory to include the price of the land, was 5,000*l.* No doubt Masons would have allowed Mr. Green to draw the plans when the matter was ripe for that to be done, but their case was that that never happened. The defendants told Mr. Green that he must understand they did not intend to incur expense in the matter, and that they would not lay out more than 5,000*l.*, and that it was no good his going to expense until they were certain they were going to get the site. In answer to Mr. Mason, the plaintiff had said, "Oh, that is all right; these are only rough drawings, and if the site is not got it will not be any cost to you worth speaking about."

Mr. Arthur Mason, a member of the defendant firm, examined by Mr. Duke, said he had asked Mr. Green for a rough idea of the cost of the building, so that they might adapt it to their requirements. He told him they could not possibly exceed 5,000*l.* for the whole amount, including the land. Plaintiff said he could easily keep it down to that sum. In April plaintiff showed him a rough drawing by a Mr. Smith. Witness told him that it was different from what he wanted, and to run to no expense. Green replied that they were merely rough drawings in order to get at the cost of the building, but that they would cost nothing for professional services. Witness was subsequently shown plans drawn by Goss. Witness then said they were more like what they required, but inasmuch as the question of acquiring the site was hanging fire, he hoped he would incur no expense. Green assured him that no expense would be incurred until the site was acquired. There was no truth in the suggestion that the matter was withdrawn from the plaintiff because of his quarrel with Mr. Hanna.

Cross-examined by Mr. Fox. They had not paid the plaintiff anything. Witness had received Mr. Green's amended plans and kept them and studied them—at least the ground plan. He did not believe that his solicitor had instructed Mr. Green to get out specifications.

His lordship said it was plain from the correspondence that that was only intended to be done when the land was got.

Cross-examination continued. He agreed generally that the price of the land should not exceed 1,000*l.*

Mr. Hanna, examined by Mr. Duke, said he was a solicitor, one of the firm of the defendant's solicitors. He never told Mr. Green anything about getting out the specification. The thing never came to such a stage that a specification became necessary. Mr. Green was distinctly told that it was not necessary until the land was obtained.

Cross-examined by Mr. Fox. He had heard that a fresh site had been selected and the offer of 750*l.* increased to 1,000*l.* He had nothing to do with that personally.

Mr. Cowley, a member of the firm of solicitors representing the defendants, examined, said the plaintiff was told that the building, including cost of land, should not exceed 5,000*l.*—Plaintiff said it could easily be kept down to that. Witness told

Green repeatedly that it was no good going on with the plans until they had secured the land. He had never given Green specific instructions to prepare plans and specifications.

Mr. P. D. Smith, an architect, late student of the Royal Academy, Silver Medalist of the Royal Institute of British Architects, and Travelling Student of the Architectural Association, examined, said he had known plaintiff twenty years, but did not consider him an architect. He had prepared the plans mentioned, but had not yet been paid by Mr. Green anything for doing them.

Cross-examined. Did you had out Mr. Green's acquaintance in everything since that job?

Mr. Sidney George Goss, examined, said he was the gentleman who had prepared the plans produced. He was an A.R.I.B.A. Mr. Green was not an architect. Witness agreed to take a small fee because the plaintiff had told him that it was purely speculative work on his part. The plans were not sufficiently completed to enable a builder to build a factory from them. Witness could not complete them until the site was selected. The plans could not be carried out for less than 8,000*l.* or 9,000*l.*, and so he told Mr. Green when he took him the sketch plans.

Cross-examined by Mr. Fox: So long as Messrs. Masons obtained a site large enough, they could use the plans in question if they were amended. When an architect did such work as this for another architect, it was technically known in the profession as "taking in washing."

Other evidence having been given, the jury in the result returned a verdict for the plaintiff for 25*l.*, but inasmuch as the defendants had paid the amount into court in satisfaction of the plaintiff's claim, judgment was entered for the defendants with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

19,720.—KEYS FOR LOCKS: I. Dugmore.—The tail, which is made separately from the bolt-head, is fastened within a recess cut in the head. In the bolt is a hole through which passes a stump that is also made upon separate piece, of which the tail is slotted so that it may ride upon the fixed stump.

19,722.—BLOCKS FOR USE IN THE CONSTRUCTION OF CONDUITS, ARCHES, WELLS, SEWERS, &c.: D. T. Clegg & H. N. Brooke.—The vitrified blocks are hollow, and are shaped with dovetailed or under-cut grooves in their sides and outer faces, which will take cement. The blocks are also fashioned with interlocking end spigots and sockets.

19,756.—A MACHINE FOR SURFACING AND POLISHING MARBLE, GLASS, PORCELAIN, &c.: D. Gilles.—The machine for surfacing and polishing glass, marble, metal, and other plates is fitted with discs placed horizontally and forming two sets, each of which comprises a grinding-stone, an emery or some similar disc, and a buffing disc; the composite discs are mounted above the rails upon which the work-table is moved. The two sides of the plates are ground by the two sets of discs respectively. The discs can be adjusted vertically by means of a screw gear that secures them to their spindles. The rails can be similarly adjusted, and grinding-blocks may be substituted for the discs. The contrivance is described as being applicable for use with the frames of other glass-grinding machines, and for the grinding of lenses beneath stones fixed to the necessary curvature, the lenses being held stationary, the wheel.

19,781.—ELECTRICAL SWITCHES: S. A. Hunter.—For tumbler-switches one of the two projecting pieces upon the base separates the contacts and carries a support upon which the tumbler lever is mounted, to the other projecting piece is pivoted the movable contact-lever which has an insulated cross-bar and a connecting cross-piece; the cross-bar is pressed by the lever, which is so shaped that the contact-lever shall move quickly at first but more slowly afterwards; a quickbreak is effected by means of a spring, and a loop gives a positive movement.

19,813-4.—RADIATORS FOR THE HEATING OF BUILDINGS: F. A. Witmot.—For hot-water or steam-heating apparatus a wrought-metal radiator consists of pipes that are fitted into "headers" formed of sheet metal fashioned into shape, flanged sleeves, having inner sleeves and being bolted together, join the sections, which may be several in number, to one another. From the end of the radiator section projects a second flanged sleeve in which the steam or hot-water supply pipe is screwed. (19,814.) The radiator-pipes are secured in "headers" cupped and drawn from wrought metal, the edges of the blank in each case being closed in and fastened upon the "header's" outer face, whilst openings with collars are fashioned in the inner face to which the pipes are secured—confer No. 6,824 of 1897. The collars may either extend downwards or extend upwards, and so take the pipes around or within them.

19,861.—CONTROLLING VALVES FOR DOMESTIC SERVICE-PIPES: L. R. Smith and E. A. Gilbert.—A partition in which is an aperture controlled with a valve divides a cylinder into two parts; a valve and stem are mounted in a piston attached to the lower end of a hollow sliding tube, on to which the

former valve is fixed; when the latter valve is removed from its seat with a spring push-rod, the piston is forced downwards by the excess of pressure upon its upper side, and the flush thereupon is admitted through the valve in the dividing partition, but the piston will be raised again as the excess of pressure becomes transferred to act from underneath it by the closing of the push-rod valve, which is effected by means of the impact of an extension at the end of the rod against the bottom of the lower division of the cylinder.

19,881.—ROUGHENING OF GLASS SURFACES: A. J. Davis.—For roughening the surface of a finished sheet of glass in order that it may be cemented to walls, &c. The glass sheet is blown into the shape of a cylinder, and then split lengthwise. After being re-heated and flattened out, the inside of the split cylinder is coated with a composition of minium, silica, and calcium phosphate mixed with water, varnish, or oil, applied with a brush, and roughened with a grainer's tool.

19,921.—FACING-SLABS FOR BUILDERS' USE: Y. Bassett, leading on Bassett's Plaster Company.—The invention applies to the making of slabs for facing walls, partitions, ceilings, and so on. They are composed of pierced strips of scrap or waste metal, to be obtained from chain-making and similar works, which are embedded in a mass of coarse adamant plaster poured into a mould. When they have been nailed on to the wall or ceiling they can be plastered, painted, and decorated.

19,955.—A TAP FOR MIXING HOT AND COLD WATER SUPPLY: H. F. Adams.—In a combined hot and cold-water supply tap a screw-down valve regulates the outlet from a chamber of the casing, which is divided accordingly, the cold water supply pipe being connected with that chamber. An extension downwards of the spindle of the screw-down valve operates a lever which is pivoted beneath it, and is set in engagement with the spindle of a self-closing valve, by means of which the hot-water supply is furnished and regulated. The arrangement prevents that hot water only shall flow from the tap when the screw-down valve has been depressed so that it bears against its lower seating and thereby cuts off the supply of cold water.

19,956.—WRENCHES: A. A. Pearl.—A cam which is placed so as to press against the stem of the wrench and is formed upon the end of a handle which is pivoted to the movable jaw, serves to retain that jaw in a fixed position upon the stem. For an increase of the grip both the cam and that portion of the stem against which it bears should be toothed.

19,975.—A COWL FOR CHIMNEYS: W. Whitehead, T. Harris, and H. C. Sacré.—Gimbals or a Hooke's joint within a cup containing oil carry a cone-shaped cowl above the uptake of the chimney. In the case of an ordinary chimney-pot a bridge upon a short pipe fitted into the pot is employed as a mounting for the oil cup, and the cowl may have radially-curved vanes for its turning by the wind, the cowl being placed above a spindle made of metal. In the case of an archimedean screw, a similar arrangement set within an archimedean screw that form an india-rubber buffer ring is placed around the pipe at a level lower than that of the oil cup, and a conical baffle-ring is placed around the uptake just below its mouth.

20,004.—FLEXIBLE METALLIC TUBING: C. Rudolph.—The ends of the tubing which is after the kind specified in No. 6478 of 1885, have protective and heat pieces to be brazed, soldered, or welded together, or they may be joined by means of rolled strips in such a manner that, whilst the thicker ends are left, the middle part becomes thinned; the tubing is composed of the ends of channelled metallic strips which are wound around in the manner of a helix.

20,028.—GAUGES: H. Brooker and A. J. Baxter.—A toothed disc which works within a casing is set in gear with the threads of a spindle, various gauge-scales of known kinds, with a decimal scale for plates and wires, are marked upon the disc, and there is provided a vernier-scale for very fine adjustments; the scales can be read through openings cut through the casing; in some instances the disc may be advantageously replaced with a travelling rack-bar.

20,038.—FEED-WATER APPARATUS: T. J. Whitney.—Upon the main boiler is mounted a supplementary boiler, wherein the supply of hot water is kept up by the admission of exhaust steam. Inside the auxiliary boiler is placed a feed-heating chamber, into which water enters through a five-way disc or plug-valve. The reversal of the valve arrests the flow of the feed-water, and the heater is thereupon brought into communication with the boiler, both above and below the water-level, by means of pipes, the water flowing through its own gravity into the boiler. A spindle and a cross-arm in engagement with notches work the spindle.

20,048.—MANUFACTURE OF ACETYLENE: H. J. Rogers.—A hanging pocket, having a cover, is fitted within an ordinary gas-holder bell, the carbide is laid upon trays disposed in the pocket, and the supply of water is regulated by a cock of which the handle can be moved over the face of a dial affixed outside the bell; the resultant gas flows through a cock so as to lift up the bell and at the same time to cut off the water supply. The cock can be turned from without the bell; the position of a ratchet wheel, which is engaged by a pawl upon the gas-holder, will indicate when the top tray of carbide has

been exhausted, then the two cocks are turned off and the trays can be re-charged whilst a supply of gas remains in the holder; a coil and pipe are provided for the flow of the gas into a purifier charged with oxide of iron or lime, or with lime and oxide of iron together.

MEETINGS.

FRIDAY, FEBRUARY 1.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Mechanical Physics, Laws of Motion, Hydraulics, &c." 7 p.m.
Royal Institution.—The Rt. Rev. Monsignor G. Molloy, D.S.C., on "Electric Waves." 9 p.m.
Architectural Association of Ireland (Technical Demonstrations).—Mr. E. A. Phillipson on Electricity, &c. (at 10, Lower Baggot-street). 4.20 p.m.

SATURDAY, FEBRUARY 2.

British Institute of Certified Carpenters.—Monthly meeting, Carpenters' Hall. 6 p.m.

MONDAY, FEBRUARY 4.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." 111. 4 p.m.
Society of Arts (Cantor Lectures).—Mr. J. Liberty on "Elementary Art Education." IV. 8 p.m.
Institution of Engineers.—The President for the past year, Mr. Henry O'Connor, will present the premiums awarded for papers read during the year. 2. The President for the year 1901, Mr. Charles Mason, will deliver his inaugural address. 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "Natural Forces: Light, Heat, Electricity, and Chemistry." 8 p.m.
Leeds and Yorkshire Architectural Society.—Mr. F. Rowntree on "Domestic Work." 6.30 p.m.
Liverpool Architectural Society.—1. Election of members and the election of a joint honorary secretary in place of Mr. F. E. P. Edwards, resigned. The council nominate Mr. C. Hastwell Grayson, M.A., A.R.I.P.A. 2. To consider and approve a draft memorandum and articles of association in connexion with the proposed incorporation of the society, which has been prepared by the council in accordance with the resolution passed at the last annual general meeting. 6 p.m.

TUESDAY, FEBRUARY 5.

Royal Institution.—Professor J. A. Ewing, M.A., F.R.S., on "Practical Mechanics (experimentally treated). First Principles and Modern Illustrations." IV. 3 p.m.
Institution of Junior Engineers.—Mr. A. H. Barker, R.A., F.S.E., on "Works Management." I. 8 p.m. (at Westminster Palace Hotel, Victoria-st., S.W.).
Royal Photographic Society.—Mr. Ernest Marriage on "Romanesque Architecture." Illustrated by his own slides. 8 p.m.
City of London College Science Society.—Visit to the Colonial Consignment and Distributing Company's stock stores, Nelson Wharf, Commercial, Lambeth, S.E. 2.45 p.m.

WEDNESDAY, FEBRUARY 6.

Royal Archaeological Institute of Great Britain and Ireland.—Professor T. McHenry Hughes, M.A., F.R.S., on "The Natural Forms Which Have Suggested Some of the Commonest Implements of Stone, Bone, and Wood." Dr. S. Russell, F.R.S., on "Recent Excavations in the Forum at Rome." 4 p.m.
Society of Arts.—Mr. Joseph Pennell on "Some Experiences of Motor Bicycles." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. J. Steegmann on "The Atmosphere: Pressure and Composition. Air: Combustion and Respiration." 8 p.m.
Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the members. 8 p.m.
Architectural Association of Ireland (Technical Demonstrations).—Mr. R. A. Wood on "Luxfer Prisms and Pismatic Lighting: Theory and Application." 7.30 p.m.

THURSDAY, FEBRUARY 7.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." IV. 4 p.m.
Civil and Mechanical Engineers' Society.—Mr. M. Lawson on "The Staines Reservoir Works." 8 p.m.

FRIDAY, FEBRUARY 8.

Architectural Association.—Mr. D. T. Fyfe on "Cretan Architecture." 7.30 p.m.
Royal Institution.—Professor G. H. Bryan on "History and Progress of Aerial Locomotion." 9 p.m.
The Institution of Junior Engineers (Westminster Palace Hotel).—Mr. Louis F. Awde on "Electric Power Supply in the Metropolis." 8 p.m.
Institution of Mechanical Engineers.—Adjourned discussion on the following paper:—"Power-gas and Large Gas-engines for Central Stations," by Mr. Herbert A. Humphrey. 8 p.m.

Glasgow Architectural Craftmen's Society.—"Wall Coverings." Mr. C. Sinclair on "Limes," Mr. R. W. Horn on "Cements," and Mr. J. Arthur on "Patent Plasters." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Marriott on "Meteorology." 8 p.m.
Architectural Association of Ireland (Technical Demonstrations).—Mr. J. T. Keatinge on "Painting, Varnish, Wall-papers, &c. (42, Grafton-st., Dublin)." 4.30 p.m.

SATURDAY, FEBRUARY 9.

Builders' Foremen's Association.—Annual Dinner, King's Hall, Harbour Restaurant.
Dundee Institute of Architecture.—Mr. J. D. Mills on "Warwick and Staffordshire Architecture." 7 p.m.
Edinburgh Architectural Association.—Visit to Royal High School, Canongate Parish Church, and Old Tolbooth.

SOME RECENT SALES OF PROPERTY:

Table with 2 columns: Description of property and Sale price. Includes entries like 'January 18.—By A. J. SHEFFIELD. Poplar.—223, East India Dock-rd., f., r. 80l. ... £1,300' and 'Commercial-road East.—Nos. 243, 245, 247, 261, and 367, ut. 13 1/2 and 3 1/2 yrs., g.t. 220l., r. 384l. 175s. ... 380'

Table of property sales with columns for location, description, and price. Includes entries like '14A, 14, 16, 18, and 20, Philpot-st., ut. 1 1/2 yrs., g.t. 150l. ... £410' and '14A, 14, 16, 18, and 20, Philpot-st., ut. 1 1/2 yrs., g.t. 150l. ... 175'

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table of material prices with columns for material name and price. Includes entries like 'BRICKS, &c. £ s. d. Hard Stocks ... 1 16 0 per 1,000 alongside, in river.' and 'Best White and Ivory-Glazed Stretchers ... 13 0 0'

See also next page.

CONTRACTS AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

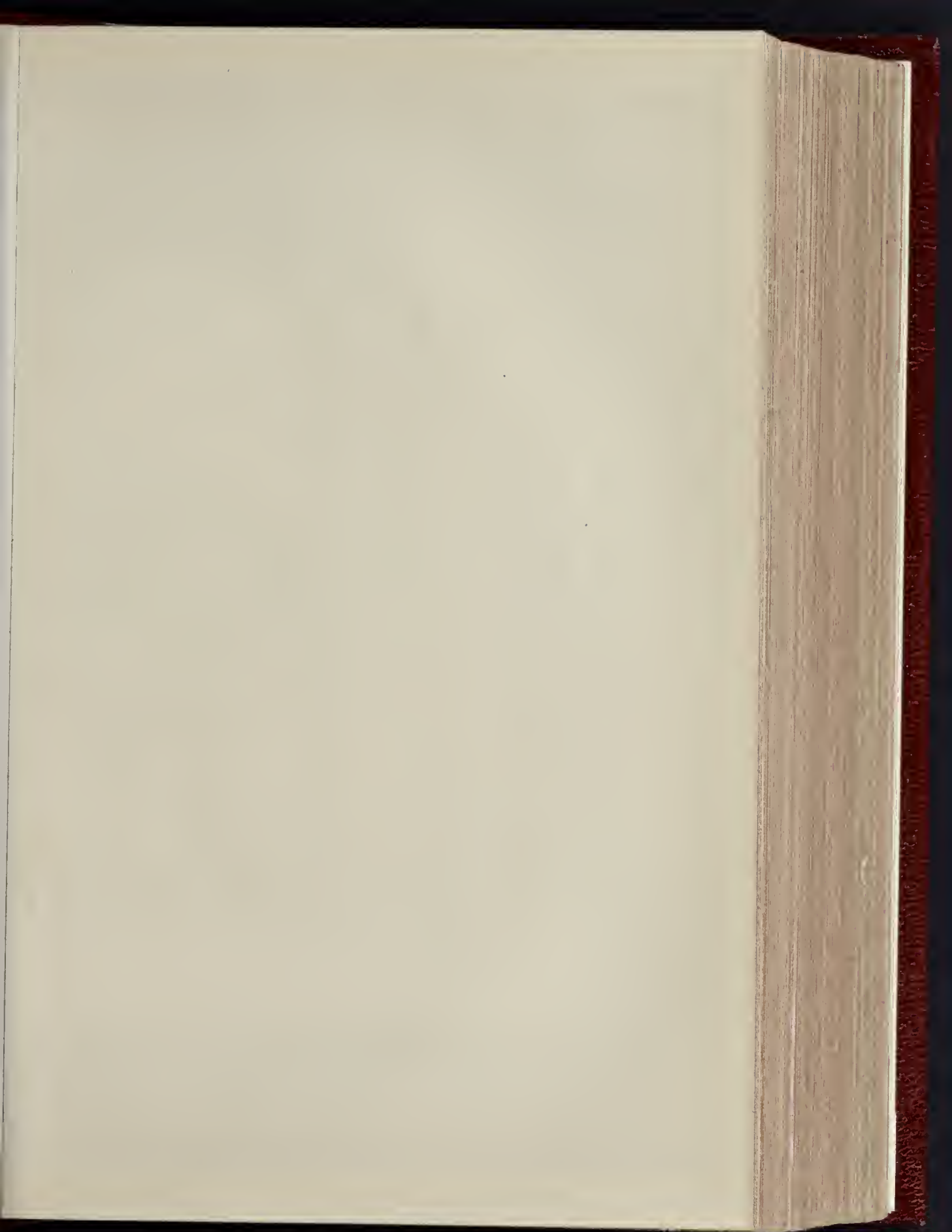
Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Two Boilers, &c.	Great Yarmouth Corporation	J. W. Cockrill, Civil Engineer, Town Hall, Great Yarmouth	Feb. 5
Warehouse, Dundalk	Great Northern Ry. Co. (Ireland)	T. Morrison, Amiens-street, Dublin	do.
Several Cottages, Sutton, Ireland	do.	do.	do.
Mason's Work, Akroyd Park	Hullfax Corporation	J. Lord, Civil Engineer, Town Hall, Halifax	Feb. 6
Schools, Britannia-road, Banbury	do.	Rev. J. E. Pater, The Green, Banbury	do.
Alterations to Manor House, Barnsley	do.	J. W. Cockrill, Civil Engineer, Town Hall, Great Yarmouth	do.
Steel Driveway Rails	Great Yarmouth Corporation	W. Reid, Civil Engineer, Saltoun-square, Fraserburgh	do.
Villa, Grattan-place, Fraserburgh, N.B.	Mr. A. Gordon	W. Stewart, Inverurie	do.
Steading, Kinghorn, N.B.	do.	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Additions to School, Knowl Bank	Golcar (Yorks) School Board	City Engineer, St. Mary's Hall, Coventry	Feb. 7
Fire Station, &c., Park-avenue, Barnsley	Coventry Corporation	Senior & Clegg, Architects, Regent-street, Barnsley	do.
Four Houses, &c., Park-avenue, Barnsley	do.	J. A. Seward, Architect, 11A, Flahergate, Preston	do.
Hospital, Fulwood, near Preston	do.	Wilson & Duffus, Aberdeen	do.
Farm Buildings, Thistley Hill, near Udry, N.B.	Fernhurst School Board	J. Hill, School Board Offices, Fernhurst	Feb. 8
Schools	Lanark County Council	W. L. Douglass, Civil Engineer, 3, Clydesdale-street, Hamilton	do.
Pipe Sewers (2 1/2 miles), Blandyre	do.	Austin & Paley, Architects, Lancaster	do.
Church, near Rawtenstall, Lancs	Chesham (Bucks) U.D.C.	Taylor & Co., Civil Engineers, 27, Great George-street, S.W.	do.
Waterworks	do.	J. B. Colson, Architect, 45, Levy-street, Winchester	Feb. 9
Masonry Work, St. Thomas Church, Newport, I. of W.	do.	Johnstone Bros., Architects, 39, Lowther-street, Carlisle	do.
Building Work, Congregational Church, Carlisle	do.	C. G. Baker, Architect, Great Yarmouth	do.
Additions to St. Gordon's, Southtown, Gt. Yarmouth	do.	W. H. Bosker, Rhabon-road, Wrexham	do.
Six Houses, Hampden-street, Newtown, Wrexham	do.	E. J. Toye, Architect, Strand, Londonderry	do.
Additions to Nazareth House, Londonderry	do.	J. B. Morgan, Architect, School Board Offices, Llanelli	Feb. 11
School, &c., Park-avenue, Barnsley	Llanelli School Board	J. Fularton, Campbelltown	do.
Waterworks	Whitby U.D.C. Corporation	R. L. Roberts, Architect, Victoria Chambers, Abercrombie	do.
School, Aberbeeg, Mon.	Aberystwith School Board	H. Shaw, Surveyor, 7, Granbrook-road, Ilford	Feb. 12
* Pavilion	Ilford U.D.C.	do.	do.
Additions to Chapel, Tonyrefail, Glam	do.	C. Morse, High-street, Tonyrefail	do.
Additions to Workhouse, &c.	Mount Bellew (Ireland) Guardians	J. Smith, Architect, Ballinacloe	do.
* Electric Light Station	Whitby U.D.C.	Clerk, Council Offices, Whitby, Yorks	do.
* Supplies, &c.	West Ham Borough Council	Surveyor's Department, Town Hall, Catford, S.E.	do.
* Kerbing and Tarpaving, &c., Weald-road	Lewisham Borough Council	do.	do.
* Kerbing and Tarpaving, &c., Treviso-road	do.	do.	do.
* Kerbing and Tarpaving, &c., Kemble-road	do.	do.	do.
* Kerbing and Tarpaving, &c., Vestris-road	do.	do.	do.
* Works and Materials	Willesden District Council	Engineer, Council Offices, Dyne-road, Kilburn, N.W.	do.
* Cleansing and Watering Roads, &c.	Crowe Estate Paving Commrs	Lodge, Park Square West, Regent's Park	Feb. 13
* Fitting up Kitchen Department	Metropolitan Asylums Board	Office, Embankment, E.C.	do.
* Foundations	do.	do.	do.
Shops, &c., near Durham	Annfield Plain Indus. Co-op. Soc.	G. T. Wilson, Architect, 121, Durham-road, Blackhill	Feb. 16
* Infirmary	Kingston Union	C. T. Delosse, Architect, Duke-street, Kingston	Feb. 18
* Painting, &c.	Metropolitan Asylums Board	Offices, Embankment, E.C.	do.
* Sewering, Draining, &c.	Hendon U.D.C.	Engineer, Public Office, Hendon, N.W.	do.
* Materials, &c.	do.	do.	do.
* Alterations to Roof, &c.	Shoreditch Borough Council	Borough Engineer, Town Hall, Old-street, E.C.	Feb. 19
* Alterations to Southern Portion of Holton Bridge	Heading R.D.C.	See Advertisement	do.
* Iron Staircases	Walsley Asylum Committee	See Advertisement	Feb. 20
* Car Sheds, Stores, &c.	Walsley U.D.C.	J. H. Crowther, Engineer, Great Float, near Birkenhead	Feb. 21
* Engine and Pump House	do.	do.	do.
* Administrative Block at Workhouse Infirmary	Sheffield Guardians	Union Offices, Westbar, Sheffield	Feb. 25
* Tanks, Filters, &c.	Wanslet U.D.C.	Council Offices, Wanslet, N.E.	do.
* School Buildings	Wrexham County Schools	See Advertisement	do.
* Shops, &c.	Walthamstow Parochial Charities	W. A. Longmore, Archt., Bridge Chambers, Hoe-st., Walthamstow	do.
* Hotel at Felixstowe, Suffolk	Hon. Douglas A. Tollemache	See Advertisement	Mar. 4
* Works and Materials	Hornsey U.D.C.	Engineer, Council Offices, Southwood-lane, Highgate, N.	do.
* Extension and Completion of Infirmary	Camberwell Guardians	See Advertisement	Mar. 13
* Post Office, Castleford	do.	Garside & Pennington, Architects, Pontefract	No date
* School Buildings, Dalkeith	do.	T. Sturrock, Dalkeith	do.
* Additions to Hotel, Dove Dale, Derbyshire	Messrs. Evershed, Limited	Garlick & Flint, Architects, Buxton	do.
* Bank Premises, Dunmurry, Ireland	Munster & Leiner Bank	A. Hill, Architect, 22, George's-street, Cork	do.
* Three Houses and Shop, Featherstone, Yorks	Mr. J. Walker	W. H. Fearnley, Architect, Featherstone	do.
* Bakery, Warehouse, &c., Caroline-place, Hull	do.	Freeman & Co., Architects, 11, Carr-lane, Hull	do.
* Building Work, 47 and 51, Highgate, Kendal	do.	J. Salkner, Architect, Kendal	do.
* Excavations for Warehouse, Wellington-street, Leeds	Messrs. Crone & Co., Limited	Gordon & Jones, Architects, 25, Coleridge-street, Leeds	do.
* Offices and Playground, Moston, Manchester	do.	S. M. Chadwick, Architect, Chapel Walks, Manchester	do.
* Iron Staircases at Workhouse, Withington	Chorlton Union Guardians	J. B. Broadbent, Architect, 15, Cooper-street, Manchester	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
* Clerk of Works	Manchester School Board	3l. 3s. per week	Feb. 9
* Chief Assistant	Richmond Town Council	150l. per annum	Feb. 14
* Draughtsman	Hackney Borough Council	2l. 2s. per week	Feb. 15

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xviii. & xxi

PRICES CURRENT (Continued).		PRICES CURRENT (Continued).		PRICES CURRENT (Continued).	
BRICKS, &c.		L s. d.		STONE.	
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Headers 12 0 0	per 1,000 at railway depot.	One Side and two Ends 15 0 0	per 1,000 at railway depot.	Ancaster in blocks 2 0	per ft. cube, deliv. rly. depd
Quoins, Bullnose, and Flats 17 0 0	" " " "	Two Sides and one End 15 0 0	" " " "	Bath " " " " 1 7	" " " "
Double Stretchers 12 0 0	" " " "	Splays, Chamfered, Squights 14 0 0	" " " "	Farleigh Down Bath " " " " 1 3	" " " "
Double Headers 16 0 0	" " " "	Seconds Quaily White and Dipped Salt Glazed 2 0 0	" " " "	Beer " in blocks 1 6 1/2	" " " "
One Side and two Ends 19 0 0	" " " "	Thames and Pit Sand 8 0	per yard, delivered.	Grinshill " " " " 1 10	" " " "
Two Sides and one End 20 0 0	" " " "	Thames Ballast 6 9 1/2	" " " "	Brown Portland in blocks 2 2	" " " "
Splays, Chamfered, Squights 20 0 0	" " " "	Best Portland Cement 3 0	per ton	Dacey Dale in blocks 2 1 1/2	" " " "
Best Dipped Salt Glazed Stretchers and Headers 22 0 0	" " " "	Best Portland Blue Lias Lime 25 6	" " " "	Red Corshill " " " " 2 5	" " " "
Quoins, Bullnose, and Flats 14 0 0	" " " "	NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.		Red Mansfield " " " " 2 4 1/2	" " " "
Double Stretchers 13 0 0	" " " "	Grey Stone Lime 13s. 6d.	per yard, delivered.	Hard York in blocks 2 10	" " " "
Double Headers 14 0 0	" " " "	Stonbridge Fire-clay in sacks, 72s. 6d.	per ton at rly. dep.	Hard York 6 in. sawn both sides	" " " "
				handings, 10 sizes (under 40 ft. sup.) 2 5	per ft. super. at rly. depd.
				6 in. Rubbed Ditto 3 0	" " " "
				3 in. sawn both sides slabs (random sizes) 1 3	" " " "
				3 in. self-faced Ditto 0 9 1/2	" " " "





INTERIOR VIEW
(IN ILLUSTRATION OF PROFESSOR AIT)



ST. PETER'S.
(FOR THE ROYAL ACADEMY LECTURES.)

INK PHOTO. SPRINGUE & CO. LTD. 4 & 5, EAST HAIDING STREET, LONDON, E.C.

PRICES CURRENT (Continued). SLATES.

Table listing slate prices with columns for quantity, size, and price per 1000 or 2000 at ry. depot.

TILES.

Table listing tile prices for various types like plain red roofing, hip and valley, and mosaic.

WOOD. BUILDING WOOD.—YELLOW.

Table listing building wood prices for yellow pine, including various sizes and quantities.

JOINERS' WOOD.

Table listing joiners' wood prices for items like white sea, yellow deals, and various sizes of battens.

JOISTS, GIRDERS, &c.

Table listing joists and girders prices, including London and delivered rates.

PRICES CURRENT (Continued). METALS.

Table listing metal prices for iron, steel, zinc, and copper, including various grades and quantities.

ENGLISH SHEET GLASS IN CRATES.

Table listing English sheet glass prices in crates for various thicknesses.

OILS, &c.

Table listing oil prices for raw linseed, boiled, and turpentine.

VARNISHES, &c.

Table listing varnish prices for different types like elastic copal and hard copal.

TO CORRESPONDENTS.

Notice regarding correspondence, signed articles, and the responsibility of authors.

Notice regarding the return of rejected communications.

Notice regarding the decline of pointing out books and giving addresses.

Notice regarding the approval of articles and the receipt of proof of an article.

TENDERS.

General notice regarding tenders for insertion, including requirements for authentication and payment.

ARBROATH.—For the erection of a hospital for the Burgh of Arbroath and the Arbroath district of the county of Forfar.

BELVEDERE (Kent).—For proposed Board offices, &c., and cookery centre at Picardy Schools, Belvedere.

WOODWARD & CO.—Board offices, pupil teachers, attendants, Cookery and waiting centre, schools, by rooms &c.

FALMOUTH.—For the erection of police station, &c., for the Standing Joint Committee.

HEAMOR (Cornwall).—For the erection of school buildings for the Madron School Board.

KILLARNEY (Ireland).—For the erection of lodging houses (exclusive of making roads, footpaths, main drainage, and main water pipes).

KINGSTON-ON-THAMES.—For the erection of additions to laundry and coal stores at the Kingston Workhouse.

LEICESTER.—For the erection of offices, &c., St. James's and Earl-streets, for the National Union of Boot and Shoe Operatives.

LEIGH-ON-SEA.—For making-up, kerbing, channeling, and paving roads at Leigh-on-Sea.

Table listing lowest tenders for various locations like Leighville-grove, Southsea-avenue, and Lynton-avenue.

LONDON.—For the erection of new branch library at Highgate, for the Hornsey Urban District Council.

PEMBERTON (Lancs.).—For building generating station and tall chimney, for Pemberton Urban District Council:—
 Wm. France .. £4,390 0 0 | T. & H. Houghton, Warrington, 4/288 0 0
 Johnson & Son .. 4,288 0 0 | ton, New-
 A. Bywater .. 4,288 0 0 | town Pem-
 W. Wignall .. 4,286 0 0 | berton ..
 David A. Ablett .. 3,914 0 0 | ton* .. £3,694 0 0
 Alex. Wigan .. 3,870 0 0 | Wilson & Co. .. 2,585 0 0

PEMBERTON (Lancs.).—For paving and kerbing Harriet-place, Ormskirk-road, for the Urban District Council:—

	Paving Per sq. d.	Kerbing. Per lin. yard.
Robert Bradley	7 1/2	7 1/2
John T. Peet	7	4
Thomas Nixon	6	3
Joshua Bradley	4 1/2	3
James Bratherton, Newtown, Pem- berton*	4 1/2	3 1/2

ROCHFORD (Essex).—For erecting an isolation hospital, Sutton Ford Bridge, for the Rochford District Council. Messrs. C. & W. H. Pertwee, architects, Chelmsford:—

Foster Bros.	£5,169	Davis & Leaney ..	£4,028
Gibb & Co.	4,800	Hammond & Son ..	3,980
Smith & Son	4,669	Dupont & Co.	3,987
A. W. Robins	4,598	T. H. Coleman	3,945
Silas Parmenter	4,500	F. & E. Davey	3,887
Enness Bros.	4,493	Coulson & Lotts ..	3,888
Snewin Bros.	4,464	W. E. Davey	3,820
West Bros.	4,430	S. Norden, Rochford, Essex	3,810
E. West	4,242	Harris & Rowe	3,724
Jno. Rayner	4,078		

SALTASH (Cornwall).—For repairing roads, boundary walls, &c., on the Port View Estate, for the trustees. Mr. Edgar M. Leest, surveyor, Devonport and Saltash:—
 W. Blake .. £857 0 0 | Taylor & Minton, £375 15 0
 J. Coles .. 528 2 5 | W. C. Shaddock,
 W. H. Rothery 415 0 0 | Plymouth .. £337 2 8

STOKE-UPON-TRENT.—For the erection of a laundry and boiler-house at workshop, for the Guardians. Mr. C. Lyman, architect, Stoke-upon-Trent:—
 H. P. Embry & Co. £5,013 | T. Godwin .. £5,557
 J. Bagrall .. 5,845 | T. R. Yoxall, Stoke-
 Melkejohn & Son .. 5,795 | on-Trent .. 5,443

SURBITON.—For the erection of mortuary, Alpha-road; and (2) road works, Toworthy, &c., Surbiton-hill, for the Urban District Council. Mr. S. Mather, surveyor, Council Offices, Surbiton:—

Mortuary.
 E. Tomkinson .. £798 0 0 | W. Hobern .. £609 0 0
 McDonald Bros. 733 0 0 | J. Pavey .. 598 0 0
 Higby & Rabson 674 12 0 | G. Merredew .. 598 0 0
 Surveyor's estimate .. £617 2 0

Making-up Roads.
 R. M. Parkin .. £2,598 0 0 | Thos. Adams .. £2,557 9 8
 son .. 2,170 0 0 | S. Atkins .. 1,844 0 0
 Cliff Ford .. 2,170 0 0 | J. Nicholas .. 1,751 16 0
 Fry Bros. .. 2,168 16 8 | S. Kavanagh,
 Frez & Sons .. 2,088 15 2 | Surbiton* .. 1,610 4 9
 Surveyor's estimate .. £1,699 2 1

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URMSTON (Lancs.).—For the erection of a girder bridge over Ouzel Brook, for the Moss Side Urban District Council. Mr. H. B. Longley, Engineer, Council Offices, Moss Side, Manchester:—
 Wootton & Sons, Moss Side, Manchester. £144 14 3
 The lowest of five tenders received.

LONDON SCHOOL BOARD TENDERS.
 At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

HIGHWAY GRADED SCHOOL (St. George's-in-the-East).—For sanitary and drainage works:—
 Monday & Johnson & Co. Ltd. £3,428 0 0
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 Martin Wells & Co. .. 3,053 0 0
 Killingback & Stevens Bros. .. 2,942 0 0
 Stevens Bros. .. 2,874 15 4
 Ashby & Horner* .. 2,499 0 0

GLOBE-TERRACE SCHOOL (Bethnal Green).—For sanitary and drainage works:—
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 Martin Wells & Co. .. 2,917 0 0
 Killingback & Stevens Bros. .. 2,928 0 0
 Stevens Bros. .. 2,775 0 0
 Willmott & Sons .. 2,694 0 0
 Lawrence & Sons .. 2,591 0 0
 Johnson & Co. .. 2,526 0 0
 Williams & Son .. 2,495 0 0
 F. Bull* .. 2,359 0 0

HEAD OFFICES OF THE BOARD.—Repairs to heating apparatus in Evening Continuation Schools Department:—
 Brightside Foundry and Engineering Co., Limited. £76 0 0
 J. Wootton-Smith, Gray & Co. .. 62 10 0
 John Esson .. 19 10 | Gray & Co. .. 61 10 0

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VOL. LXXX.—No. 3027.

FEBRUARY 9, 1907.

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The Courtyard of the Archbishop's Palace, Milan; and one of the Towers of the Castle (as restored under Signor Moretti).....	Double-Page Ink-Photo.
Design for an Entrance Gateway to a Public Park (Royal Institute of British Architects' Tite Prize, 1901; Second Prize).— By Mr. Ralph Knott.....	Two Double-Page Photo-Liths.

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Some Cities of Modern Italy—Milan.



MILAN is the most important commercial city in Italy, and perhaps in that sense it may be looked upon as the veritable capital of the new kingdom. But with the large influx of foreign residents

during the last quarter of a century, a great deal of its national character is disappearing, and it is becoming a cosmopolitan and consequently uninteresting town. Its modern streets, lined with brass-plated doorways and plate-glass fronted shops, with an endless variety of foreign names inscribed, remind one of any other ordinary European capital. In Naples, Rome, or Florence the huge modern palaces are still constructed in the old manner, their ground-floors honey-combed with quaint little shops, amongst which the *portone*, or principal entrance of the palace, affords entrance into the invariable spacious courtyard. But in Milan the ground has become too valuable of recent years, and economical planning is practised as much as in London. Old local characteristics, which give so much interest to ordinary Italian towns, carried on as they often have been through the nineteenth century, are now quite abandoned in the modern buildings, and with this abandonment the architectural aspect of the city has fallen to a very low level. It is true that the Victor Emmanuel Gallery, a species of gigantic Burlington Arcade, with transepts, built by an Anglo-Italian company forty years ago, may be considered to have a unique and local modern character. It is on a grander scale than anything of the kind elsewhere, but its architecture is of the very poorest description, and it can hardly be considered to compensate for the disappearance of the long-drawn mediæval arcades and grand old palaces, which must have formerly occupied its site, and the centre of the

ancient city. This "Galleria" is, at the present time, in course of "restoration," after only forty years of existence. Illustrations of it will be found in a very long ago number of the *Builder* of contemporary date.

The development of the city since 1860 has been enormous, and to a great extent unprepared for. The *actovi* limit has recently been extended to embrace more than double the space of twenty-five years ago. The value of property has risen to such an extent that a benevolent society, instituted to provide dwellings for the poor turned out of their homes by the alterations of those days, and which built a considerable modern quarter of the town for that purpose, is now receiving 50 per cent. more income than the shareholders are permitted to accept in accordance with their rules. The unfortunate society is embarrassed with its riches, and a difficulty has arisen as to the disposal of the ever-increasing surplus.

Although not so early in the field of modern development as Florence, Milan was perhaps the first of the Italian cities to make a clean sweep of many filthy lanes and dilapidated houses which blocked up its centre before 1860. But, alas! in the progress of "sventramento" and "risanamento" almost every trace of mediæval architecture, excepting the little group of buildings surrounding the Piazza dei Mercanti, has disappeared. Hardly another city of Italy has suffered so severely. This drastic measure may have been necessary, but it has destroyed all artistic interest in a famous old European city, the theatre of great historical events.

A few over-restored old churches, once suburban, now enveloped in districts of modern houses, are the only mediæval monuments left to recall its ancient history. The Sforza and Visconti have long ago faded into oblivion, as far as monuments are concerned; their few memorials are very hard to find; and such few buildings as survive, which can at all be associated with them, have been rebuilt and restored beyond recognition. Milan appears to have suffered

from a careless destruction of ancient monuments at the time of its great development in 1860. Before the "Unity of Italy," the city was an ordinary, old-fashioned provincial capital, where the local aristocratic families resided in their ancestral palaces, in old Italian patriarchal fashion. But the times and also the manner of living have changed since then. A flood of modern speculation and commercial activity has swept away the old social order and mode of existence, and the palaces, abandoned by their owners, who now live either on their country estates or in modern suburban villas, are tenanted as houses of business, or, still harder fate, have become commercial hotels. Most of these old palaces, situated in what were once suburbs, and which have consequently escaped the "sventramento," are of a very pronounced *barocco* style. One of the largest, the Palazzo Litta, on the west side of the city, covering acres of ground, and with a long front of poor seventeenth-century design, is now turned into the central railway administration, a kind of use for which such buildings serve very well. The gardens of the old palaces have in all cases, of course, been transformed into sites for the new tenement houses.

The new suburbs of Milan are in the highest degree depressing and uninviting. They consist, with only one exception, of factory districts, with their accompanying slums of workmen's dwellings, which even an Italian sun fails to redeem from the most sordid and miserable aspect. A fashionable quarter has sprung up within the last few years, surrounding the remains of the mediæval castle, to accommodate the *nouveau riche* class of speculators and bankers, which directs the modern life of the city. The houses in this district are the usual six-storied Parisian tenement-palaces, in which luxury, combined with economy of space, are ruling features. Planted boulevards, pretentious shops, and, in some places, the "maisonette" type of property, give the effect of a French or German town. The buildings are terribly commonplace in their

design, and utterly uninteresting, although built of very costly materials and loaded with ornament. In one or two cases "Mansard" roofs have been attempted—and in Italy!

Although there are absolutely no private buildings in Milan worthy of attention or of any architectural interest or value, there are several important rebuildings at present in progress, under the auspices of the "Ufficio Regionale" for the preservation of ancient monuments of the district, which are worthy of notice.

This Government Department or "Ufficio," now established in every provincial capital of Italy, which in its present form dates from about 1890, is an institution needing some explanation to English readers. Copied to some extent, presumably, from a similar Government Department in France, its scope embraces not only the necessary reparations and restorations of buildings actually in the service of Government officials, such as the clergy, schoolmasters, public offices, &c., but it also exercises a control and supervision over such private property as may be considered to possess artistic or historical associations. It is of course specially concerned with all work of an architectural character, comprising fresco paintings and sculptures, but in addition to what may be considered "fixtures," the department must also be consulted in any case of removal or translocation of mere furniture of an important description. The powers of the department in this latter direction appear to be exercised to a large extent, and up to the present without serious opposition. Such a Government institution would perhaps be hard to understand in England, where vested interests and personal rights in property, in such a sense, are more jealously regarded than in Italy. Our nearest approach to such an institution is perhaps the Society for the Protection of Ancient Buildings; which, however, has not of course the same official status.

As far as any one can at present judge, the influence of this department on the preservation of artistic and historical memorials in Italy is distinctly beneficial. The officials of the department seem animated with an intelligent desire to carry out the principles of modern conservatism and preservation, as opposed to the vulgar "restoration" of the past century. In the case of private property, the presumable "red tape" and officialism of a Government administration are probably the best means possible for delaying the ravages of the private "restorer." Public buildings rebuilt or restored by the department directly, run the danger of being overdone, as was the case with France in the days of Viollet-le-Duc; but in Italy the better taste of modern days, combined with greater economy of means at disposal, will prove a safeguard.

The rebuilding of the mediæval castle of Milan is the most imposing of the works at present being carried out by the "Ufficio" of Lombardy. A committee of the citizens is assisting the work with subscriptions, and when finished it will become the home of several learned, artistic, and educational societies, as well as of two or three museums. Although considered a "restoration," very little of the original fifteenth century building remained ten years ago to be "restored." Its walls, cut down to half their

original height, were encumbered with sheds and hovels both inside and out, and its appearance was entirely devoid of any character. Such architectural details as existed in the form of entrances into the enclosure used as a barrack were in the Napoleonic "Empire" style. The imposing towers and battlements which are now rising around the old courtyards are consequently due to the ingenious study of Signor Moretti, the architect in charge of the work. When finished, this "restored," or rather new, castle promises to be a very creditable and satisfactory effort. It represents a careful study of similar buildings in a style peculiar to the Lombard district, many examples of which, seen from the railways of North Italy, impress the traveller with their immense size and simple outlines. Unfortunately, the Castle of Milan, instead of being surrounded by open country, or even the usual concomitants of an old city in harmony with its character, is now constituted the centre of an enormous semi-circle of the most ordinary-looking modern houses, which, although individually very large, look singularly mean and small under the circumstances. Such a background for such a monument is singularly unfortunate; it is as if the central part of the Tower of London were set down in the middle of a Bayswater square.

By the courtesy of Signor Moretti, chief of the Lombard "Ufficio," we are enabled to give two of his photographs of the castle specially taken for the *Builder*, together with a view of the restored interior of the Archbishop's Palace—the "Arcivescovado"—which has just been completed under his supervision (see lithograph plate).

The Palace of the Archbishop of Milan has been so much rebuilt in successive ages, especially in the eighteenth century, that it is wonderful that so early and characteristic a Renaissance feature as this cortile should survive. The curious projecting balcony, carried on consoles over the columns, is a very unusual treatment. The building is of brick, with stone architectural details; the walls are covered with painted decorations.

The beautiful church of St. Maurizio, filled internally with the frescoes of Bernardino Luini, has recently been repaired in a truly conservative spirit; not a particle of stonework has been renewed, except where it was absolutely necessary for structural purposes, and no new carving or painting has been introduced anywhere.

Concerning the Cathedral of Milan, some years ago a Milanese gentleman died, leaving a considerable sum of money for the purpose of reconstructing the west front. An international competition, as our readers may remember, was held for the purpose, and a series of designs appeared, which were all about equal in merit, and neither better nor worse than the florid and rather weak Gothic exterior of the building they were intended to complete. The intention is now to carry out the design of the late architect Brentano, whose design received the first place in the competition; the "Ufficio Regionale" intervening in the interest of any archeological discovery which may be made during the progress of the work.

Another bequest for beautifying this cathedral was made a few years back, with the object of providing bronze doors for the future west front. For various reasons—the disinclination of the Milanese sculptors

to descend to mere decorative work, and some element of uncertainty about the scheme—the public competition was very poorly responded to, and the matter has for the present been shelved.

THE RUSKIN EXHIBITION.



THE exhibition of Ruskin's drawings at the Gallery of the Society of Water-colours is calculated to confirm the opinion we have

more than once expressed, that Ruskin would have been a greater man, and would have left a more incontestable reputation behind him, had he devoted his powers to producing art instead of writing so much about it. True, his genius as a master of literary expression is as undeniable as his mastery with pencil and brush, but he has expended this literary genius on a great deal of exceedingly questionable art-criticism, while of the results of his work as an artist, so far as it went, there can be no question whatever. The present exhibition is one of the most interesting and varied that has ever appeared in that gallery, although all the work of one man; and it ought to be specially interesting to architects, for it contains some of the most beautiful architectural drawing ever seen. In this class of subjects Ruskin's work is remarkable not only for its accuracy and clearness of line and perspective, but for the unerring manner in which he gives the true character of the subjects he handles. The most practised architectural sketcher, who has devoted himself entirely to this class of drawing, could hardly rival some of the work to be seen here. Notice especially for instance, in the "Fountain at Rome" (11), a pencil drawing on toned paper slightly tinted with the brush here and there, the beautiful clean drawing of the front of a classic building seen in sharp perspective on the left, and which, rather than the fountain, makes the real subject of the picture. Notice also, near this, the "Market-place at Abbeville—Study for Detail" (6), a view of an old city square in which every characteristic of the various buildings is faithfully followed out and drawn, down to the most insignificant detail. The wonderful water-colour study of a portion of St. Mark's (19) has been exhibited in this room before; a second examination can only confirm one's opinion of its surpassing truth and delicacy of handling; and an almost equally remarkable one is that of an angle of the Ducal Palace (29), with the row of shafts and capitals down the side of the building, in the sharpest perspective, all followed in their intricacies and conscientiously drawn. In the pencil sketches on toned paper, slightly shaded here and there with the brush, it is remarkable what amount of distance and aerial perspective he obtains, in a medium difficult to get such an effect with, by the judicious introduction of a bit of rather more strongly shaded masonry in the foreground, throwing all the rest into its place; perhaps the very best example of this is in the beautiful sketch on "The Avenine" (144); an ideal of what an architectural sketch should be. The more elaborate and finished drawing of Abbeville, again (234), in which more colour is used, is wonderful in its completeness of effect and the careful manner in which the more distant bits of the architectural scenery are worked out. In quite

another manner the sketch with a soft pencil of the "Chapel at Reu, near Abbeville" (175), labelled "six hours' work," is quite masterly in its rapid but complete indication of the architectural detail. Ruskin's determination to secure a study on a large scale, even when he had no large paper at hand, is amusingly illustrated in the at first puzzling water-colour drawings which seem to be divided up into parallelograms of slightly varying scale of colour, having been originally made, piece by piece, on the separate leaves of a small sketch-book, which were then pasted down in position on a larger sheet of paper or card, as in No. 191 and one or two others. Then there is an admirable colour study of the coloured marble front of San Miniato; a fine colour study of the pier in the porch of St. Martin's Lucca (38); details and colour of the apse in the Duomo at Verona, covered with written notes; the "Castelbaroc Tomb, Verona" (92), a coloured elevation admirable in its representation of the texture as well as the colour of the different materials; "Spandril—Pisa" (125), a small sketch in which again the texture of the marble is admirably conveyed. Among the pencil and tint sketches, besides those already mentioned, some especially good ones are "Castel Vecchio" (27); "Castel del Uovo, Naples" (155); "Street in Naples" (166); "Fountain at Verona" (176); "Naples" (251); "The Prentice's Pillar, Roslin" (266—pencil only); "Bologna" (270), showing strongly the influence of Prout; "The South Transept, Melrose" (276—pencil only); and "Porta Capuana, Naples" (290).

The landscape studies are not equal to the architectural ones, except in cases where buildings enter considerably into the scene. In purely landscape subjects, Ruskin, in accordance with his own principles expressed in one passage in "Modern Painters" (though he practically contradicted it on other pages), seems to have been aiming at recording accurately the geological or other facts of the scene rather than at giving its poetic impression, and the landscapes are accordingly more valuable as records than as impressions. Exceptions to this are "On the Lake of Geneva" (289), and "The Pass of Killiecrankie" (368), which are fine landscape studies of effect, the latter especially. There are many other various classes of drawings; colour-studies of birds; an admirable one of a crab, in which both the colour and texture of the carapace are remarkably given; bits of carved detail drawn with great delicacy, and an exquisite little study of a spray of leaves (12). But the highest value of the collection lies in the architectural studies, which form in themselves a practical evidence how genuine was Ruskin's love of architecture, whatever may be thought of some of his opinions about it. Hardly anything in the collection, it is true, is really finished; the drawings are all the work of one who drew solely for his own pleasure or practice, and left off when his own object was attained; and it may be argued (he would perhaps have argued himself) that this is an essentially amateur attitude in art, and that there is a great gulf between the best sketch or study and a finished picture. Yet this exhibition seems to give evidence enough that the author of these drawings could have gone further in practical artistic production

had he made up his mind to it. In architectural sketching, at all events, his works are a perfect model, and architectural students should not miss this opportunity of considering them carefully.

NOTES.

A COMMUNICATION appeared in the Press recently pointing out the advantages of the Post Office Express Delivery Services. Many people are unaware that they can telephone a message of thirty words to a post-office for delivery by a messenger at the ordinary express rate of 3d. per mile. These telephonic facilities were promised by the Post Office to the National Telephone Company when they took over the trunk lines of the latter. It is thus possible for many business firms in London to send a message of thirty words to clients residing within a mile of Metropolitan post-offices quicker and at half the price that twelve words would cost by telegraph. As the Post Office will soon be competing with the National Telephone Company, it is only right that the privileges of the latter company should be known. In the opinion of many it is time that the legal decision in the case of the Attorney-General v. The Edison Telephone Company, of London, should be revised. As Dr. Fleming says, the judgment virtually amounts to this, "that the Post Office possesses the sole right to transmit intelligence for profit," not only as the art was known in 1880, "but by any and every means which the wit of man might through endless ages devise." A fitting commentary on this is that the Post Office makes a loss on its own proper telegraph business, which it works itself, and takes over 100,000*l.* a year in royalties from the National Telephone Company, which it does not work. It is hardly fair to inventors that all methods of transmitting signals, sounds, or visual images, whether with or without wires, and all methods by which one human mind can affect another intelligently, must not be practised for profit in this country unless the Post Office obtains the lion's share of the profits and runs none of the risks. As the ether is supposed to fill infinite space, its monopoly by the British Post Office is rather ludicrous. If this monopoly were being administered in the best way no great harm would be done; but if it is used, as we are afraid that it sometimes has been used in the past, to drive electrical inventors out of the country, then it is time that the whole question should be reopened.

THE accidents that occurred in Liverpool on Monday night illustrate very forcibly the danger of having overhead trolley and telephone wires in the same streets. During a heavy fall of snow the telephone wires suddenly gave way and, making contact with the trolley wire, they became a source of the greatest danger to the people in the streets. Two men were killed outright, and many people were taken to the hospital suffering severely from electrical shock. There were many dreadful scenes of people in agony unable to free themselves from contact with the wires. Efforts were made to relieve them by cutting at the wires with a hatchet, and as promptly

as possible the current was cut off. As the accidents happened during the night in a blinding snowstorm they might easily have been much worse. Even a wireman with rubber shoes and gloves and insulated pliers would have taken some time to clear away the debris of some fifty telephone wires in the dark, and the operation would not have been free from danger. These accidents were very similar to one at Vienna, which we described two or three months ago, and the same conclusions are to be drawn. When an overhead trolley wire is used for electric traction, telephone, and telegraph wires should be placed underground. It has been proved over and over again that the so-called guard wires are very inefficient, and are in themselves a source of danger, as it is always possible that they might break. Accidents like this one at Liverpool will do harm to the cause of electric traction in this country, and those electricians who desire that the people should have the benefit of a cheap and rapid means of locomotion would do well to take precautions, so that similar accidents would be a physical impossibility.

THE Hampstead Heath Protection Society have issued their fourth annual report. The Committee have been in frequent communication with the London County Council in regard to various points which they consider require attention or alteration, but apparently not with very satisfactory results. Among other things they have called the Council's attention to the cast-iron drinking-fountains lately placed on the Heath, and have suggested that any fountains placed in future on the Heath should be of rough stone or some suitable material, and more in harmony with the character of the surroundings; a recommendation with which we entirely concur. They have also given attention to the question of the bare state of the banks of some of the ponds on the Heath, and have suggested to the London County Council, as a beginning, some practical steps which might be taken for restoring the natural aspect of the banks of the Leg-of-Mutton Pond; but what they mean by the "natural aspect" is not very clear. The Committee have also been in correspondence with the New River Company, who have acceded to their request that the banks of the newly enlarged reservoir on the summit of the Heath should be planted with suitable trees and shrubs. The Committee are watching with much anxiety the proceedings of the promoters of the proposed extension of the Charing Cross, Euston, and Hampstead Railway in the direction of Golder's Green and Hendon. They are in communication on this subject with the Commons Preservation Society, the Metropolitan Public Gardens Association, and the Hampstead Borough Council, with a view of co-operating in opposition to any features of the scheme which would be injurious to the Heath. They deprecate any tunnelling under the Heath, and the erection of any station which would in any way encroach or infringe upon it, and here also they are perfectly right. Unless a strong stand is taken the Heath might be practically ruined as far as its true beauty and its value to Londoners are concerned.

Post Office Monopolies.

Hampstead Heath Protection Society.

Trolley Wire Accidents.

The Rating of Montague House.

The difficulty of arriving at a satisfactory value, for rating purposes, of great mansions has been well exemplified by the appeal which came before the County of London Overseers in regard to the rating of the Duke of Buccleuch's well-known mansion, Montague House. The old rating was:—Gross value, 4,200*l.*; rateable value, 3,500*l.* These figures had now been raised to 5,500*l.* and 4,584*l.* respectively. Not only did the Duke say, on his appeal, that these figures were too high, he went so far as to ask that the figures of 1890 and 1895 should be lowered, on the ground that the residential value of property in Westminster had declined. The contention of the Local Authority was that the letting value of such a house was not the right criterion, and that the proper way to arrive at its true value was to take 4 per cent. interest on the actual cost of the structure and adding to that the ground-rent and land-tax. The court, judiciously, no doubt, gave no opinion on the basis to be adopted, but allowed the appeal by reducing the figures to 4,500*l.* and 3,750*l.* respectively. So far as we can judge, this means that the court did not accept the respondent's method of valuation, but, at the same time, believed that property in Westminster was more valuable than it was five years ago. As a matter of fact, such a building as Montague House could always have a high value for other purposes than those of a nobleman's residence. It is clear, however, that a rough-and-ready valuation, based to some extent on the rent obtainable and similar considerations, is not the only means of arriving at the rateable value of these great houses, for the county, aspect, locality, and many other circumstances would seem to have to be considered.

Sanitary State of Nuneaton.

DR. R. W. JOHNSTONE'S report to the Local Government Board upon the causes of epidemic enteric fever in Nuneaton and Chilvers Coton Urban District shows the old and oft-repeated story of contaminated soil coupled with water supply from shallow wells. It appears that house refuse and excrement are generally disposed of by means of midden privies, the receptacles of which are not always protected from the rain, and are often sunk several feet below the surrounding ground level. These middens, when full, are emptied by the Urban District Council, sometimes not more often than four times a year. Where they are not lined with impervious material, their contents soak into and pollute the surrounding soil. Water supply is largely from shallow wells, and old and leaky slop-water drains frequently pass close to the mouths of wells. Dr. Johnstone had a few wells opened, and a section was prepared by the surveyor showing their water levels as compared with the level of sewers in the infected area. As far as could be judged from the few wells represented in the section, it seemed that the water levels in the different wells of this area corresponded one with another, and hence it was not impossible that specific contamination of the ground water might influence the water of several wells. It only remains to add that all the wells examined were dry-streined with brick, and the tale seems complete.

SECOND ROYAL ACADEMY LECTURE ON ST. PETER'S.*

WE can hardly in thought put ourselves in the position of the men of the Renaissance, for to them it was a time of joy and ardent enthusiasm. This grand movement in the fine arts may be said to be of purely Italian origin; if not of Florentine, at least of the cities of the Val d'Arno. We know from Dante of the factions by which Florence and the neighbouring cities were torn and of the suffering of Milan at the hands of the Germans, but so great were the evils of the factions in Florence that Dante is always calling on the Emperor to come and rule this part of his empire. The Latin classics were much read in Dante's time by the advanced men, and shortly after his death Greek began to be closely and passionately studied. Boccaccio, from the advice of Petrarch, became one of the first notable Italian students of Greek. The Tuscans are supposed to have come from a Greek stock, and the air of Florence is both healthful and exhilarating, and the Tuscans were particularly keen witted and astute. Tuscany gave us Dante, Petrarch, Boccaccio, and Machiavelli. At the beginning of the thirteenth century Nicola Pisano had seen the superiority of Roman sculpture and copied and imitated it, and towards the end of the century Brunellesco and his friend Donatello, both sculptors, made their fatal journey to Rome and were both struck with the magnificence and elegance of the antique buildings and ruins there. Brunelleschi, who had sold a farm to go, and spent all the money he had started with, eked out a livelihood by his old trade of goldsmith and jeweller, which gave him the means of studying the Roman buildings and of investigating the Roman method of building domes, which after his return he put in practice in the doming of Santa Maria del Fiore (St. Mary of the Flowers).

Brunelleschi died in 1444 (the year that Bramante was born) after doing much work, doming the Cathedral, building the Pitti Palace, the church of St. Spirito at Florence, and much work elsewhere, as he thought in imitation of Roman work, but really infusing into his buildings the grace and simplicity of Classic work.

The novelty of the new architecture took the fancy of the Florentines and others, and the comparative simplicity, dignity, and elegance of Roman architecture not only satisfied the desires of the Italians, but by degrees took captive the whole of Christendom. Vasari, who was born in 1512 and died in 1574, and may well be taken as a judge of the opinions of his time, says of Brunellesco, "he was of so lofty an intellect that one may well say that he was sent by heaven to give a new form to architecture, already gone astray for hundreds of years, in which the men of those times had wrongly spent much treasure in making buildings without order, in an evil manner, of wretched design, with strange inventions, with ungraceful grace, and with worse ornament." Here you see the Renaissance opinion of Gothic.

Nothing can be said against the sculptor's and painter's taste; but a monument of architecture is not only a thing to look at—like a picture or piece of sculpture—for delight, but the architectural monument is intrinsically costly and for use as well as for delight; it is also a specimen of structural science which requires a profound knowledge of statics. This knowledge can only be acquired inexpensively by theory, or very expensively by practice; the medievals had to learn it by practice, and for nearly a century the elements were taught by the buildings put up falling down or going to ruin. But this is not all, for we may make trifling errors without failure, if we have ample means, by making those parts where the main strains occur twice, thrice, or four times as strong as is necessary. The medievals were so hampered from this, as those ages were very poor, so that unnecessary strength could not be afforded, and the medieval architects carried slightness to such a pitch that the loss of substance by weather-wear in a few hundred years has rendered many medieval buildings unsafe, and if the weakened parts had not been replaced with stronger parts in our own time the structure would have failed, if not have fallen down. This was primarily due to the weakening by weather-wear of the flying buttresses, so that

they could no longer resist the pressure of the vaults, while the fine open tracing of late Gothic has so perished that it looks like torn lace.

Skill in building is commonly reckoned by the ratio of the points of support to the whole area of the building, and Gwilt gives the proportion of the points of support to the whole area in the Pantheon at Rome as 0.232, which has stood since 13 A.D., or for 1,762 years.

The following is the ratio of points of support to total area in five other celebrated buildings—

St. Peter's at Rome	0.261
St. Sophia, Constantinople	0.217
The Cathedral at Florence	0.201
St. Paul's, London	0.170
St. Genevieve, Paris	0.154

I have only given the buildings with large domes, for in my opinion any other comparison is inapplicable, the small difference in the decimal does not strike one, but when you consider that the points of support in St. Peter's are 59,308 square feet, or nearly double the whole area of the Pantheon (which is 34,328 feet), you will judge how enormous it is, and you see by comparison that it is a larger proportion of the whole area than that of any other notable domed building. We suppose that Bramante had become an architect, and had at least some rough method of ascertaining whether his piers would sustain the weight of the dome, though we know that some of the piers showed signs of weakness before they were loaded. They were built up continuously day and night, probably without proper supervision. But Michelangelo never had the training of an architect, and all he could have learned about doming was from studying the cathedral at Florence. Ward says he was lucky in having Giacomo della Porta to do the doming and to put the requisite bands to restrain the thrusts in the dome and drum. As it is, the buttresses of the drum have cracked away from the other work and been cramped to it with iron ties.

The public should know that architecture is a structural science, and also that no important building should be undertaken without complete drawings and a model, while till Michelangelo had his model of the dome made, the whole design of St. Peter's was in a constant flux.

St. Peter's is said to have cost 46,800,000 scudi, nearly 10,000,000*l.* sterling, but looking at the purchasing power then, the 46,000,000 scudi may be looked on as pounds now.

It is to be regretted that Bramante did not have St. Peter's to build when he was in the fulness of his powers, instead of having only eight years at the end of his life; that he did not leave a complete set of drawings and a perfect model, for he was in my opinion the greatest architect of the Renaissance, and though he began as a painter, I think that we may believe that he made himself an architect there was a suave beauty about all his works that I know that is enchanting. Bramante's first scheme for St. Peter's seems to have been a square with sides 450 ft. long made on plan into a Greek cross by the crossing of the nave and transept* with the same length of arm, whose ends form square projections one in the middle of each side, roughly 130 ft. wide, and 43 ft. projection from each side of the square. The nave and transept are about 93 ft. across from wall to wall, ending in semicircular apses about 80 ft. diameter; the clear length of each internally is about 512 ft., there are two aisles to the nave and transept, the narrowest part of each of these aisles is about 40 ft. long and the aisles are about 370 ft. long and have semicircular apses at both ends about 30 ft. diameter, kept back about 30 ft. from the face of the building, making eight porticos. The four angles of the large square are sacristies about 60 ft. square internally, and were to be carried up as bell towers. In a later scheme of the same basis two columns are put between the narrow openings of the aisles which would have spoiled the vistas. These aisles and their chapels suggest top lighting. The blocking up of the vistas of the nave and transept aisle had been skillfully avoided by making the aisle clear of the piers of the dome. The dome seems to have been designed of the same diameter as the actual dome that was erected. There appears to be no elevation or section of Bramante's design that has come down to us beyond the one on the medal struck in commemoration of the first stone being laid in 1506 by Pope

* By Professor Aitchison, R.A.

* See plan in the last issue of the *Builder*, page 106.



Half Section of the Dome of St. Peter's (no scale).

ulus II., and what is shown in Serlio's book, so that we cannot know what lighting could be got from the clearstories. The view of Bramante's front of St. Peter's, taken from a medal 2 in. in diameter, does not strike one as being quite happy, but it was probably done in a hurry for the die-sinker; the bell-towers are ugly, but we may be quite sure that had the designs for their execution come from Bramante's hand, they would have had the grace and beauty that pervaded all his works. Of all the designs that Baron H. de Geymüller has given, the one from a drawing on which Antonio da Sangallo the younger has written on the back is, in my opinion, the most successful, only the bell-towers are rather too wide for the centre.

We must recollect that Bramante had such fertility of genius that he could sketch out at once his schemes, so we need not be surprised at the number of sketches that have come down to us; and as in the latter part of

Bramante's life he was afflicted with palsy, he was obliged to have some architect or draughtsman to put into form his descriptions and palsied scrawls, and this, in Baron de Geymüller's opinion, is why many of his designs have been attributed to B. Peruzzi.

One must not be surprised at the number of architects who submitted schemes or models, for in the conclave of cardinals there must have been many conflicting opinions and interests, and the very fact of Bramante's design being in plan a Greek cross must have had many opponents, and at last the plan was made into a Latin cross.

Before Bramante died Fra Giocondo and Giuliano da Sangallo were given him as aids during his illness. He died in March, 1514. Raphael and Giuliano da Sangallo replaced Bramante at St. Peter's, but on July 1, 1515, Giuliano da Sangallo retired and Fra Giocondo died the same day. What Raphael did besides making the plan for a new scheme

of basilica we know not, but he died in 1520, and a week before his death Antonio da Sangallo obtained the same remuneration that Raphael had, so we conclude he was made architect, for before he had only half the remuneration; and almost at the same date B. Peruzzi was made architect. I judge that the Italians always had two architects to their important buildings. In 1527 Rome was sacked by the followers of the Bourbon; after these had withdrawn Peruzzi returned to his office at St. Peter's in 1535, and remained in it till his death in 1536, and was buried in the Pantheon, and the place was then, I suppose, given to Antonio da Sangallo alone. According to Baron de Geymüller's plan, little else was done by Antonio than to strengthen the main piers under the dome, and a few other trifling additions and alterations, but beyond that he made several designs for a St. Peter's quite different from that of Bramante, and his wooden model is still in the model-room at St. Peter's.

Antonio da Sangallo was born in 1485 and died in 1546. On January 1, 1547, Paul III. conferred on Michelangelo the office of architect to St. Peter's for life, and Michelangelo then took in hand Bramante's modified design. Peruzzi before him had found Bramante's plan too expensive to be carried out and had suggested something smaller, but when Michelangelo became architect he always stated that any alteration from Bramante's plan would be a mistake; and we see from Baron Geymüller's plan that Michelangelo intended to leave the building as a square with a portico in front. Pirro Ligorio and Jacopo Barozzi da Vignola were made executors of Michelangelo's work, but P. Ligorio was dismissed for wanting to alter, and Vignola is said to have designed the small cupolas. Michelangelo died in 1564, having completed the drum of the dome, and Giacomo della Porta was appointed architect by Pope Sixtus V., with Domenico Fontana as his assistant about 1583; he is said to have finished the lantern in 1590. Fontana it was who raised the obelisk from the circus of Caligula and erected it in front of St. Peter's in 1586; and he died in 1607.

The finishing of St. Peter's, having been put up to a public architectural competition, was gained by Carlo Maderno, who was appointed architect November 5, 1607. The narthex was roofed in on December 12, 1614. By Maderno's converting of Bramante's design from a Greek into a Latin cross, the beauty of the dome is quite lost from a front view.

Giovanni Lorenzo Bernini, sculptor, painter, and architect, was born at the end of 1598, and at an early age showed remarkable talent for sculpture, so much so that Pope Paul V. is reported to have said to Cardinal Barberino, "Let us hope that this young fellow may become the Michelangelo of his age," and afterwards Anibal Caracci made a somewhat similar remark. When Cardinal Maffeo Barberino was made Pope Urban VIII., he had Bernini brought to him and said, "It is your good fortune, O Cavaliere, to see the Cardinal Maffeo Barberino Pope; but our fortune is much greater, that the Cavaliere Bernini should live in our pontificate." Shortly after his election he ordered Bernini to make the high altar and baldachino. A great deal of the bronze from which it was cast was from the bronze casing of the bressummers of the portico of the Pantheon. These bronze casings are shown in one of the sixteenth-century books, but which one I have forgotten. Bernini did some trifling work besides in St. Peter's, and, I think, put up the front bell-towers, now taken down, and built the celebrated staircase to the Vatican at the side of St. Peter's. I never saw any of Bernini's paintings, but his sculpture made quite an epoch in Europe. He executed one statue of Charles I. from the portraits by Vandyck which were sent out to him.

Most of the philosophers whose works I have read holdly take it for granted that mankind at all epochs have the same capacity, and it is difficult to prove that this is not the case, although we can be certain that in some cases the classes who once furnished the highest intelligences have deteriorated and can no longer furnish them, and there can be no doubt that the capacity shown in the Fine Arts is sometimes, or in some epochs, greatly superior to that of others. We know that the capacity of the Greeks just after their successful struggle against Persia was superior to that ever after evinced; and that in the Golden Epoch of the First Empire the Roman architectural monuments were superior to those of the Silver Age, if we except the Pantheon. At

the third great epoch, the Middle Ages, the Romanesque, though very impressive, was perhaps inferior in some respects to the finest specimens of Gothic when fully evolved; at any rate the Gothic was a complete system of a new art of vaulting and buttressing, and the piercing of all parts only wanted for stiffening; but it never attained the dignity and impressiveness of the Norman Romanesque; witness the nave and choir of Southwell.

At the Renaissance in Italy there was a delicacy and grace about its first development which gradually disappeared, and formalism prevailed and eventually gave place to conformation.

In 1414, thirty years before Brunelleschi died, the codex of Vitruvius was found at St. Gall by Poggio, and between 1480 and 1490 the "Editio Princeps" of Vitruvius was printed and published at Rome. The architects and artists, when they became conversant with Vitruvius, supposed that they had got a book which would enable them to rival the best works of the Romans, and a stricter adhesion to his rules was almost universally followed.

We know that Alfonso the Wise told Panormita (Beccadellii) that he would build the Castel Nuovo of Naples from Vitruvius alone, and that mighty genius Michelangelo seemed to favour the view that everything that Vitruvius said was perfect and applicable, and though Michelangelo's genius enabled him to produce sublime works, such as the tomb of the Medici, even this is full of glaring inconsistencies. But nothing that Michelangelo ever did had that grace and sweetness which so distinguished Bramante. As Michelangelo studied Bramante's designs he became more and more convinced that his scheme was the right one, and professed merely to carry out Bramante's design; but it was impossible for a man of his originality and power to carry out the work of another man of a genius entirely different, even if the size of it had not been too large for its cost to be defrayed when the resources of the Papacy were diminished after the Reformation. But the dome of St. Peter's, for which he left a model, is, I think, the most graceful dome I have seen. When I was in Rome as a student I frequently had to return on foot from San Lorenzo outside the walls. It was just as the sun was setting, and then before my eyes I had this graceful outline of the drum, dome, and lantern before me, fringed with the golden red of the setting sun; and whatever may be said about St. Peter's in regard to the indifferent taste displayed in details, the dome not only grows upon the visitor, but is looked upon by foreign artists who have lived for many years in Rome as one of the finest things in the world; and we must recollect that the size, the colossal proportions, and the solidity of the building must always impress mankind, even if it were a ruin. The ruins of the great baths at Rome, although stripped of their statues, precious marbles, columns, ornamental carving, and bronze, impress everybody that goes into them with a sense of their sublimity; and though we may wish that a purer and finer architectural sense might have been possessed by the architects and by the educated public when St. Peter's was completed, it is still one of the most impressive buildings of modern times.

A SENSATIONAL GAS SCHEME.

An attempt is to be made during the next session of Parliament to pass a Bill to sanction the formation of a company with power to supply gas to a number of Midland towns at a maximum charge of 4d. per 1,000 cubic feet, or in the case of a consumer using not less than 4,000,000 cubic feet per quarter, at a maximum price of 3d. per 1,000 cubic feet. This Bill is known as the Mond Gas Bill, and the gas which it is proposed to supply is Mond or similar low-grade gas, which may be sold for all purposes except for illumination. The district to be supplied is a large one, including Smethwick, Walsall, West Bromwich, Wolverhampton, and several other neighbouring towns, but the Company does not ask for a monopoly of the power to supply this area with fuel gas.

The apparently extraordinary propositions contained in this Bill have evoked some amusing comments in the popular Press, in which the proposed prices have been compared with the existing charges for illuminating gas, without regard to the fact that Mond gas is of only one-fourth the value of coal gas for heating or motive-power purposes, and

would require service pipes of four times the usual capacity if supplied at the same pressure.

Mond gas is a description of "producer-gas" produced with the aid of an unusually large quantity of steam, and a characteristic feature of the process is the manufacture of a large quantity of ammonium sulphate as a by-product, the sale of which is to cover the cost of the coal slack required for the production of the gas.

Roughly speaking, the illuminating gas supplied in London costs 1s. per 1,000 cubic ft. to manufacture, and another 1s. per 1,000 cubic ft. to distribute to the consumers. It is therefore difficult to conceive that fuel gas can be profitably distributed in comparatively small quantities at 4d. per 1,000 cubic ft. (The Company may refuse to supply any consumer requiring less than 1,000,000 cubic ft. per quarter.) The supply at 3d. per 1,000 cubic ft. to consumers taking not less than 16,000,000 cubic ft. per annum is perhaps more feasible, because the plant required for the production of the gas does not occupy a large area of ground, and it might be expedient to erect a special plant in close proximity to the premises undertaking to consume so large a volume of gas. Distribution charges might thus be reduced to a minimum. This, however, is not the method of distribution at present contemplated.

The distribution of cheap fuel gas has, we believe, been attempted in the United States, but has not proved a commercial success. The district which the present scheme proposes to supply undoubtedly comprises an excellent field for an enterprise of this description, but it is exceedingly doubtful whether a dividend could ever be earned with gas selling at the prices quoted; and the Bill will, of course, meet with great opposition from those who already supply these districts with illuminating gas, which is very largely used for fuel purposes. Difficulty would also probably be experienced in preventing consumers from using the gas for illuminating purposes. The attempt is, however, a step in the right direction, for gaseous fuel can be more economically consumed than solid hydrocarbon mixtures of varying composition, such as coal. Already fully half of the enormous output of illuminating gas from the London gasworks is used for purposes for which non-luminous gas of the same heating power would be equally serviceable; and as several processes are now known by which non-luminous water gas possessing half the heating value of 16-candle coal gas can be manufactured at considerably less than half the cost, the question is being asked in many directions as to whether the time has not arrived when the gas companies should be requested to supply a cheap non-luminous gas in the place of the expensive illuminating gas at present supplied.

In view of the extreme importance of the calorific power of the public gas supply to London consumers, who drive many thousands of engines with it and use it for cooking in most of the numerous restaurants and hotels, it is remarkable that the London County Council has not, so far as we are aware, given any attention to this matter. This is the more strange, since it is a matter of public knowledge that the composition of the gas supplied has, during the last five years, been undergoing a change owing to the ever-increasing proportion of carburetted water-gas added. Ceaseless watch, it is true, is maintained by the Council upon the illuminating power of the gas, but two gaseous mixtures of equal illuminating value may possess very different heating values. We do not know with what degree of success non-luminous producer gas can be used with the incandescent gaslight system or with the "albo-carbon" system, but any difficulties which may exist cannot be insuperable. High-grade water gas, such as that made by the Dellwik-Fleischer process, could, we believe, be used with either system as an illuminating agent.

It is unfortunate that any radical change in the character of the gas supplied necessitates a change in all the gas-burners employed. We have already drawn attention to the fact that the South Metropolitan Gas Company will reduce the quality of its gas from 16-candle power to 15-candle power after June 30 next, and subsequently to 14-candle power, and that one of the conditions upon which this reduction to 14-candles is to be permitted is that the company will exchange old burners for new burners better adapted to consume the poorer gas free of charge. Similarly, if non-luminous gas were substituted for illuminating gas, all

the present burners would have to be discarded; but if the change is to be made, it may be better to make it in one stage than in a number of gradations.

The great demand for gas for the generation of electricity, for driving engines employed for all kinds of industrial work, for cooking and heating, and for incandescent gas lighting, has to so large an extent changed the standard of quality from the consumer's point of view from one of illuminating power to one of heating power, that we anticipate a radical change during the next decade in the tend of gas legislation, accompanied by a remarkable increase in the volume of gas manufactured. An indication of the quantity of gas that will be required when gas becomes universally employed as a source of motive power is given in a paper recently communicated to the Institution of Mechanical Engineers by Mr. Humphrey.* He stated that at the works of Brunner, Mond, & Co., at Winnington, Cheshire, a million cubic feet of gas are consumed per hour. An arithmetician might find interesting employment in calculating from this figure the quantity of gas that would be required to drive all the dynamo and stationary engines in the country, and, adding to the sum thereby obtained, the volume of gas consumed by a few hundred thousand gas fires and cookers. The resulting figure would serve as a rough estimate of the volume of gas which would be required to meet the public demand if Mond gas could be supplied in all our large towns to all classes of consumers at a maximum charge of 4d. per thousand cubic feet. It has often been suggested that two qualities of gas should be supplied, one for lighting purposes and one for fuel; but in most towns this is impracticable, owing partly to lack of road space, and it is probable that the consumers would speedily find some way of utilising the fuel gas for illuminating purposes at a cheaper rate than they could use the illuminating gas, and the supply of the latter would become unprofitable.

The Mond scheme, if sanctioned by Parliament, might not, and probably would not, be a commercial success, for, among other incidents that would follow its adoption, there would probably occur a rapid rise in the price of slack and a fall in the value of sulphate of ammonia. But if it attracts renewed attention to the possibilities of obtaining motive power from a smokeless agent at a lower cost than it can be obtained from coal direct, the introduction of the Bill may prove of great benefit to the community in general.

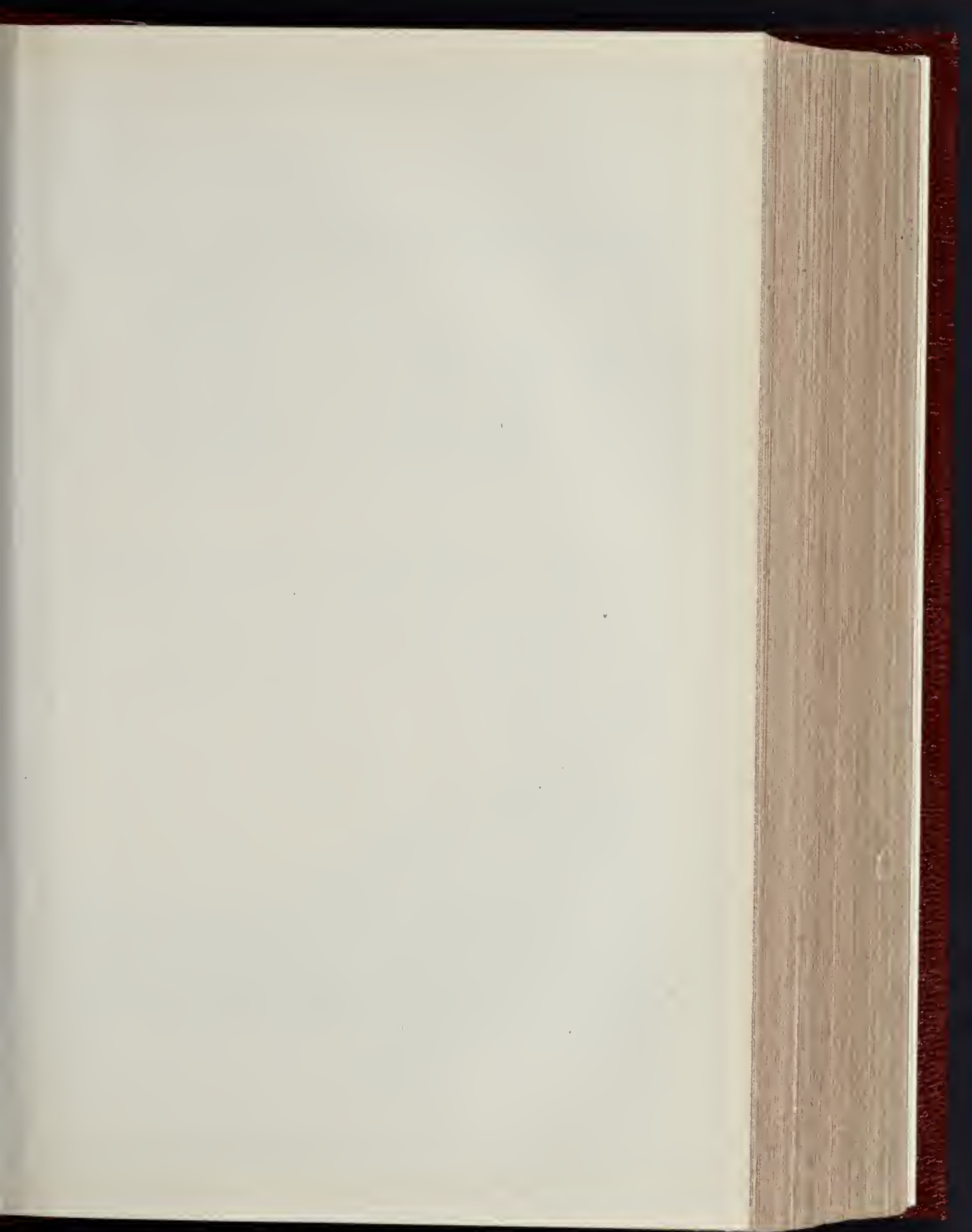
COMPETITIONS.

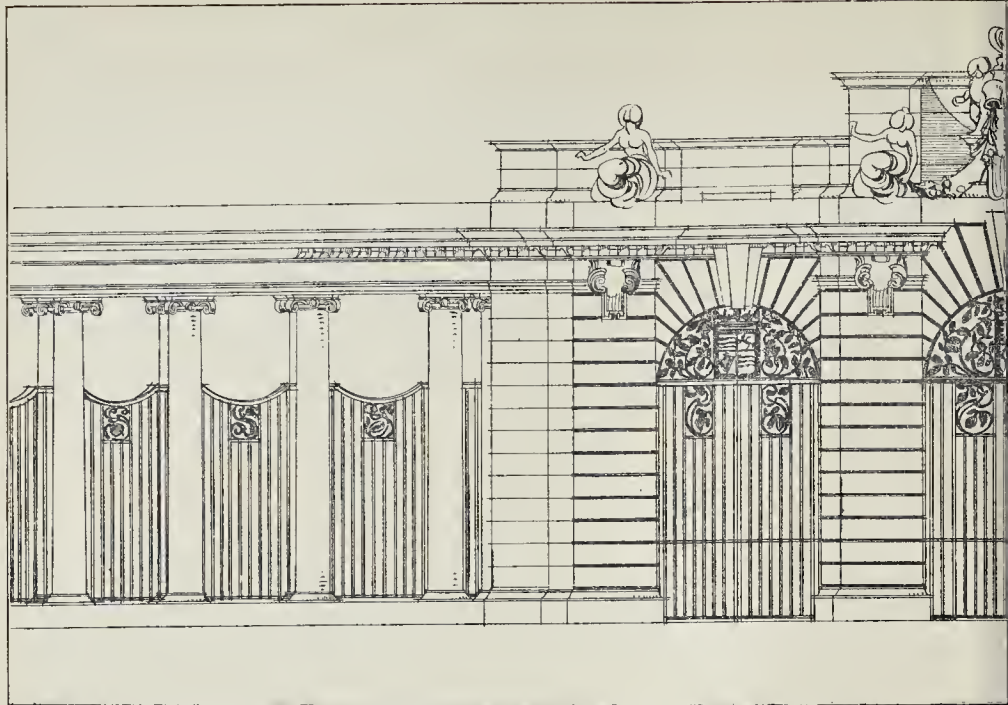
CARDIFF BOROUGH ASYLUM.—The Cardiff Asylum Committee, at a meeting recently arranged to meet Mr. E. G. Hine, the assessor in the competition among architects for designing the Cardiff Asylum to be built at Whit church. From a large number of competitive designs Mr. Hine selected five to send in complete drawings, and from these five he will make his award. The architects are Messrs. H. H. Wills and J. Anderson, Swansea; G. H. Catter and W. S. Skinner, Bristol; Hooley & Sander, Nottingham; Law & Allen, Arundel street, W.C.; and Greenaway & Newberry, Queen Anne's Gate, S.W.—*South Wales Daily News.*

WESLEYAN CHURCH, WESTERHOPE, NEWCASTLE-ON-TYNE.—The trustees of the proposed Wesleyan Church at Westerhope have selected the designs, submitted in a limited competition, by Messrs. Marshall and Tweedy architects, Newcastle. Their scheme is for a church to seat 500, with school hall, and a smaller hall to accommodate 100, vestries, an caretaker's house. The buildings are to be of stone.

ADDITIONS TO WESLEYAN SCHOOLS, PRESTON; LANCASHIRE.—Extensive additions and alterations have been made at St. Mary's-street Wesleyan Schools, Preston. Four classrooms have been added on the east side and four other classrooms have been extended. The increased accommodation is for 150 scholars. The new work is in stone, in conformity with the original building. The cost of the extensions has been about 2,700l. The work was designed by Councillor E. J. Andrew, and was executed by the following contractors:—Mr. Luca, Preston, the masonry and joinery; Mr. Woolton, the plumbing and painting; and Mr. Nixon, the flagging and slating.

* See the *Builder*, December 22, 1900.





R I B.A. Tite Prize, 1901:
Second Prize of Ten Guineas

DESIGN FOR AN ENTRANCE GATEWAY

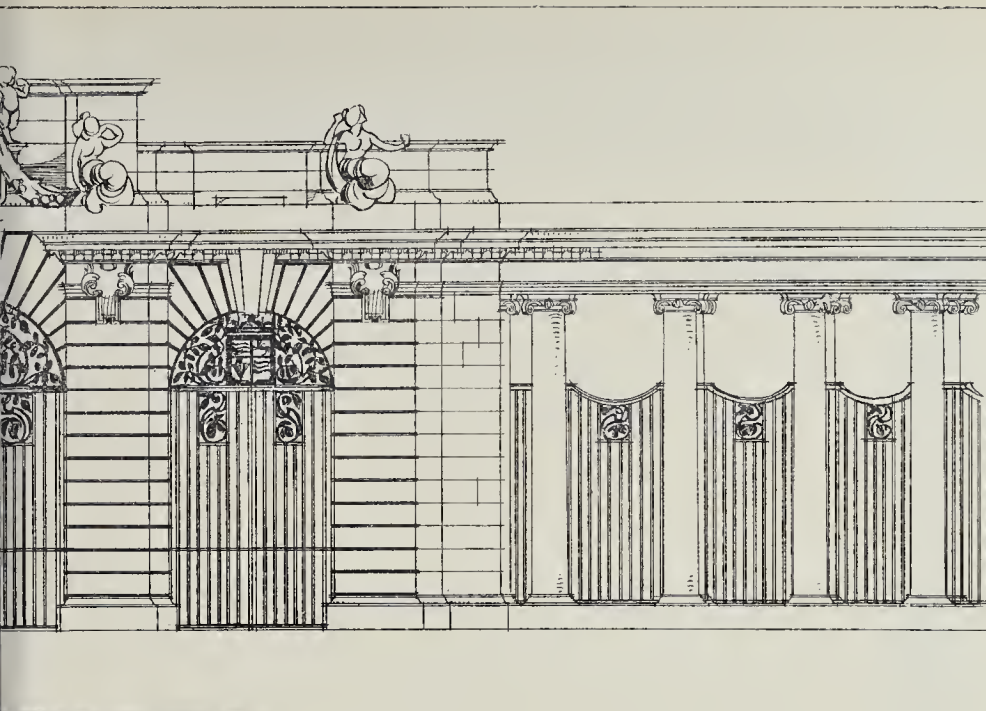
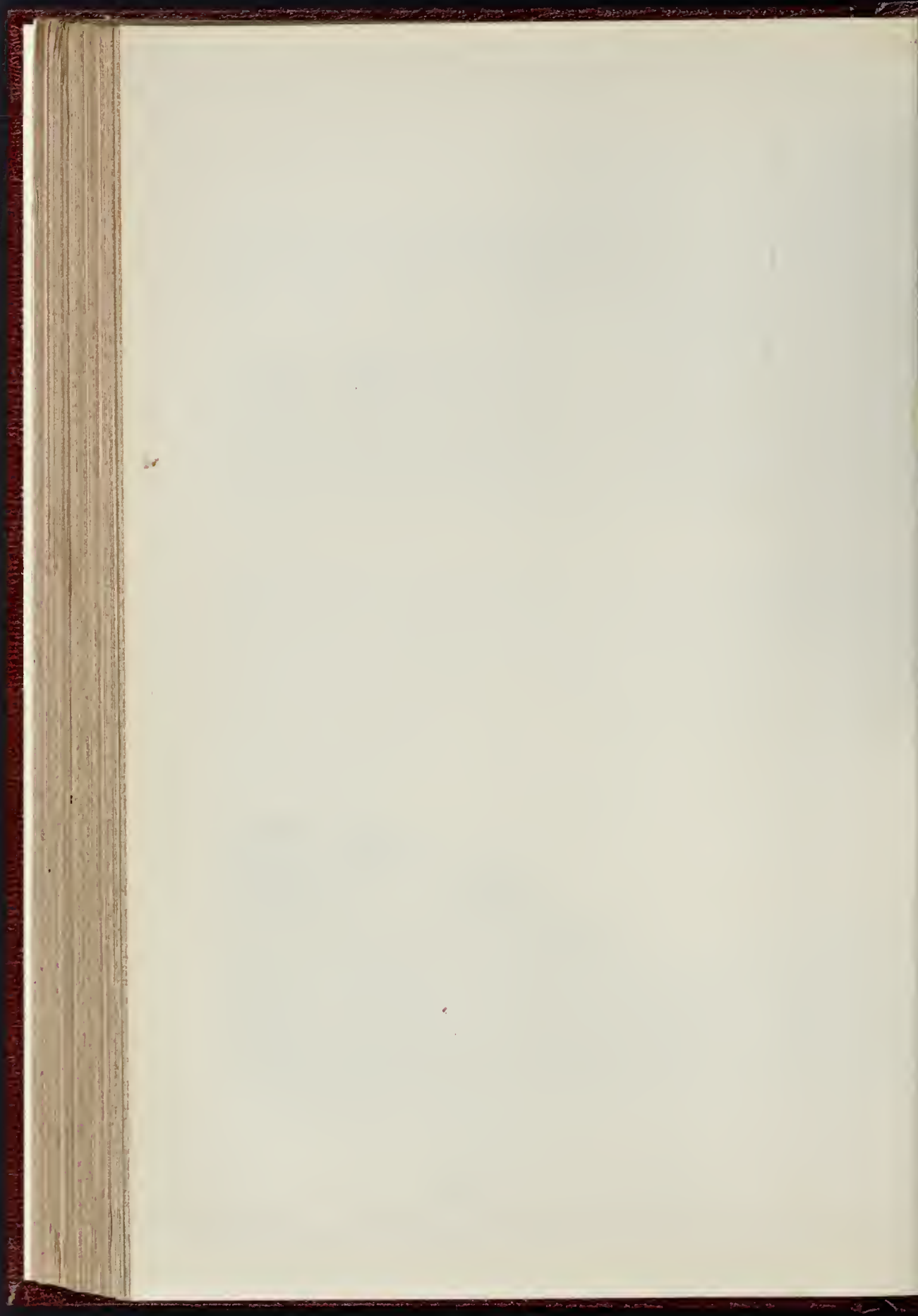


PHOTO-LITHO SPRAGUE & CO. L^{ts} 4 & 5 EAST HANING STREET, FETTER LANE E.C.

A PUBLIC PARK.—By Mr. RALPH KNOTT.





Bronze Memorial Tablet to be placed on the House, No. 27, Southampton-street, Strand, in which Garrick lived.

MEMORIAL TABLET TO DAVID GARRICK.

The bronze tablet of which we give an illustration is to be placed on the wall of the house, No. 27, Southampton-street, Strand, where Garrick lived for twenty-two years. The tablet is put up at the cost of the Duke of Bedford's estate. It is cast by Mr. Parlanti from a model prepared by Mr. H. C. Fehr, the sculptor, after a sketch by Mr. C. Fitzroy Doll, architect. The figures are supposed to be those of Melpomene and Thalia, the muses of Tragedy and Comedy. The portrait medallion was made after a study from an existing picture, and the dates on the tablet were obtained from the Parish Register of St. Paul's, Covent Garden. We may congratulate all concerned on having produced a memorial tablet of more artistic character and interest than most of those which have been affixed to historic houses in London.

ELECTRIC LIGHT, &C., HARROGATE.—Colonel A. G. Dumford, R.E., held an inquiry in the Council Chamber, Harrogate, on the 16th ult., respecting an application to borrow 10,000l. for electric light purposes and 1,000l. for sewerage purposes. As regards the electric light, the loan is required principally for generating plant. Mr. G. Wilkinson (Electrical Engineer) explained the scheme, and Mr. Bagshaw (Surveyor) the plans, &c. The loan of 10,000l. is to enable the Corporation to construct a sewer from the Grove Park Estate to take the sewage from that district to the sewage farm at Bilton.

WESLEYAN MISSION HALL, BILSTON, STAFFORDSHIRE.—A Wesleyan mission hall has been erected in Temple-street, Bilston, at a cost of 1,300l. Mr. H. Walker, of Wealdston, was the architect, and Messrs. Morrell Brothers, of Bilston, were the builders.

MAGAZINES AND REVIEWS.

THE *Art Journal* contains an article on "Decorative Flower Studies," with illustrations from drawings by Miss Foord, which we presume are intended not as decorative designs but as examples of the study of flower-forms with a view to their subsequent use in decoration. Drawings made with this object will probably be, and should be, different from those made with the view to a pictorial treatment of flowers. Miss Foord's studies are good examples of careful analysis of flower-forms with the pencil. Mr. Walter Armstrong contributes an article on "Early Italian Portraits," with illustrations from Ghirlandajo, Ambrogio de Predis, and Lorenzo di Credi. Mr. Maccoll contributes a short article to accompany an engraving of Rodin's "John the Baptist," which it is proposed to purchase by subscription for the nation. The article contains the extravagant praise of Rodin which is fashionable at present, but we do not see how a figure which is quite finished and has all its limbs complete can properly be accepted as a typical work of the Rodin of the present day. *Au reste*, it is a fine work, but we think a nude John the Baptist is a mistake; no one can ever think of John the Baptist without his "treatment of camel's hair." The frank nudity of the "Age d'Airain," Rodin's best work, was quite right; but a nude John the Baptist is out of keeping. Mr. Cosmo Monkhouse's article on the Charles I. statue at Charing Cross is really interesting, and among other things contains illustrations of two designs by Wren for the monument, which one may be thankful were not carried out.

The *Studio* (January 15) opens with an article on Manet, whose works appear much better

in black and white illustration than in their original often repellent, crude, and violent colour. The article is by M. Antonin Proust (translated we presume), and is marked by the usual indiscriminating adulation of Manet's friends and partisans; indeed, one may say there is hardly any such thing as "art-criticism" now, in the true sense of the word; what is so called consisting simply in picking out certain artists for worship, and praising indiscriminately all that they have done. M. Proust says that "it was reserved for Manet to revive the healthy national tradition—the love of the rare and unrecognised." That is precisely what we should call an unhealthy tradition. A remark of Manet's own at the close of his life is quoted—"you know, my work must be seen in its entirety. If I should vanish, I beg you not to let me go bit by bit into the public collections, for people would judge me ill." There is truth and perception in that. When Manet's works are seen collectively, one can at least see what he was aiming at. But he is an artist not at the centre of art. The number contains an attempt—hardly wise—to represent in chromolithograph Didier-Pouget's great picture "Gargillesse," at the last year's Salon; it would have been better to have given a reproduction in black and white, the attempt at an imitation in colour can never be successful except with a very conventional class of landscape-painting. The illustration (with some others) accompanies an article on Didier-Pouget's work, from which we are glad to learn that this fine landscape artist is still a comparatively young man. The number includes a short article by Mr. C. F. A. Voysey on "Domestic Entrance Halls," which, for houses of the better class, strike us as too domestic; it seems to be the new idea to make the interior of an ordinary-sized gentleman's

house as like a cottage as possible, a treatment at variance with the true fitness of things. Plans of two houses are given, but we observe that Mr. Voysey, like the architectural students at the Royal Academy, omits the compass point from his house plans.

The *Magazine of Art* contains an article on the work of Sir W. Richmond, and one by Mr. Spielmann on Louis Morin, who may be said to be a humorous artist dealing mainly with eighteenth-century subjects and figures. There is a rare talent in some of the designs illustrated.

The *Artist* has, under the title "A Minor Tuscan Town," an article on San Gimignano, with sketches of the celebrated towers, all that remain to us of the "flock of steeples" (in Browning's phrase) which used to be the characteristic of the Italian mediæval town.

The *Quarry* has a special article on "The Petrography of Building Stone," defining "petrography" as "the science which treats of the mineral composition and minute structure of rocks."

The *Gentleman's Magazine* is a good number, but none of the articles come within our province to notice.

The *Architectural Record* (New York) contains under the heading of "Leading French Architects" an article on the works of M. Bouvard, who was architect-in-chief for the 1900 Exhibition, and whose executed works give proof of a remarkable versatility, practical planning and temporary decorative art-palaces appearing to be equally within his grasp. Among the best of the permanent buildings illustrated is his façade for the building erected as the "Bourse de Travail," a scheme which, if we remember right, failed of its social and commercial objects. His central dome for the 1889 Exhibition is recalled by an illustration here, and is so harmonious in its general lines that one cannot but regret that it was not erected as a permanent building shorn of some of its gaudy accompaniments. The new capitol of St. Paul, Minnesota, is illustrated by a perspective from a drawing by the architect (Mr. Cass Gilbert); a rather weak building with a gracefully treated central dome. The plan is not given, but we have several of the sculptured figures (of Virtues, &c.), by Mr. Daniel C. French, which we must say remind us a good deal of Mr. Dodd's allegorical group, described in Stevenson's "The Wrecker," of which the Parisian sculptor under whom he had worked, being told it was for a kind of Prefecture, at first replied "Qu'est-ce que vous me chantez là?" but on learning it was for the States, added "Ah—en Amérique; ver' goot, ver' goot!" If the Americans have assimilated French architecture very successfully, they are certainly a long way as yet from French sculpture. Among the works of recent American architecture, illustrated from some photographs, is a stable in 78th Street, New York, which as an architectural treatment of that class of building is worth attention. An article on "American Artists and their Public," by Mr. Herbert Croley, is interesting as an appreciation of the position by an American, and the following passage is worth quoting:—

"While Americans are very much interested in works of art, they have little instinctive love either of the work or the art, and the writer—who, in this respect, and I hope in many others, is a good average American—can discern the plain and sufficient reason. What we want is art with associations and a background. The popularity of the recent decorations is not in the least a tribute to the intrinsic merit of the painting; it depends almost entirely on interesting accessories. The Congressional Library is thronged with visitors, because the place in which the decorations are situated impresses the patriotic imagination of the American people. They must be worth seeing, because they are in the Congressional Library; and everybody says they are worth seeing. Once the civic order has formally approved them, they have obtained an importance beyond the power of mere paint. So it is with the popular interest in art history. We make a great to-do about Phidias, Amiens, and Giotto. If we are a woman, we read essays on them to the members of our favourite club. We study them, we translate them into prose, we use them as educational influences, we find in them a source of spiritual illumination; but, I make bold to say, we very seldom genuinely enjoy them. We have not taken to them because of an actual and innocent love of beautiful things, but because the Garden of Art has been recommended to us as a serviceable training and tilting ground for our moral aspirations."

He adds, what we have no doubt is true, that the best American artists do not at all approve this attitude in regard to art, and find

in it one of their great stumbling-blocks both to progress and to appreciation.

The *Architectural Review* (Boston) gives among the illustrations to its latest issue a fine competition design for the new Union Club at New York, by Mr. Donn Barber; a design showing in its architectural treatment all the proper characteristics of club architecture. Mr. E. R. Smith's essay on architectural classics (books) is continued, and deals in this issue with French architectural writers, with a number of curious illustrations reduced from the pages of Du Cerceau, Le Pautre, and others.

The *Edinburgh Review* contains an article on "Landscape: Symbolic, Imaginative, and Actual," tracing the change from ideas of landscape with the ancients, with whom external nature was always the symbol of something in the mind or the destiny of man, to the modern view of landscape as a concrete fact or phenomenon. The article is concerned, naturally, with conceptions and descriptions of landscape in poetry as well as with its representation in art. The *Review* contains a well-written and judicious article on Velasquez—a review of several books of art history and art-criticism, pervaded, however, by some of that over-adulation of this great but seldom beautiful artist, which is the attitude of the modern art-critic.

The *Quarterly Review*, a very good number, contains, however, nothing that is within our province to comment on; one article is on the subject of "The Nicaraguan Canal," but it is purely political, and no question of engineering enters into it.

Scribner contains an interesting and picturesque article on "Carcassonne" and "Albi," with illustrations by the author, Mr. E. C. Peixotto. Under "The Field of Art" is an article by Mr. P. B. Wight on the question, which had been discussed at an architectural symposium at Chicago, "Can architecture again become a living art?" The direction suggested for the answer to the question may be best indicated by quoting the concluding paragraphs:—

"The modern independent designer spurns the thought of copying anything his neighbour has done, though he may be willing to use the same ancient model; and he indignantly protests if anything he does is copied. Evolution in architecture is impossible in such a case. It is only possible when every one copies the best work of his neighbour, and adds something to it of his own; and his neighbour thanks him for so doing, and goes and does likewise.

If we should take the models of Roman architecture for our starting-point, and recognise and structure that we now have, we would in time evolve a new architecture which would differ little from what we might get if we started with Byzantine or Gothic, provided all the architects adhered to the precept contained in the last sentence. So from whatever point of view we regard the question, "Can architecture again become a living art?" it will always be found that the first essential is that the architect shall stop his individuality. It is in this respect that the profession of the architect differs from that of the painter, the sculptor, or any other artist."

The conclusion is the same at which one or two able English architects have arrived; though others, again, are as strongly opposed to it. It seems to us that there is a great deal of truth in Mr. Wight's view.

The *Pall Mall Magazine* has secured a posthumous article by Charles Yriarte on "The Rise of the Romantic School in France," as represented by the works of such men as Gericault and Delacroix, followed by Diaz, Rousseau, Corot, Couture, Barye, &c., while Rude's fine relief on the Arc de l'Étoile is taken as representing the romantic movement in sculpture. The article, though short and concentrated, contains much interesting critical suggestion in regard to the period of French art treated of.

Harper contains a somewhat over-enthusiastic article by Mr. S. Whitman on the works of Franz von Lenbach, the German portrait-painter, with illustrations from his portraits of Bismarck, the present Pope, and Gladstone; all of them, we fully agree, highly characteristic portraits. Mr. Paul Meurice's article on "Victor Hugo as an Artist" is continued; but these semi-grotesque efforts of Hugo's are certainly not worth all the fuss here made about them.

The *Fortnightly Review* list of contents is headed by the rather surprising announcement of an article on "Railway Reform in Great Britain," by Mr. Rudyard Kipling. This however turns out not to be the usual style of

statistic article, but a most delightful and humorous treatment of the subject in a kind of Oriental parable, or parallel. Every one should read it, whether they care about railway reform or not. The general moral of it is that competition is the means to keep railways up to the mark, and that monopoly of a route or country tends to a sleepy and slack administration.

The *Berlin Architektur-Welt* gives an article with a number of illustrations on the competition designs for a new church at Zehlendorf, which illustrate both the wiry character of Gothic favoured in modern German church architecture, and the ingenuity and variety in planning which often accompanies it. The design by Herr Kieckhof, of Potsdam, for a brick church on a stone base, is the best and most interesting in architectural treatment. There are some interesting examples of modern villa residences by various architects.

The *Century* has a short article by Mr. R. H. Thurston, Director of Sibley College, Cornell, on "The Steel Industry of America." It is mainly statistical in regard to the present stage of this immense industry in America. Under "Open Letters" is an appreciation, or rather depreciation, of Landseer, which is rather too pessimistic, though it is quite true that Landseer's success was not a purely artistic one.

Knowledge has an interesting illustrated article on "Constellation Figures as Green-Coin Types."

The *Church Builder*, the quarterly record of the work of the Church Building Society, gives the statistics of work of the past quarter together with a historical sketch of the Rural Deanery of Woolwich, with sketches of the curious interior of Woolwich Parish Church, and of two of the new churches—St. Mark's, Plumstead, which we illustrated recently, and St. Paul's, Plumstead.

The editor of *Architectural Association Notes* has had the happy idea of asking all the former presidents who are living to write their New Century greetings to the Association; this has resulted in the collection of nineteen short letters expressing good wishes with suggestions for the best course for architecture at the present moment, which are of considerable interest.

WATER COMPANIES' REGULATIONS.

A CONFERENCE convened by the London County Council of the representatives of the City Corporation, the City of Westminster and the Councils of the Metropolitan Boroughs was held at the County Hall, Spring-gardens on Monday, to consider the proposed amended regulations of the Metropolitan Water Companies.

Alderman Dickinson, Chairman of the London County Council, presided, and in opening the proceedings said that the County Council would deal with the matter at their meeting the following day, and the following Monday the Local Government Board inquiry on the subject would be held. He welcomed the representatives, and he thought there could be no matter of more common concern to Londoners than the one they had before them that day. Even from the point of view of £ s. d. the proposed regulations, should they become law, would affect almost every household in London, and a great deal of expense would be forced upon inhabitants. The Council had tried to ascertain roughly what that expense would be. They had taken a house of the rateable value of 45*l.*, and it had been found that it would cost 53*l.* to the householder to carry out the regulations proposed. Another house of rateable value of 250*l.*, which was already provided with a cistern of the size and kind required, would require 85*l.* to be expended upon it, and, but for the cistern, 40*l.* more would be required. But perhaps the most striking instance of all related to a block of artisan dwellings now being erected. They had compared the cost of the water fittings of those dwellings under present regulations and under the proposed regulations, and they found that under the old regulations the cost of the fittings would be 60*l.*, while under the new regulations it would be 125*l.* If that sort of thing was to affect all the houses of London, as no doubt it would to a great extent, the situation was one of very great seriousness. There was no doubt that the proposed regulations had evoked the hostility of all the Borough Councils as well as the County Council. In 1872 an inquiry was held into

certain regulations of the companies in regard to fittings; that inquiry lasted a very considerable time, cost a large amount of public money, and was ultimately settled by a system of regulations under which the companies had carried on their business for the last thirty years. Those regulations had been to a very great extent perfectly satisfactory. The Royal Commission which sat last year pointed out that it had been stated to them that the system of examination of fittings of various houses was not satisfactory, and they had had brought to their notice the fact, which had been known for years, that there was an enormous amount of waste of water going on in London, though they did not sufficiently inquire into who was responsible for that waste. That waste did occur—that a large amount of water was unnecessarily used daily in London, was an undoubted fact, but whether it was the fault of the consumer or of the companies was a moot point, and for his part he thought, to a large extent, it rested with the companies, who had not properly carried out the powers they possessed. Taking the figures for last July he found that the Kent Company supplied at the rate of 36 gallons per head per day, whereas the Grand Junction Company could not do its business with less than 56 gallons per head per day; and between those extremes the other companies varied. But the conditions of London were not dissimilar, and if the Kent Company, and the New River Company, and the East London Company could give a satisfactory supply with about 36 gallons, it was evident that something must be wrong with the company which required 56 gallons per head per day. The amount of water which was lost by the differences between the companies was remarkable: the amount supplied last July was 247 million gallons daily, but if all the companies had carried out their undertakings as the Kent Company did, the amount would have been only 222 million gallons, or a saving of 25 million gallons per day. That was the question to which the water companies ought to apply themselves before they sought the extraordinary powers they were now asking for over the construction and management of the private houses of London. But even if a re-arrangement of the regulations of the companies was necessary, it was a grave question whether it was expedient at the present time, because the water question in London had assumed a very different complexion from that which it had in 1872. A Royal Commission had reported in favour of purchase by some public authority and there could be little doubt that the Government would take up the question of purchase before long. It was only under the heading in the report of the Royal Commission of what would be necessary if purchase did not take place that the proposals for increased and more efficient regulations came. There was no doubt that in a few years purchase would take place, and the only effect of proposed regulations would be to place the companies in a much better position before the arbitrator who would fix the price when the question of purchase arose. Some of the companies were very near the end of their resources, and if these regulations were agreed to their power would be extended and their position, from a financial point of view, greatly improved. But the position was serious. The companies had applied for those regulations to be made. He did not know that the Local Government Board had any power to refuse to consider the question. The matter would have to come up, and he could only rejoice at that day's demonstration, which showed that the representatives of Londoners, as a whole, would do their best to protect the interests of Londoners as a whole. The County Council would consider the matter the following day in the form of a joint report of the Water and Public Health Committees, and he would suggest that the conference should consider the recommendations of the joint committee on each of the proposed regulations of the companies. After some discussion as to procedure, the chairman's proposal was agreed to. Mr. T. McKinnon Wood, Chairman of the Water Committee of the Council, moved: That the Local Government Board be requested to adjourn the inquiry, seeing that the Government has intimated its intention of introducing a Bill in 1902 dealing with the water question. That, he thought, would strike at the root of the matter, besides leaving the Conference free to deal with the proposed regulations.

Mr. Shaw Lefevre seconded, remarking that it was monstrous that the regulations should be brought forward now, seeing that the Royal Commission had recommended purchase. An inquiry at the present time was a waste of public time and money. Mr. Morton said that in the City they had decided to go to the Local Government Board for permission to use automatic cisterns and three-gallon flush cisterns. The regulations, if agreed to would give the companies a great deal of power to interfere with property. Mr. Wood's motion was then agreed to. The first amended regulation proposed by the companies is as follows:—
1. *Place of communication-pipe*.—No "communication-pipe" for the conveyance of water from the waterworks of the company into any premises shall hereafter be laid [until after the point or place at which such "communication-pipe" is proposed to be] or brought into such premises [shall have had the approval of] *except at the place previously approved by the company.*
To this the Joint Committee of the Council recommended, and the Conference agreed, that Regulation No. 1 should be struck out, and the old regulation substituted. It was also agreed to add the following suggestion of a conference of Borough Councils south of the Thames and the Wandsworth Borough Council:—
Add "and in the event of the company not consenting to the position of a 'communication-pipe' as suggested by an applicant, there shall be an appeal to the Borough Council, whose decision shall be final."
The second of the proposed regulations of the companies is as follows:—
2. *Definition of "communication pipe"*.—In these regulations the term "communication pipe" shall mean the pipe which extends from the district pipe, or other supply pipe of the company, up to the "stop" ball valve, prescribed in the Regulation No. 24, and any pipe of the consumer subject to pressure from the company's main.
On this the Joint Committee recommended, and the Conference agreed, to oppose the proposed extension of the definition of "communication pipe."
The third proposal of the companies is as follows:—
3. *Not more than one communication pipe to each house*.—No house shall, unless with the permission of the company given in writing, under the hand of their secretary, be hereafter fitted with more than one "communication pipe."
The Joint Committee of the Council proposed "That a proviso should be added to Regulation 3 to the effect that branches from a communication pipe shall not be deemed to be separate communication pipes."
This gave rise to some discussion. It was agreed to strike out the words "under the hand of their secretary"; and it was also agreed to add to the recommendation of the Joint Committee of the Council words to the effect that there should be an appeal to the local sanitary authority in the event of the refusal of the water companies.
The following proposals, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14 of the water companies, and the recommendations of the Joint Committee of the Council at the end of each, were then considered. The recommendations were agreed to by the Conference:—
4. *Every house, with certain exceptions, to have its own communication pipe*.—Every house supplied with water by the company (except in cases of stand pipes) shall have its own separate "communication pipe." Provided that, as far as is consistent with the special Acts of the company, in the case of a group or block of houses, the water rates of which are paid by one owner, the said owner may [at his option] with the consent of the company in writing under the hand of their secretary, have one sufficient "communication pipe" for such group or block of houses, but each house so supplied shall be communicated, independently of any other house, by a stop valve, placed in a readily accessible position.
[L.C.C. Committee and Conference:—] That regulation No. 4 should be struck out and the old regulation substituted.
5. *Defective communication pipe*.—Any existing "communication-pipe" which is not as prescribed by these Regulations shall, when it becomes defective, or requires repair, be replaced by a lead-pipe of the prescribed weight.
[L.C.C. Committee and Conference:—] That Regulation No. 5 should be amended so as to provide that any existing communication pipe which is not as prescribed by the regulations shall when it becomes so defective as not to be watertight, be repaired or replaced by a pipe of similar material to the exist-

ing pipe, but of the prescribed weight for a new communication pipe; provided that the regulation shall not require the whole of the existing communication pipe to be replaced but only so much of the pipe as is not watertight and cannot be made so.]*
6. *No house to have connexion with fittings of adjoining house*.—No house supplied with water by the company shall have any connexion with the pipes, cisterns, or other fittings of any other premises, except in the case of groups, or blocks of houses, referred to in the [preceding] Regulation No. 4.*
[The L.C.C. Committee and the Conference had no observations to make on this regulation.]
7. *Connexion to be by ferrule*.—The connexion of every "communication pipe" with any pipe of the company shall hereafter be made by means of a sound and suitable brass screwed ferrule or stop-cock with union, and such ferrule or stop-cock shall be of a pattern approved by the company and shall be so made as to have a clear area of water-way equal to that of a half-inch pipe. The connexion of every "communication pipe" with the pipes of the company shall be made by the company's workmen, and the company shall be paid in advance the reasonable costs and charges of, and incident to, the making of such connexion.*
[Joint Committee and Conference:—] (a) That the words in italics should be omitted.
(b) That regulation No. 7 should be amended so as to provide that the company shall provide, fix, and maintain at their own expense the fittings and piping necessary to supply the water up to the premises, including the stop-cock.†
8. *Weights and dimensions of ferrules*.—Every ferrule shall be of not less than the following dimensions:—[Here follows an elaborate table which we have not space to print.—Ed.]*
[The Committee and Conference had no recommendations to make.]
9. *Materials and joints of external pipes*.—Every "communication pipe" and every pipe external to the house and through the external walls thereof [hereafter] respectively laid or fixed, in connexion with the water of the company, shall be of lead; all such pipes shall be properly protected to the satisfaction of the company against frost, theft, or mischief, and every joint thereof shall be of the kind called a "plumbing" or "wiped" joint.*
[Joint Committee and Conference:—] (a) That the word "hereafter" should be retained in line 2 of regulation No. 9.
(b) That the words "external to the house" should be inserted after the word "pipes" in line 3 of regulation No. 9.
(c) That the words "to the satisfaction of the company" should be omitted, and that words should be added to regulation No. 9 to the effect that in case of dispute between the company and the owner or occupier as to whether the pipes are properly protected against frost, theft, or mischief, the matter shall be decided by the Borough Council.†
10. *Material, joints, and position of internal pipes*.—Every pipe hereafter laid or fixed [in the interior of any dwelling-house] for the conveyance of, or in connexion with, the water of the company [must, unless with the consent of the company] shall, if in contact with the ground, or under the flooring or not visible, be of lead, but may otherwise be of lead, copper, or wrought iron lap welded steam tube at the option of the consumer; and every joint on lead pipe shall be of the kind called a "plumbing" or "wiped" joint. All pipes inside any building shall be accessible, and not be embedded in the plaster, stone, or brickwork of any wall, or placed behind match lining.*
[Joint Committee and Conference:—] (a) That the words "or under the flooring, or not visible," should be omitted.
(b) That the words "to be hereafter erected" should be inserted after "all pipes inside any building."
(c) That the words "or placed behind match lining" should be omitted, and that a proviso should be added to the regulation to the effect that it shall not be deemed to prevent pipes from being placed in properly formed chases, or behind movable casings.†
11. *Weight of lead pipes*.—No lead pipe shall hereafter be laid or fixed in or about any premises for the conveyance of, or in connexion with, the water supplied by the company (except when, and as otherwise authorised by these regulations, or by the company), unless the same shall be sound of good metal, and of equal thickness throughout, and of at least the weight following, that is to say:—

Internal diameter of pipe in inches.	Weight of pipe in lbs. per lineal yard.
3/4-inch diameter.	5 lbs. per lineal yard
1 " "	6 " "
1 1/4 " "	7 1/2 " "
1 1/2 " "	9 " "
1 3/4 " "	12 1/2 lbs. "
2 " "	16 " "
2 1/4 " "	22 1/2 " "
(New) 2 1/2 " "	30 lbs. " "

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

[Joint Committee and Conference:—] That the increase in the weight of lead pipes proposed in Regulation No. 11 be opposed.*

12. *Depth of Pipes Underground.*—Every pipe hereafter laid for the conveyance of, or in connexion with, water supplied by the company, shall, when laid in open ground outside any building and underground, be laid at least 2 ft. 6 in. below the surface and shall in every exposed situation be properly protected to the satisfaction of the company against the effects of frost.*

[Joint Committee and Conference:—] (a) That the words "where the pipes of the company are of the same or greater depth" should be added after "surface."

(b) That the words "to the satisfaction of the company" should be omitted, and that words should be added to the regulation to the effect that, in case of dispute between the company and the owner or occupier as to whether the pipes are properly protected against the effects of frost, the matter shall be decided by the Borough Council.

13. *No Pipe to be Laid through Drains, &c.*—No pipe shall be used for the conveyance of, or in connexion with, water supplied by the company, which is laid or fixed through, in, or into any drain, asphalt, sink, or manure hole, or through, in, or into any place where the water conveyed through such pipe may be liable to become fouled, except where such drain, asphalt, sink, or manure hole, or other such place shall be in the unavoidable course of such pipe, and then in every such case such pipe shall be passed through an exterior water-tight cast-iron pipe or jacket of sufficient length and strength, and of such construction as to afford due protection to the water-pipe.*

[Joint Committee and Conference:—] That Regulation No. 13 should be so amended as to prohibit persons from laying water pipes through drains, asphalts, sinks, or manure holes.*

14. *No Connection with Rain-Water Receptacle.*—No pipe for the conveyance of, or in connexion with, water supplied by the company, shall communicate with any cistern, butt, or other receptacle used or intended to be used, for rain-water, or for any water not supplied by the company.*

[The Joint Committee and Conference had no recommendation to make.]

No. 15 of the companies proposed regulations is as follows:—

15. *Fittings to be Tested and Stamped.*—All water-fittings shall hereafter be made in accordance with the particulars, weights, and dimensions prescribed by these regulations, and, previously to being fitted or fixed upon any premises supplied with water by the company, shall be tested and bear the company's stamp of approval. All fittings which when in use will be subject to pressure shall be capable of resisting a force of 300 lbs. per square inch. Fittings submitted for the purpose of being tested and stamped shall in all cases be of a quality at least equal to samples approved by the company. The company may make a reasonable charge for testing any water-fittings submitted to them for such purpose.

[The Joint Committee of the Council recommended that the regulation be opposed with a view to its being struck out of the regulations.]

The Conference agreed to this recommendation, with the addition of the following words as alternatives:—

"But, in the event of the opposition not being successful, that the regulations defining the weight and patterns of fittings be placed in the hands of a public authority, such as the London County Council, and that any fitting or appliance stamped by such authority may be used in any premises supplied with water by the metropolitan water companies.

Further that, if the water companies are to have the power to stamp fittings, they should do so without charge, and that the stamping should be a guarantee that the fitting is as described."

The following is Regulation 16 as proposed by the companies:—

16. *Waterway of Fittings.*—Except with the written consent of the consumer, no cock, ferrule, joint, union, valve, or other fitting, in the course of any "communication pipe," shall have a waterway of less area than that of the "communication pipe," so that the waterway from the water in the district pipe or other supply pipe of the company up to and through the stop-valve prescribed by Regulation No. 17 shall not in any part be of less area than that of the "communication pipe" itself, which pipe shall not be of less than $\frac{1}{2}$ -in. bore in all its course.*

The Joint Committee proposed, and the Conference agreed,—

"That the words 'hereafter provided' should be inserted after 'fitting' in line 3 of Regulation No. 16, and that the words 'Except with the written consent of the consumer' should be omitted."

The companies' next proposal is as follows:—

17. *Stop Valves.*—Every "communication pipe" for the conveyance of water to be supplied by the

company into any premises shall have outside such premises at or near its point of entrance [into such premises, and if desired by the consumer within such premises] a sound and suitable stop-valve of the screw-down kind, with an area of waterway not less than that of $\frac{1}{2}$ -in. pipe, and not greater than that of the "communication pipe," the size of the valve within these limits being at the option of the consumer, who shall also fix a second stop-valve inside the house or building.

[Such] Every stop-valve [if] placed in the ground shall be protected by a proper cover and "guard box" approved by the company, secured upon brickwork or other suitable setting.*

The Joint Committee recommended as follows:—

(a) "That regulation No. 17 should be amended by the insertion, after the word 'kind' in line 7, of the words 'such stop valve to be provided and maintained by the company at their own expense'."

(b) That all the words after "communication pipe" in line 9 of regulation 17 should be omitted, and the following words substituted, "The owner may at his option provide and fix a second stop-valve inside the house or building."

(c) That the second paragraph of regulation No. 17 should be omitted as a consequence of the foregoing amendments.

The recommendations were agreed to by the Conference with the following addition:—

(d) "That the outside stop-valve should be as near as practicable abutting on the frontage of the premises, but where there is a forecourt it should in all cases be placed in such forecourt, and that in all cases of dispute as to its position, there shall be an appeal to the local sanitary authority, whose decision shall be final."

The following regulation as proposed by the companies is entirely new:—

18. *Weights and Dimensions of Stop-valves, Draw-taps and Bath Apparatus.*—Every screw-down stop-valve, draw-tap, and bath apparatus shall be fitted with loose valves (such valves shall be lifted by the spindle and shall not be dependent upon the pressure of the water for opening), and shall be fitted for cold water with washers of oil-dressed leather, and for hot water with washers of vegetable fibre of the best quality, or other material approved by the company. The word "inlet" shall be distinctly marked on the inlet side of the stop-valve, and such stop-valves for attachment to lead pipe shall be made with screwed ends and unions. The spindles shall in all cases be of gun metal, but all other parts may be of brass of good suitable quality. Every stop-valve, draw-tap, and bath apparatus shall be of not less than the following weights and dimensions:— [Here follows an elaborate table which we have no space to print.—Ed.]

The Joint Committee recommended:

(a) "That the words 'which may hereafter be provided' should be inserted after the words 'apparatus' (line 3), 'valve' (line 11), and 'apparatus' (line 16), and that the words 'equally suitable material' should be substituted for 'material approved by the company' in line 9 of regulation No. 18.

(b) That the words '(such valves shall be lifted by the spindle, and shall not be dependent upon the pressure of the water for opening)' should be omitted.

These recommendations were agreed to, with the following addition:—

(c) "That the words 'waste arrangements of bath pans shall always be submitted for approval,' should be omitted from the table of weights and dimensions.

A long discussion took place on the following proposal:—

19. *Cold Water Storage Cisterns.*—Every house (or in case of flats each suite of rooms) supplied by the company shall, except with the consent of the company in writing, under the hand of their secretary, be provided with a cold water storage cistern or cisterns of sufficient capacity to contain in the aggregate at least 25 gallons of water for each room. Each outlet pipe from such cistern or cisterns shall be carried up inside 1 in. above the bottom of the cistern, and such outlet-pipe shall be commanded by an efficient screw-down stop-valve, placed in a readily accessible position, within 1 ft. of such cistern, and a draw-off tap from same shall be provided. In no case may there be any connexion between the draw-off pipe from the cistern and the supply or communication pipe.

The Joint Committee recommended that the regulation be opposed, with a view to its being struck out of the regulations, but one or two of the representatives expressed the belief that the Committee is in error in objecting to the use of cisterns. The following recommendation was moved by Mr. Councillor J. T. Clark and seconded by Mr. Councillor E. Gates:—

(a) "That this Conference, while agreeing that

storage cisterns are necessary to ensure consumer against temporary stoppage of supply, and that such cisterns should be properly designed for storage of water, is of opinion that the character of such cisterns is a vital public health question upon which public opinion stands in much need of guidance, and suggests that the London County Council shall take such steps as it may deem expedient for holding a public competition of the improved cisterns now in the market, and to make suitable awards of merit thereon.

The motion was defeated, and the recommendation of the Committee was agreed to by a large majority.

On the following proposals of the companies no recommendations were made by Committee or Conference:—

20. *Buried cisterns prohibited.*—No cistern buried or excavated in the ground shall be used for the storage or reception of water supplied by the company, unless the use of such cistern shall be allowed in writing by the company under the hand of the secretary.

21. *Wooden receptacles prohibited.*—No wooden receptacle without a proper metallic lining shall [hereafter brought into use] used for the storage of any water supplied by the company.*

The following are the amended regulations proposed by the companies from 22 to 30 inclusive, with the recommendations of the Committee in brackets, which recommendations were agreed to by the Conference:—

22. *Character of Cisterns.*—Every cistern used in connexion with the water supplied by the company shall be made, and at all times maintained, water-tight, and be properly covered with a close-fitting lid, and placed in such a position that it may be readily inspected and cleaned.

[That the words in italics be omitted.]

23. *Protection of Cisterns.*—Every cistern hereafter fixed in connexion with water supplied by the company shall, except with the consent of the company, be placed within the house or building, and shall have a clear space of not less than two feet between its top, measured from the centre, and the ceiling, rafter, or roof, and any cistern hereafter fixed in an exposed position shall be bricked around or otherwise properly protected, to the satisfaction of the company, against frost, theft, or mischief.

[That the regulation be opposed, with a view to its being struck out of the regulations.]

24. *Ball Valves.*—Every [such existing] cistern shall be [if not already] provided, and kept provided with [an efficient "ball-tap," and every such future] cistern shall be provided with a sound and suitable "ball-tap" of the valve kind for the inlet of water, and suitable "ball-cocks" securely braced into the inlet pipe (which must be firmly fixed, and so that the ball will not become submerged or allowed to arise within two inches of the lower side of the warning pipe.*

[That the words "connected to" should be substituted for "branched into" in line 6 of regulation No. 24, and that all the words after "water" in line 9 should be omitted, and the following words added, viz., "to overflow by the warning pipe, provided that this regulation shall not require any such ball-tap to be altered or replaced, or replaced in cases where the ball-valve is or can be made to be in such working order as to prevent overflow of water as aforesaid."]

25. *Weight and dimensions of ball-valves.*—Every ball-valve shall be so constructed and fixed as to shut off when under a pressure of 100 lbs. per square inch, and shall be provided with a copper ball, with a brass stud to screw on to the lever, and a piston of the valve which comes in contact with seating shall be screwed, and fitted with a cap containing the rubber washer, which shall be made of 3-ply rubber of the best quality. The ball-valve and various parts shall be of not less than the following weights and dimensions. [Then follows a table which we have no space to print.—Ed.]

[That the words "which may hereafter be provided" should be inserted after "ball-valve" in line 6 of the regulation.]

26. *Waste pipes to be removed or converted into warning pipes.*—No overflow or waste pipe other than "warning pipe" shall be attached to any cistern supplied with water by the company, and every overflow or waste pipe existing at the time of these regulations come into operation shall be removed, or [at the option of the consumer shall be converted into an efficient "warning pipe," within two calendar months next after the company shall have given to the occupier of, or left at, the premises in which such cistern is situated, a notice in writing requiring such alteration to be made.]

[That the regulation be struck out and the regulation substituted.]

27. *Arrangement of Warning Pipes.*—The outlet of every "warning pipe" shall be placed in such a situation outside the house as will admit of the charge of the water [iron] for such "warning pipe" being readily [ascertained] seen by the officer of the company entering the house. And the pos-

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

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of such "warning pipe" shall not be changed without the previous notice to and approval by the consent of the company. Every "warning pipe" shall be made to discharge not less than 2 ft. above any drain, sink, or gully, over which the same may be fixed.*

[That regulation No. 27 should be struck out, and the old regulation substituted.]

† 28. Weight of Lead Pipes having Open Ends.—Every lead "warning-pipe" and other lead pipes of which the end is open, so that such pipe cannot remain charged with water, may be of the following minimum weight, that is to say—

1/2 in. (internal diameter)	3 lbs. per yard.
3/4 "	5 "
1 "	7 "
1 1/4 "	9 "
1 1/2 "	12 "
1 3/4 "	16 "
2 "	18 "

} New*

[No recommendations were made by the Committee or Conference to this and the next proposal.]

† 29. Ordinary Draw-taps.—No draw-tap shall in future be fixed unless the same shall be sound and suitable, and of the "screw-down" kind.

[Regulations 30, 31, 32, and 33, as proposed by the companies, are as follows, the recommendations of the Committee, in brackets, being agreed to by the Conference.]

† 30. Direct Draw-taps.—A draw-tap of a proper screw-down pattern may be placed in connexion with the "communication pipe" in a suitable position in any house or building.

[That regulation No. 30 should be amended so as to read as follows:—"Draw-taps of proper screw-down patterns may be placed in connexion with the rising main, or branches from the rising main, in suitable positions in any house or building."]

† 31. Draw-taps in connexion with stand-pipes.—Every draw-tap in connexion with any "stand pipe" or other apparatus outside any dwelling house, in a court or other public place, to supply any group or number of such dwelling houses, shall be sound and suitable and of the "waste-preventer" kind, and be properly protected [as far as possible from injury by], to the satisfaction of the company, against frost, theft, or mischief.*

[That the words "to the satisfaction of the company" be omitted from the regulation.]

† 32. Boilers, Water-closets, and Urinals to have Separate Feed Cisterns.—There shall be no direct communication [from] between the pipes of the company [to] and any boiler [urinal or water-closet], water-closet, urinal, drain, trap, gully, flushing cistern, or service box. Every boiler [urinal and water-closet in which water supplied by the company is used (other than water-closets in which hand flushing is employed) shall, within three months after these regulations come into operation, be served only through a cistern or service box and without a stop-cock] shall be supplied through a separate covered feed cistern, and every water-closet and urinal through a covered flushing-cistern or covered service box, all such supplies being taken from a storage cistern. Stool cocks, or other apparatus by which water may be allowed to flow continuously into any water-closet pan or urinal are prohibited. [No pipe by which water is supplied by the company to any water-closet shall communicate with any part of such water-closet, or with any apparatus connected therewith, except the service cistern thereof.]†

[Joint Committee and Conference.—That the regulation be struck out and the old regulations (Nos. 20 and 24) substituted.]

† 33.—Definition of water-closet.—The word "water-closet" in these regulations shall include any slop-hopper.

[Joint Committee and Conference.—(a) That the words "sink used for receiving any solid or liquid excremental filth" should be substituted for "slop-hopper" in Regulation No. 33.

(b) That words should be added to Regulation No. 33 to provide that the regulation shall not be deemed to entitle a water company to make a charge for supplying water to a "slop-hopper" or "sink used for receiving any solid or liquid excremental filth," as if such "slop-hopper" or "sink" were a "water-closet."]

Regulation 34, as proposed, is as follows:—

† 34. Water-closet Apparatus.—Every water-closet flushing cistern, or [water-closet] service-box hereafter fitted or fixed in which water supplied by the company is to be used, shall have an efficient waste-preventing apparatus so constructed and maintained as [not to be capable of discharging] to prevent the discharge of more than two gallons of water at each flush or a continuous flow of water, and shall not be automatic.*

The Joint Committee recommended as follows:—

(a) That the Council do express at the inquiry its view that water-closet flushing cisterns should be capable of discharging three instead of two gallons, but that having regard to the recent decision on this

question no evidence be called in support of the Council's view.

(b) That Regulation No. 34 should be struck out and the old regulation substituted.

Recommendation (b) was agreed to, but the following was substituted for (a):—

(a) That in the opinion of this conference owners and occupiers of property should be allowed to use three-gallon flushing cisterns if they so desire.

The following is proposed by the companies:—

† 35. Closet and Urinal Service Boxes.—Services (sic) boxes for closets and urinals, if made of cast-iron, shall be of approved design, and if of wrought-iron be galvanised, and constructed of sheets of a thickness of not less than 18 B.W.G., securely riveted, the pitch of the rivets not exceeding 1 1/2 in.; and they shall be provided with a close-fitting cover properly secured. Connecting links, between the levers and the valves, shall be made with suitable slotted, or knuckle joints, shall be made of brass and not be less than 3/4 in. diameter, and a brass plate with a square hole [for wrought-iron service box], or some equally efficient approved arrangement (for cast-iron service box), to prevent the ball-valve from getting displaced from its proper position, shall be provided. Balance weights shall be properly secured with 1/16-in. diameter wire; cotters or split pins, when used, shall be of brass, and not less than 3/4 in. diameter, and washers on service box valves shall be of the best rubber, and not less than 1/4 in. in thickness. Where a syphon is used in a service box, the undernath part of the syphon shall be brought above the top of the service box, and there shall be no opening or valve on the down leg of any syphon. The nuts for securing the syphon in position shall not have less than four full threads, and the "top water line" shall be cast upon the inside of each syphon service box on the back and the front, such water line being 1/2 inch below overflow pipe. Outlets from closet service-boxes shall not be less than 1 1/4 in. internal diameter, and of the weights and dimensions given below. [Here follows a table.—Ed.]

The Joint Committee recommended as follows:—

(a) That the words "which may hereafter be provided" should be inserted after "boxes" in line 2 of Regulation No. 35, and in such other lines as may be necessary for the purpose of making the regulation not retrospective.

(b) That the word "suitable" should be substituted for "approved" in line 3 of Regulation No. 35.

(c) That the words "three-eighths of an inch measured across the outside diameter of the link" should be inserted after "than" in line 11 of Regulation No. 35, in lieu of the words "3/8 inch diameter."

(d) That the word "approved" should be omitted from line 14 of Regulation No. 35, and the words "or painted" inserted after "cast" in line 28.

(e) That words should be added to Regulation No. 35 to provide that the supply pipe to the flushing cistern shall be of not less than a prescribed diameter so as to ensure the rapid filling of the flushing cistern.

The following was agreed to by the Conference: [That Regulation 35 be opposed with a view to its being struck out of the regulations; but in the event of the opposition being unsuccessful, the amendments proposed in recommendations (a),(b),(c) and (d) be pressed, and that in any case the proposal in recommendation (e) be pressed, and that in (e), after the words "supply pipe," the words "and union" be inserted.]

No recommendation was made by either Committee or Conference on the following:—

† 36. Water-closet down pipes.—Every "down pipe" hereafter fixed for the discharge of water into the pan or basin of any water-closet shall, when the bottom of the service box is more than 4 ft. above the top of the closet pan, have an internal diameter of not less than 1 1/4 in., and the outlet of the service box and the down pipe shall have an internal diameter of 1 1/2 in., when the bottom of the service box is less than 4 ft. above the top of the closet pan. The down pipe, if of lead, shall weigh not less than 9 lbs. to every lineal yard, may be of the weight prescribed in No. 28 of these regulations.*

The companies propose the following as Regulation 37:—

† 37. Urinal Service Box Apparatus.—Every urinal [cistern] service box in which water supplied by the company is used, other than public urinal [cisterns, or cisterns having attached to them a self-closing apparatus] service boxes, shall have an efficient "waste-preventing" apparatus so constructed and maintained as [not to be capable of discharging] to prevent the discharge of more than one gallon of water at each flush or a continuous flow of water, and shall not be automatic.

Outlets from urinal service boxes shall be made in accordance with weights and dimensions given for urinals and lavings in No. 18 of these regulations.*

* Words omitted from the old regulations are shown between brackets and the words added are in italics. † The whole of this regulation is new. ‡

The Joint Committee recommended and the Conference agreed to the following:—

(a) That the words "which may hereafter be provided" should be inserted after "service box," and the words "for each urinal or urinal compartment" inserted after "flush."

(b) That the words "(except when the water is supplied by measure)" should be added after "flow of water," and the words "and shall not be automatic" omitted.*

The companies propose:—

† 38. Automatic Flushing Boxes Prohibited.—No apparatus capable of discharging automatically shall be fitted or fixed except by special agreement with the company in writing under the hand of their secretary.*

The Joint Committee recommended:—

"That the words 'when water is supplied by measure' should be inserted in place of all words after 'except.'"

The following, however, was the resolution of the Conference:—

"That the words 'when water is supplied by measure or' should be inserted after 'except.'"

That the words "under the hand of their secretary" should be omitted.

That words should be added to the regulation to provide that in the event of the company refusing to allow automatic flushing apparatus there shall be an appeal to the local sanitary authority, whose decision shall be final.

The companies propose the following as Regulation 39:—

† 39. Bath Apparatus.—In every bath hereafter fitted or fixed, the outlet shall be distinct from, and unconnected with, the inlet or inlets. The inlet or inlets must be placed so that the orifice or orifices shall be at least 3 inches above the [highest water level] warning pipe or top of the bath, and the outlet of every such bath shall be provided with a perfectly water-tight plug, valve, or cock.*

[The Joint Committee recommended and the Conference agreed that the regulation be struck out and the old regulation substituted.]

The companies propose the following as Regulation 40:—

† 40. Bath to be without Overflow Pipe.—No bath or fixed basin supplied with water by the company shall have any overflow waste-pipe, except it be so arranged as to act as a "warning-pipe."*

[The Committee and the Conference agreed that the regulation should be struck out.]

Regulation 41, as proposed, is as follows:—

† 41. Alteration of Fittings.—No alteration shall be made in any fittings in connexion with the supply of water by the company, without [two] three days' previous notice in writing to the company.*

[The Committee recommended that the following words should be inserted after the word "company" in line 3 of Regulation No. 41, viz.—"Except such repair or replacement or alteration as may be necessary to prevent leakage, waste, or damage by water."*]

The Conference agreed to this with the following addition:—"That 'two' be retained instead of 'three' in line 3 of the regulation."†

The next proposed regulation is:—

† 42. Existing Fittings.—All existing fittings, which shall be sound and efficient, and are not specifically required to be removed or altered under these regulations, shall be deemed to be prescribed fittings under the Metropolitan Water Act, 1871; but when any such fittings become defective and cannot be efficiently repaired, they shall be replaced with fittings as prescribed by these regulations.*

[The Committee recommended and the Conference agreed that the words "and are not specifically required to be removed or altered under these regulations," and all the words after "871" should be omitted, and that the definition of "fittings" given in Section 3 of the Metropolitan Water Act, 1871, should be added.]

On the following proposed regulations neither the Committee nor the Conference had any recommendations to make:—

† 43. Penalties.—Every person who shall wilfully violate, refuse, or neglect to comply with, or shall wilfully do or cause to be done any act, matter, or thing in contravention of these regulations, or any part thereof, shall, for every such offence, be liable to a penalty in a sum not exceeding 5l.

† 44. Authorised Officer may Act for Company.—Where under the foregoing regulations any act is required or authorised to be done by the company, or approval or consent given, the same may be done or given on behalf of the company by an authorised officer or servant of the company, and where under such regulations any notice is required to be given by the company, the same shall be sufficiently authenticated if it be signed by an authorised officer or servant of the company.*

* Words omitted from the old regulations are shown between brackets and the words added are in italics. † The whole of this regulation is new.

* Words omitted from the old regulations are shown between brackets and the words added are in italics. † The whole of this regulation is new. ‡ In the old regulation the word "all" was used instead of "every," and the consequential alterations made.

But the Conference passed the following general resolutions:—

* That a regulation be added that in case of frost the companies shall be required to erect stand-pipes in convenient places for all consumers.

That this Conference asks the London County Council to take all steps that may be necessary to obtain the amendments to the proposed regulations now determined by the Conference.

That this Conference supports the recommendation of the London County Council, that if these alterations are made the cost of making them should be borne by the companies."

The Conference then concluded.

Illustrations.

ST. PETER'S AND BERNINI'S COLONNADES.

HIS view of the great basilica and the converging colonnades of the approach, though familiar enough to most of our readers, may be of interest taken in connexion with Professor Aitchison's Royal Academy lecture reported in another column. We see here the work of three of the architects who were connected with St. Peter's. The dome is Michelangelo's, or at least from his design, though only carried up to the cornice of the drum in his lifetime; the façade is Carlo Maderno's; the flanking colonnades are Bernini's.

The view gives the opportunity of showing how much the exterior effect of the dome, as the dominant feature of the whole, suffers, even when seen from the further side of the square, by the lengthening out of the nave, though it may be admitted perhaps that the interior effect is added to by the vista. As the dome is perhaps the most beautiful of the large domes of the world, so the façade is one of the worst of any great cathedral in the world, being entirely destitute of coherence or power of design, and impressive solely from its immense scale.

COURTYARD AND CASTLE TOWER, MILAN.

THESE illustrations represent the courtyard of the Archbishop's Palace at Milan, and two views of one of the towers of the Castle, the latter a modern restoration carried out under Signor Moretti, the architect to the municipality. They are both referred to and described in the first article in the present issue.

DESIGN FOR AN ENTRANCE GATEWAY TO A PUBLIC PARK.

THIS design, by Mr. Ralph Knott, was submitted in competition for the Tite prize given by the Institute of Architects, and received the second prize of ten guineas. Without any disparagement to the design which received the first prize, which is also a good one and which we shall have the pleasure of publishing, we considered from the first (after a long and careful examination of the drawings) that this was the best design, and we therefore give it the first place in publication.

The object of the Tite prize should not be merely correctness in the application of Italian details, but the study of this type of architecture with a view to its further development, and this object seems to be attained in Mr. Knott's design, which, though entirely founded on Italian architecture, has nevertheless a certain degree of novelty, and agreeable novelty, especially in the treatment of the accessory ironwork. The centre block of the gateway, with its sculptural decorations, is also exceedingly harmonious and well balanced.

Mr. Knott writes, in explanation of his intention in the design—"The centre gateway is for Royal or otherwise important processions, the others, on either side, are to be 'In' and 'Out' respectively, the pedestrians' entrances being kept well away to avoid mud, splashes, &c. The curved plan has, I think, the advantage of allowing people full warning of approaching carriages. I have purposely omitted any lavatory accommodation or attendants' quarters, as I consider it would have been little the elevation; but there is ample room in the semicircular space in either pedestrians' entrance for a chair for the gate attendant in wet weather."

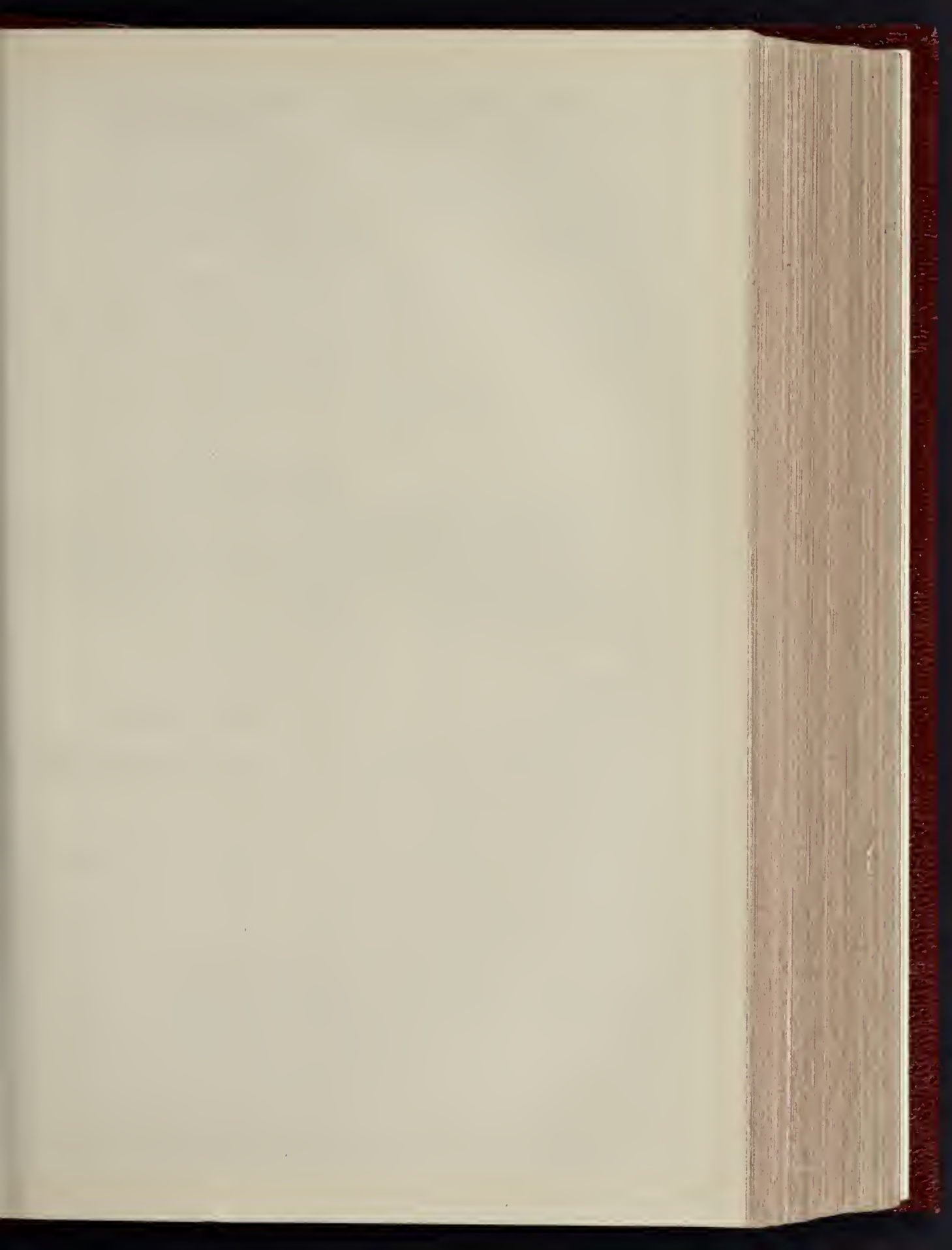
ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on the 30th ult., Dr. W. de Gray Birch, F.S.A., in the chair, Mr. R. W. Forster gave a lecture upon the Roman Wall, illustrated by over fifty lantern slides, many of which were prepared specially for the purpose. After a short description of the situation and design of Hadrian's Wall, and a brief statement of the questions concerning the wall and the earthen vallum, the views were shown illustrating the chief portions which still remain. The series began with the most easterly fragment of the wall, near Heddon; and this was followed by three views near Downhill, in the neighbourhood of Corbridge, where the vallum makes a sudden bend and skirts the south side of the hill, while the wall keeps to the northern brow. At this point an ancient road has recently been discovered, cutting through the vallum; and it has been suggested that the road is Roman, and the vallum therefore of earlier date than the wall. Downhill, however, has been extensively worked for limestone at an early date, and it is hardly possible to assign a definite date to many old roads and tracks which lead to it. Even if the road in question be Roman, the lecturer considered that fact did not prove what is alleged; for the Roman occupation lasted for nearly three centuries, and probably the vallum was not kept in repair after the province south of the barrier had settled down. Several views were shown of the remains at Cilurnum (the Chesters), including the flagstone pavement recently exposed in the Forum, from which inscriptions may be possibly recovered, if the lower sides of the stones are examined: also the larger eastern gateway, with the wall coming up to its southern side, so that this gate, as well as the north and main west gates, opened on the northern side of the defences, possibly to enable cavalry to issue with greater speed from the fortress. Cilurnum was garrisoned by the second *ala* of Asturians. Views were shown of the large suburban building between Cilurnum and the North Tyne, which has been described as a bath or a temple, but was probably a villa. The largest chamber has a row of seven niches, which perhaps originally held statues representing the seven planets and the seven days of the week; in size and in appearance they resemble the niches of the reliefs discovered at Plumpton in 1813, which represent five of those deities (see "Lapidarium Septentrionale," p. 411, No. 805). Another view showed the alcove opening out of the long chamber, with the lower part of its window, below which many fragments of glass were found. At the back of the villa is a space bounded by three walls and open behind; it seems to have been roofed over, and in one corner is a hatch or small window, opening on the floor level of one of the rooms within, and below this hatch the hypocaust is brought outside the building, forming a kind of table. It was suggested that this space was the kitchen of the villa and that the hypocaust formed a kind of "hot plate" on which the dishes were placed before being passed through the hatch to the triclinium. A series of views of Borcovicum were next shown, beginning with the gate in the valley on the east of the fort, formerly supposed to be a means of access to the so-called amphitheatre on the north of the wall. This, however, has recently been proved to be merely an old quarry, and the purpose of the gate was evidently strategic. Views of the east, west, and north gates of the fortress were exhibited, as well as of the recently excavated prætorium and the fine water tank in the south-east corner. Views of the Housesteads Mile Castle, showing how the massive north gate was partially walled up during the latter part of the Roman occupation, and several views of the remains of the wall on the basal hills besides the Northumbrian lakes, were shown. Attention was directed to the manner in which, at the gaps in the line of hills, the wall is drawn back so as to command both flanks of an attacking party, and also to the sudden changes of thickness which occur at many points. Dr. Bruce's theory, that these show the places where the working parties joined up their sections, seems insufficient. As a rule the insets go in pairs forming a shallow recess in the south side of the wall, generally less than a foot deep, and from 20 to 200 ft. long; and in many cases the lowest course is

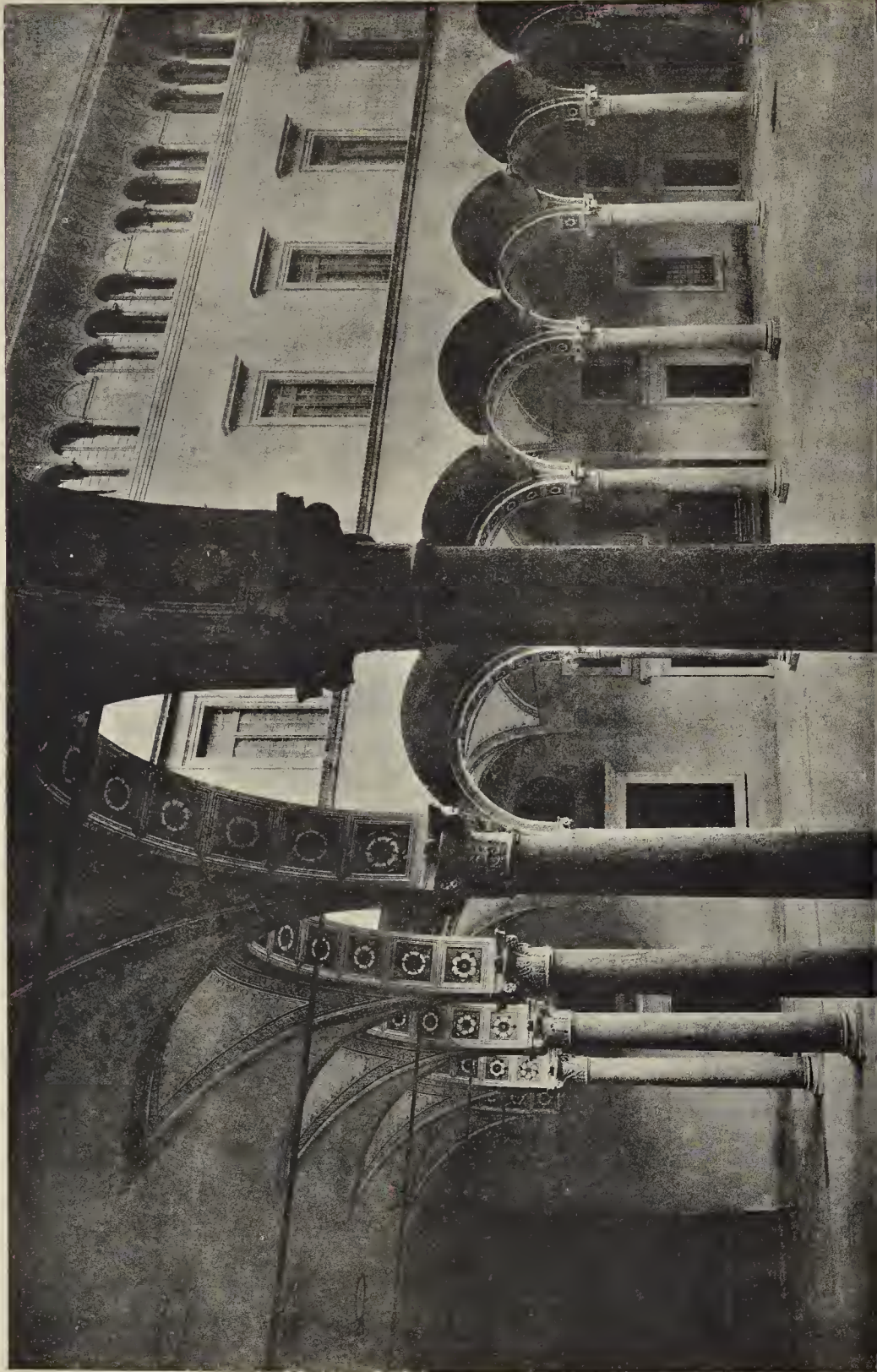
not set back at all. Just east of the Housesteads Mile Castle the breadth of the wall changes seven times in 130 ft. The series of views ended with that of the last fortress, of which the name can be identified. In view of the forthcoming Congress at Newcastle-on-Tyne the lecture was much appreciated.

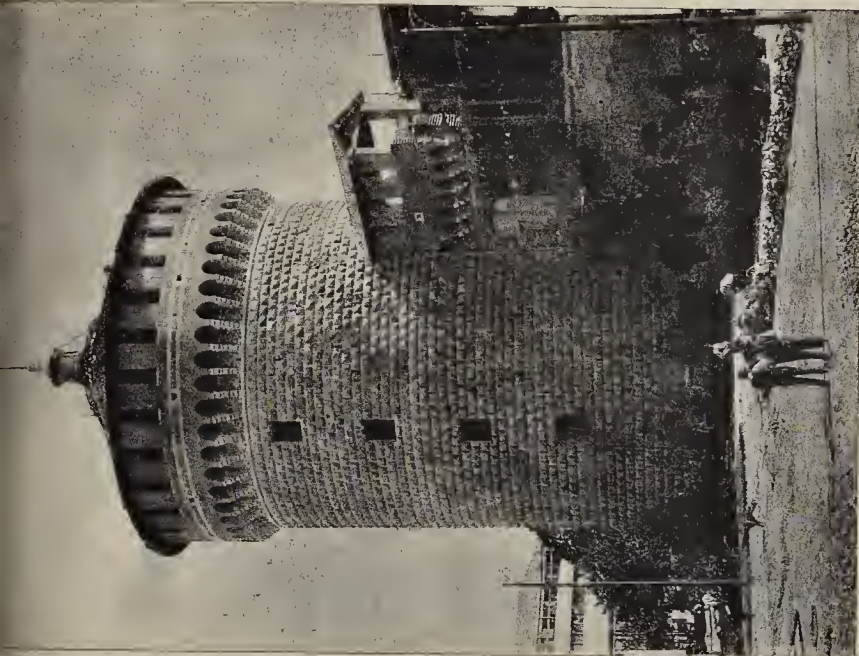
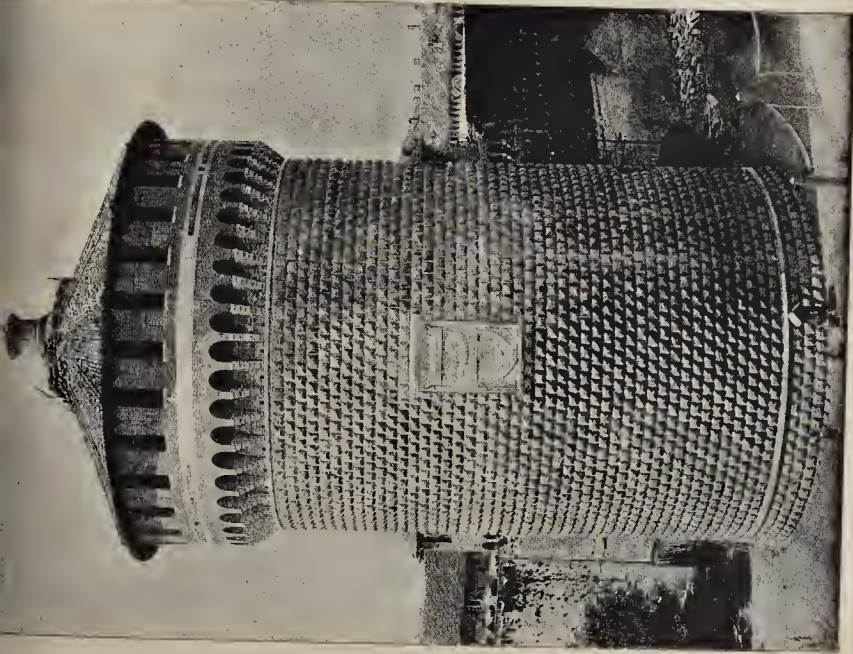
ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, February 4, at the Royal United Service Institution, Whitehall. Mr. Henry O'Connor, the President for 1900, occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. Henry C. H. Shenton for his paper on "Recent Practice in Sewage Disposal"; the Bessemer Premium to Mr. Richard F. Grantham for his paper on "The Closing of Breaches in Sea and River Embankments"; a Society's Premium to Mr. C. Rous-Marten for his paper on "English and French Compound Locomotives"; and a Society's Premium to Mr. Robert Henderson for his paper on "Paper-Making Machinery." Mr. O'Connor then introduced the President for the present year, Mr. Charles Mason, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. Upon the motion of the President a resolution of sympathy and condolence with the King and Queen and the other members of the Royal Family upon the death of her Majesty Queen Victoria, and expressive of loyalty to the Throne, was unanimously passed. The President then proceeded to deliver his inaugural address, in the course of which, although not making a review of the engineering profession during the past 100 years the main subject of his address, he dwelt briefly upon the marvellous progress made, instancing works of the present day as compared with those designed for the same objects at the commencement of the century. The President then proceeded to review the progress of the Society, which was founded in 1854 with about 100 members, and which now numbered 500 members and associates. The financial position of the Society was also favourable, there being a substantial excess of income over expenditure, and an extremely satisfactory accumulated fund. The practice of a municipal engineer was then referred to, with special reference to work in large towns, and surprise was expressed that more headway had not been made with regard to the general adoption of a scheme of subways for drain-pipes, &c., in London, the few now existing being frequently too small for the purposes they were intended to serve. An ideal subway was described by which the entire width of the street should be occupied. The science of heating and ventilation was discussed with special reference to domestic heating, and to the small extent to which well known and efficient systems of heating had been adopted in private houses, old associations and cheap fuel being the prime causes for want of progress in the matter. The advantages and disadvantages of warming by steam hot water, and hot air were stated, the President pointing out that it was impossible to adopt the same principle for all buildings. Steam, he said, as a heating medium, was not adapted for warming private houses, churches, or institutions where skilled labour was not permanently employed. In such buildings low-pressure hot water formed a far better system, being more easily managed and not requiring such constant attention. The President concluded by briefly referring to ventilation as being closely allied to and dependent upon heating; the introduction of an ample supply of pure fresh air being the main consideration in arranging any system (whether natural or mechanical), without allowing such air to become overheated or to cause draughts on its admission into the apartment. Want of attention in the working of an apparatus after it had been installed was the chief cause of inefficient working. It was often the case that in a ventilating plant the air flues and inlets were seldom properly cleaned, and a thoroughly efficient heating apparatus might often be condemned through inattention to small details in management, such as regulating valves and cleaning flues, the engineer receiving the blame which should be bestowed on the caretaker.



THE BUILDER, FEBRUARY 9 1901.





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

THE COURTYARD OF THE ARCHBISHOP'S PALACE, MILAN; AND ONE OF THE TOWERS OF THE CASTLE.

AS RESTORED UNDER SIGNOR MORETTI, OFFICIAL ARCHITECT.

THE INSTITUTION OF JUNIOR ENGINEERS.—The first of the series of six lectures on "Works Management" was delivered at the Westminster Palace Hotel on Tuesday evening, February 5, by Mr. A. H. Barker. The appreciation of the arrangements made by the Institution for the delivery of these lectures was manifest from the very large number present. The Chairman, Mr. Percival Marshall, in opening the proceedings, referred to the opportunities which those attending would have in the discussion at the close of each lecture for obtaining special information bearing on their own particular work. The lecturer's introductory remarks dealt with the general state of organisation in this country, with special application to engineering firms. The causes of our present position in the market, questions of experience, and selling power of products were then treated. The best methods for dissection of orders and of providing continuous work for operatives engaged attention. An analysis of the number of employees in different shops and of machines used followed, with prices of equipment. Some valuable curves were exhibited showing the relative cost in each case of machine tools, fitters' tools, &c. The questions of buildings, driving power, electrical *versus* mechanical driving were considered; and the lecturer concluded with some figures relating to the determination of various particulars in connexion with the size of steam-engines and boilers. Mr. Barker supplemented the lecture by further information in reply to questions put to him at the close. The next lecture takes place on Wednesday, February 20.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Hackney Borough Council 9,750l. for street improvement and paving works; the St. Pancras Borough Council 850l. for electric lighting of public buildings; the Shore-ditch Borough Council 4,460l. for paving works; the Hampstead Borough Council 17,220l. for electric light installation; the Hammersmith Borough Council 2,220l. for underground convenience, and the School Board for London 200,000l. for schools, &c.

The Horniman Museum.—The Chairman read a letter which he had received from Mr. E. J. Horniman, who said he was empowered by his father, Mr. Frederick John Horniman, M.P., who is now travelling in the East, to offer as a free gift to the people of London some 15 acres of freehold land, together with the museum which had just been erected at the cost of about 40,000l. In it were placed the large art and natural history collections gathered by Mr. Horniman during the last twenty-five years. The property is situated close to Lordship-lane Station on the South-Eastern and Chatham Railway, and about three-quarters of a mile from Forest Hill Station on the London, Brighton, and South Coast Railway. It consists of a large house known as Surrey Mount and some 9½ acres of pleasure grounds on the summit and slope of a hill commanding extensive views over South-Eastern and South-Western London.

On the motion of Mr. Torrence, the Vice-Chairman, seconded by Mr. Fletcher, Deputy-Chairman, it was agreed that the offer be accepted, and that the thanks of the Council be communicated to Mr. Horniman.

Tramways.—The Highways Committee recommended, and it was agreed, that the Council do approve the estimate of 7,900l., submitted by the Finance Committee, in respect of the cost of construction of the new tramways in Crowndale-road, Agincourt-road, and Constantine-road, authorised by the London County Tramways Act, 1900; and that the Highways Committee be authorised to arrange for the carrying out of the work by the Council's tramway department and under the supervision of the tramways manager.

The Proposed New Water Regulations.—The Water and Public Health Committee brought up a joint report on the proposed amended regulations of the metropolitan water companies. The recommendations of the report were submitted on Monday to a conference of local representatives, and were endorsed with

a few emendations, as will be seen from our report of the conference on another page.

Mr. McKinnon Wood, Chairman of the Joint Committee, moved the reception of the report, and stated that the conference was unanimous in condemning these regulations, and especially that which required that every house, flat, and tenement should have a cistern. The Local Government Board were opening an inquiry into the regulations on Monday next, and it was highly important that the County Council should express its opinion upon them.

Mr. Beachcroft thought some of the proposed regulations might be useful.

Mr. Webb regarded them as an infamous attempt to put the householders of London to a great expense.

Mr. H. Clarke was in favour of opposing that attempt to the utmost.

Mr. Westcott regarded it as scandalous.

Mr. Benn said that the new regulations were part and parcel of the system of persecution which the London consumers had suffered at the hands of the water companies for many years.

Mr. Shaw-Lefevre doubted whether it was lawful to compel persons to again provide themselves with cisterns. The action of the water companies was a move in anticipation of purchase, for the direct purpose of increasing the value of their property.

Mr. Burns, M.P., rejoiced that the plucky crusade of the London County Council against the water companies for the past twelve years had been endorsed by a representative body of delegates from the City and the Local Authorities of London.

Mr. Harris said that some of the regulations were possibly of a useful character, but many of them were, to say the least of it, a rather large order. Moreover, in view of the present position of the London water question, this was a very inopportune moment to bring them forward. On those grounds, he was generally opposed to the regulations, and supported the request that the inquiry should be adjourned.

The Council proceeded to discuss the recommendations of the Joint Committee, *seriatim*. The most important related to the proposed regulation requiring the provision of cisterns, which the Joint Committee recommended should be opposed at the inquiry, with a view to its being struck out.

Mr. Beachcroft suggested that the Council should not oppose the regulation, except to prevent its being made retrospective. If an effort was to be made to introduce sanitary cisterns, the Council ought not to be the body to resist it.

Mr. Emden regarded the system of cisterns, especially in the smaller houses, as an absolute death-trap. No form of cistern had been invented which could be always kept from fouling.

Mr. McKinnon Wood hoped the Council would speak with no uncertain voice upon this matter, and would support the unanimous conclusion of the Conference of Borough Councils.

Mr. Jeffrey said the object of the companies in reviving that iniquitous system was to get out of their obligations with regard to high pressure.

Dr. Longstaff thought there was more public danger arising from a temporary deprivation of water by a breakdown of the supply than from the use of cisterns.

The Council divided, with the following result:—For the recommendation, 99; against, 4.

The remaining recommendations were agreed to, with the alterations made at the conference the previous day.

Theatres, &c.—The following recommendations in regard to theatres, &c., were agreed to:—

Private Pass Doorway, Great Queen-street Theatre (Mr. J. Murray).

Reconstruction of the Imperial Theatre, Westminster (Mr. F. T. Verity).

Temporary building at the London Exhibitions (Mr. A. O. Collard).

Heating Arrangements, Wandsworth Public Baths (Messrs. Spalding & Spalding).

Housing: Churchway scheme, St. Pancras.—The housing of the Working Classes Committee reported that under the Churchway, St. Pancras, scheme, now being carried out by the Council under Part I. of the Housing of the Working Classes Act, 1890, the Council is required to provide accommodation on the cleared area for 580 persons, out of a total number of 1,095

persons thus displaced. Provision will, however, be made for 832 persons in dwellings to be erected on both sides of Churchway. Two houses in the block of dwellings which is being erected on the west side of Churchway will shortly be completed, and ready for occupation. The dwellings will be known as Wellesley Buildings, and will provide accommodation for 300 persons in 60 two-room tenements and 20 three-room tenements.

Subways.—Mr. Parker moved: "That it be referred to the General Purposes Committee to consider the best manner of bringing before the Borough Councils the imperative necessity of making subways under, at least, all the leading thoroughfares of the metropolis to contain all the gas and water pipes and telephone and telegraph wires; and, if necessary, to summon a conference to formulate some comprehensive scheme for remedying the scandalous and ever-increasing inconvenience to pedestrian, omnibus, and mercantile traffic caused by the constant tearing up of the footways and roadways for the purpose of inserting or removing the pipes, wires, &c., above referred to.

Mr. Baker seconded the motion, and it was agreed to.

The Council soon after adjourned.

PANAMA CANAL WORKS.

At an ordinary meeting of the Institution of Civil Engineers on the 5th inst., the President, Mr. James Mansergh, before beginning the ordinary business, proceeded to make known the terms of an address which it was proposed should be transmitted to his Majesty the King on behalf of the whole body of members of the Institution, expressing their profound sympathy on the death of the late revered Queen, and their loyal congratulations on his Majesty's accession to the throne. The address was adopted, *unanimously*, and the whole audience standing.

The paper read was on "The Present Condition and Prospects of the Panama Canal Works," by Mr. J. T. Ford, M.Inst.C.E. The paper began with a few remarks as to the general importance of the subject, and expressed the hope that the facts put forward might tend to modify the somewhat unjust estimate that had been formed of the character of the distinguished originator of the Panama Canal works, owing to the unfortunate cessation of work at the Isthmus. A short historical sketch of the work was then given, from its inception at the International Congress in Paris in 1879 down to the liquidation of the old company and the formation of the New Panama Canal Company under the auspices of the officers appointed by the French courts. The labours of the new company were discussed and classified under three important heads. First, the maintenance and recovery of all the plant, material, and buildings on the Isthmus that could be considered valuable on a resumption of the work at a future date. Second, the formation of a Technical Commission of Engineers, to make surveys in detail, borings, and meteorological observations; to determine the feasibility of otherwise of the Canal under any plan of construction; and to submit to the company such plans as they would recommend for completion of the work, with full estimates, &c. Third, the prosecution of such excavation work on the Canal itself, principally on the great cuts of Culebra and Emperor, as would be not only substantial progress on the work itself under any plans that might finally be adopted, but might also serve to prove the perfect possibility of those great cuts which had been questioned, with the result that doubt had arisen as to the feasibility of the whole work. Further, to carry out the deepening of the channel in the Bay of Panama, and the construction of a large steel pier at that end of the Canal, so that vessels in the Pacific could come alongside, and in connexion with the Panama railway (principally owned by the Canal Company) an improved and more economical method of handling the traffic across the Isthmus could be established, to the benefit of the Canal enterprise itself during the continuance of the work of construction.

The subject of the present position of the Canal works and their future prospects was then dealt with under the following five headings, the conclusions therefrom being in the author's opinion generally favourable to the continuance of the work:—(1) The present

condition of the works, after their practical abandonment and neglect for upwards of eight years, in its bearing on the question of the stability or permanency of such work in that particular region, in the event of the Canal being completed; also, the present condition of encampments, and provision for the large number of labourers to be employed on different sections. (2) The fitness for service in the continuation of the work of the existing plant, machinery, and materials generally, judging from their condition to-day as to state of preservation, more or less obsolescence of pattern, &c., and the extent to which new material would be required. (3) The extent to which the investigations and published reports of the New Panama Canal Company inspired confidence in the solution of the physical and technical problems admittedly left doubtful by the old company, and the nature of the essential points that caused adverse criticism and differences of opinion among eminent engineering authorities as to the possibility or otherwise of constructing the Panama Canal at all. (4) A general description of the essential features of the plans finally adopted by the International Commission of Engineers, invited by the new company to decide upon various projects after making their own independent and detailed investigations, with dimensions of the several sections of the work, &c. (5) The author's estimate of the proportion of the total work already completed, the time required for completion, and the reasons for such conclusions.

It was stated that the works were in far better condition than was generally supposed, even the maritime or sea-level sections—those most exposed to tidal and flood damages—having suffered but little. Further, that while a considerable amount of new plant would be required, there remained much that was still serviceable, as had been shown by the work accomplished by the New Canal Company. With regard to the inherent difficulties to be encountered in the construction of any canal at Panama, whether at sea-level or with locks, the author expressed the opinion that a sea-level canal, although it would be extremely costly, would be in every sense feasible, and would certainly be the ideal solution of the problem. The three main difficulties of a canal at Panama were:—The question of water-supply for lockage purposes during the dry seasons; the control of the Chagres River during its flood seasons; and the nature of the material encountered at the great cuts of Culebra and Emperor.

These three important questions having been thoroughly and exhaustively examined with actual experimental work under practical conditions, a favourable solution to all of them had been given by three alternative plans submitted to the company, all equally feasible, for a lock-canal with the summit-level at 126 ft., 98 ft., and 62 ft. respectively above sea-level; one of these, the medium plan, with summit elevation at 98 ft., was recommended. The author strongly urged the superior advantages of the lower plan with summit-level at 62 ft. above sea-level in opposition to the plan recommended by the Commission. A full description was given of the route and engineering features of the plan adopted, the general lines of which were identical for all three projects, except in the important feature to which the author objected, viz., the auxiliary supply canal from the storage reservoir above the Alhajuela dam to the summit-level of the Canal. This feature would be eliminated with great advantage by the adoption of the 62-ft. level.

The author was of opinion that, assuming the Canal to be completed according to the plan proposed by the Commission (and taking into account the general work done, not only in excavation proper, but in the establishment of existing conditions on the Isthmus, opening up and improving sanitary conditions, settlement of a permanent population as a nucleus for the labour supply, &c., &c.), the effective work already accomplished on the Canal fairly represented a sum of money equal to the amount still to be expended, according to the estimate of the Technical Commission, for completion, and that the Canal could be completed in eight or ten years; hence one-half of the Panama Canal might be considered as already completed, in spite of the admitted extravagance and errors of the old company. The author's reasons for this conclusion were given at some length.

The paper concluded with some general remarks as to the existing sanitary conditions

of the Isthmus of Panama, showing great improvement in recent years, as a result of the Canal works; and without entering into any comparisons with other proposed routes for a canal across the Central American Isthmus, the author was of opinion that at no place other than Panama could a canal of equal capacity and general advantages as to stability, low cost of maintenance, facility of transit, and safety and sufficiency of harbour accommodation at both ends be completed for the same cost or within the same period of time. In an appendix to the paper a summary of quantities and items of expense included in the 20,816,000l. needed to complete the work was given, extracted from the published reports of the Technical Commission.

NATIONAL SOCIETY FOR CHECKING THE ABUSES OF PUBLIC ADVERTISING.

THE above-named society, known among its adherents briefly as "S. C. A. P. A.," has issued to its members (who now number about a thousand) the following circular, which may be very well worthy of attention beyond the limits of the Society:—

"1. Camp View, Wimbledon Common. The approach of an election for the County Council offers to our London members an opportunity of doing substantial service.

As a result of efforts made by those interested in diminishing the grosser forms of advertising disfigurement, the Council have—

1. Absolutely prohibited sign-s.
2. Refused to allow advertising in the tramcars on lines under their control.
3. Passed by-laws enabling the Council to forbid flash-lights and illuminated advertisements where they are dangerous to traffic.

You will see that the Council (except in the management of their own property) confines its assumption of power to cases where it is possible to suggest that there is danger to 'life or limb.' We believe that there has been a very strong feeling in the Council in favour of checking, on purely "aesthetic" grounds, the present tendency to destroy the architectural propriety and dignity of London. But to enable them to make suitable regulations, special legislation would probably be necessary, and owing to the claims of other far more contentious topics, our views, though theoretically commended, have been in practice neglected. This will not be the case in the Council which has to be elected in March next, if in the meanwhile our members and friends do their duty as electors or as residents. We believe that when the Council has distinct evidence of the strength of the feeling existing on the subject, they will be glad to take action for obtaining statutory powers.

Edinburgh set the example in 1899, when, in spite of the interested opposition of some trade associations, Parliament gave it adequate rights of control. Dover, Chesterfield, and (in a less degree) many other municipalities are applying this year for similar authority. London, we are convinced, has only to ask to obtain. But the first stage is to impress upon all candidates that the question is regarded as serious and urgent.

It is suggested by one of our many friends in the Council that at meetings held to promote the interests of candidates the following or some similar question should be handed in writing to the chairman, and that a definite answer should be obtained from the candidate or candidates:—

'Are you in favour of measures to check advertising disfigurement in the metropolis?'

We do not ask you to make your vote or your support dependent upon the view the candidate may take, but we may safely say that evidence of genuine interest in our aims ought to count as a virtue.

We are only too well aware that many quiet-loving citizens find it distasteful, and that others are too busy to attend to municipal affairs. But we would urge that it is only by using personal influence to secure the best order of representatives that the better standard can be made to prevail. The labours which have for many years been devoted to the development of a sound opinion on the disfigurement question can be rendered effective only by the co-operation of members within their several spheres of individual action.

ALFRED WATERHOUSE, R.A., President,
RICHARDSON EVANS, Hon. Secretary."

BAPTIST CHAPEL, HORFIELD, GLOUCESTERSHIRE.—A Baptist chapel, in Brynland-avenue and Gloucester-road, Horfield, was opened on the 16th ult. Messrs. Drake & Pizey were the architects, their plans having been selected in competition. A clock which has been presented to the chapel was designed by Mr. Drake. The case was made by Mr. Ridd, and the works by Messrs. W. W. Kemp & Co., of Stokes Croft.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Hackney, North.—Eight houses, with bay windows on the east side of Upper Clapton-road, Hackney, between No. 174 and Moresby-road (Mr. G. H. Paine for Mr. C. C. Paine).—Consent.

Brixton.—A children's hospital on the east side of Clapham-road, Kennington, at the corner of Primaroad (Mr. H. P. Adams for the Committee of the Belgrave Hospital for Children).—Consent.

Greenwich.—A dwelling house on the south side of Manor-way, Lee-road, Lee (Mr. L. V. Hunt for Messrs. L. Whitehead & Co., Limited).—Consent.

Peckham.—Four houses with bay windows on the south side of Reynold's-road, Peckham-rye, Camberwell (Mr. A. Wood).—Refused.

Finsbury, East.—An entrance porch to Cocker's Hotel, Charterhouse-square, Finsbury (Mr. E. Haslehurst for Messrs. Wheeler & Warren).—Refused.

Finsbury, East.—An iron and glass pent roof in front of the City and South London Railway Company's station on the south side of City-road at its Junction with Moreland-street (Mr. T. P. Figgis for the City and South London Railway Company).—Refused.

Hampstead.—A one-storey office building on the south-west side of Belzise Park-gardens, Hampstead (Mr. A. F. Faulkner for Mr. W. Willett).—Refused.

Islington, North.—A one-storey coal-office building on the south-east side of Lennox-road, Islington, at the corner of Stroud Green-road (Messrs. Stevens Brothers for Messrs. Meyers, Gilson, & Rose).—Refused.

Islington, North.—One-storey shop additions to the flank of No. 122, Dartmouth Park-hill, Islington, to abut upon Langdon-road (Mr. C. Tupman for Mr. F. Bryen).—Refused.

Poplar.—Latrines and a caretaker's cottage at the northern end of Portree-street, Abbott-road, Poplar (Mr. S. L. Walters for Messrs. W. W. Howard Brothers & Co.).—Refused.

Projections.

Greenwich.—An iron and glass shelter over the entrance to Morton's Theatre, London-street, Greenwich (Mr. A. Roberts for Mr. A. Carlton).—Consent.

Islington, North.—The retention of bay-windows in front of Nos. 2 to 20 (even numbers only) Heathville-road, Islington (Mr. R. Midworth for Messrs. Wootton & Green).—Refused.

Marylebone, East.—That Mr. A. J. Hopkins be informed that the Council is not prepared to accede to his request on behalf of the Columbia Photographic Company for permission to retain three illuminated signs at the second, third, and fourth floor levels respectively in front of No. 122, Oxford-street, St. Marylebone.—Agreed.

Marylebone, East.—An iron and glass shelter at the restaurant entrance on the west side of the Hotel Great Central, Marylebone-road, to overhang the public way in Harewood-avenue (Colonel R. W. Edis for the Frederick Hotels, Limited).—Refused.

Wandsworth.—The retention of a bay window in front of a house known as Arran, Rutford-road, Streatham (Mr. J. W. Coates).—Refused.

Woolwich.—Bay windows to eleven houses on the north side and seven houses on the south side of Gatling-road, Plumstead (Messrs. Church, Quick, & Whincoop for Mr. T. Brandon).—Refused.

Width of Way.

Walworth.—An office building and a boundary fence on the east side of Hemp-row, Darwin-street, Walworth, at less than the prescribed distance from the centre of Hemp-row (Mr. L. H. de Pothorier for Messrs. T. T. Burton & Co.).—Consent.

Lincoln.—Two one-storey buildings on the south side of Cinnamon-street, Wapping, at the corner of King Edward-street, at less than the prescribed distance from the centres of those streets (Messrs. Barnes-Williams, Ford, and Griffin for Messrs. A. Jacob & Co.).—Consent.

Bethnal Green, North-east.—Twelve houses on the south side of Prospect-terrace, Usk-street, Bethnal-green, at less than the prescribed distance from the centre of Prospect-terrace (Mr. A. P. Stokes for Mr. C. Lacey).—Refused.

Fulham.—That Mr. W. D. Thompson be informed that the Council is not prepared to accede to his request on behalf of Mr. W. Maynard for permission to retain a one-storey stable and cart shelter at the rear of No. 101A, Fulham Palace-road, Fulham, at less than the prescribed distance from the centre of Lurgan-avenue.—Agreed.

Holborn.—Warehouses on the north side of Castle-street, Holborn, at less than the prescribed distance from the centres of Castle-street, Onslow-street,

and Great Saffron Hill (Mr. E. J. May for Messrs. Falk, Stadelmann & Co., Limited).—Refused.
Kennington.—A three-story building at Cumberland Works, Wigton-place, Milverton-street, Kennington, at less than the prescribed distance from the centre of Wigton-place (Mr. A. Parnacott for Messrs. Judge & Co.).—Refused.

Wandsworth.—Buildings and a boundary fence at Gothic Wharf, Brewhouse-lane, Putney, at less than the prescribed distance from the centre of Brewhouse-lane (Mr. S. J. May for Messrs. Carlo Gatti & Stevenson, Limited).—Refused.

Width of Way and Construction.

Holborn.—That the application of Mr. T. J. Anderson for an extension of the period within which the erection of oriel windows at the first, second, and third floor levels of an addition at the rear of No. 28, John-street, Bedford-row, Holborn, to abut upon Little James-street, was required to be commenced, be granted.—Agreed.

Line of Frontage and Construction.

Dulwich.—An iron and glass shelter to adjoin a bakery at the rear of No. 10, Alseyn-terrace, Park-road, Dulwich, at the corner of South Crooked-road (Mr. F. R. Bodley for Mr. L. French).—Refused.

Width of Way and Construction.

Holborn.—A play-shed at the school in Rosebery-avenue, Holborn, at less than the prescribed distance from the centre of Poole's-buildings (Mr. T. J. Bailey for the School Board for London).—Consent.

Woolwich.—An open cart-shed on the north side of Brewery-road, Plumstead, at less than the prescribed distance from the centre of the street (Messrs. Inskip & Mackenzie for Mr. C. Beasley).—Consent.

St. George, Hanover-square.—Retention of a wooden ticket-office in the yard of Victoria railway station, at less than the prescribed distance from the centre of a roadway (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Refused.

Formation of Streets.

Brixton.—That an order be issued to Messrs. Shoebridge and Rising sanctioning the formation or laying-out of two new streets for carriage traffic to lead out of Coldharbour-lane and Vaughan-road, Brixton, respectively (Mr. J. Pearman). That the names Vaughan-road (in continuation) and North lands-street be approved for the new streets.—Agreed.

Fulham.—That an order be issued to Messrs. Cluttons sanctioning the formation or laying out of new streets for carriage traffic on the London Bishopric Estate, Fulham Palace-road, Fulham, and in connexion therewith the widening and adaptation of a street for carriage traffic of Crabtree-alley (for the Ecclesiastical Commissioners). That the names Woodlawn-road (in continuation), Ellerby-street, Finlay-street, Greswell-street, Harbord-street, Inglethorpe-street, Kenyon-street, Langthorne-street, and Stevenage-road be approved for the new streets.—Agreed.

Height of Building.

Whitechapel.—A warehouse building on the north-east side of Middlesex-street, Whitechapel, at the corner of Cobb-street, to exceed in height the width of Cobb-street (Messrs. D. Cubitt Nichols, Sons & Chuter for Mr. R. Biggs).—Consent.

Working-Class Dwellings.

Bow and Bromley.—A further variation from the plans sanctioned on February 27, 1901, as modified by the plans sanctioned on January 29, 1901, for the erection of a laundry and a block of three intended dwelling-houses, to be inhabited by persons of the working-class, and proposed to be erected, not abutting upon a street, on a plot of land on the east side of Wellington-road, Bow-road, Bow, so far as relates to the erection at the premises of a building, to be used as baths (Mr. C. A. Brereton for the Whitechapel and Bow Railway Company).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

LAXTON'S PRICE BOOK FOR ARCHITECTS, BUILDERS, ENGINEERS, AND CONTRACTORS, 1901. (Simpkin, Marshall, & Co.)
 SILICO-CALCAREOUS SANDSTONES. By Ernst Stöfler. (E. & F. N. Spon.)
 A PRACTICAL TREATISE UPON STEAM HEATING. By Frederick Dye. (E. & F. N. Spon.)

STEPNEY PARISH CHURCH.—We read that the cost of the renovation of the parish church of St. Dunstan amounts to 5,426l. 17s. 3d., and that the whole of the money has been subscribed. The repairs, which include re-flooring, re-seating, and the removal of the galleries, were executed under the directions and superintendence of Messrs. J. E. K. & J. P. Cutts.

Correspondence.

To the Editor of THE BUILDER.

"BUILDING CONTRACTS FROM A BUILDER'S POINT OF VIEW."

SIR,—When reading Mr. Frank Cowlin's paper, as read before the Bristol Society of Architects on the 14th ult., and reproduced in your issue of 26th ult., I was much disappointed at the shortness and tone of his remarks in reference to clerks of the works.

I can truly say the clerks of works in Bristol and district are the representatives of the architects, and that they furnish all the information required for the due performance of the contracts, as far as my experience goes; and I am pleased to say I have carried out works as the contractor's representative in that part of the country as well as in other provincial towns and in London.

As Mr. Cowlin thinks the clerk of works deserves a paper to himself, I only hope he will give one, and I shall then have an opportunity of criticising it, which will doubtless lead to many improved methods of working by the builders and their agents or foremen.

It seems to me that much friction between the clerk of works and foreman would be prevented if only the builder was more in touch with his foreman. He would find that, instead of a discussion between the clerk of works and the foreman so often taking place, and also ending in personalities, that the materials in question need not have required all this wasted talk had he made a proper agreement with his merchant as to the quality of materials to be delivered, and to be to the architect's satisfaction. Why should the builder not bind his merchant to supply what he himself has already contracted to supply?

Then as to the quality of the work. I find that in nine cases out of ten when having complained to the foreman, and he has objected to my complaint, that his objection was entirely removed when I have suggested that if we (the clerk of works and the foreman) could not agree, then the matter in dispute should be referred to our respective employers—the architect and the builder—to settle. No clerk of works could object to any dispute being thus settled, and the builder and his foreman have an undoubted right to this course; and if it was more often adopted, I feel confident that a deal of unpleasant duty which now devolves on the clerk of works would be better understood by the architect. Also an unqualified clerk of works would be most easily put right.

I have most generally found the cause of slow progress with buildings to be due to the materials being brought late on the works. It often happens that builders altogether underestimate the time required by manufacturers to get special materials ready. Labour is most often a secondary consideration, and if a builder is anxious and able to carry out a contract quickly, it is absolutely necessary that he should get his materials on the site in good time, before they are required, as his foreman cannot very well be expected to tell his master, or the office, that they are keeping the job behind because the materials are being slowly delivered.

Then as to the clerk of works being responsible for the setting out of the building with the foreman, it should be remembered that a competent foreman, with assistance if required, will not allow the clerk of works the chance of finding the setting out incorrect when he checks it, as the clerk of works has his duties to perform, and cannot see the materials being delivered or built into position on one part if setting out on another.

I firmly believe the architect and builder will be brought more in sympathy with each other if they use the necessary tact when dealing with their respective representatives, the clerk of works and the foreman; and that if better prices are needed, builders should tender them, and above all see that, if first-class men are to be obtained as clerk of works and foreman, the salaries as at present paid by many must be much increased.

A CLERK OF WORKS.

THE LOCAL GOVERNMENT ANNUAL.—The issue for 1901 of this useful annual has been sent to us. It is the tenth issue of the work, which is published at No. 2, Dorset-street, Fleet-street, E.C. The directory portion gives the names and addresses of the chief officials of all Corporations, London Borough Councils, County Councils, Boards of Guardians, Urban and Rural District Councils, County and Borough Asylums, &c., throughout the kingdom, as well as the public libraries, public parks, and City companies of London. There is also much useful information relating to the public libraries, baths and washhouses, and electric light undertakings in the boroughs of London, and an abstract of the Local Government legislation of 1900. The charges for water and gas in London are shown, the population of the various provincial Unions is given, and a complete list of all the parks and open spaces for the metropolis, with the Local Authorities controlling them.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

6.—SINKS (continued).

THE name "combined sinks" is often applied to sinks containing more than one compartment, or containing a draining slab in addition to the sink. A double sink is undoubtedly a great advantage, as one compartment can be used for the preliminary washing of the crockery, &c., and the other for the cleaner process of rinsing, and two persons can work at the same time. Such a sink is illustrated in fig. 1, the front of each compartment being fitted with Twyford's inserted wood rim, which prevents damage being done to the enamel by heavy articles, and also reduces the risk of breaking or chipping the crockery which is being washed. One compartment has "snugs" formed for the reception of a draining-board, so that the sink can be used either as a double sink or as a single sink with draining-board. It is made in two sizes, 36 in. by 21 in. by 9½ in., and 48 in. by 21 in. by 9½ in., with raised back as shown, or with a separate back 18 in. high. Combined sinks of very large size are now made, either in one piece, or in two or more pieces joined together.

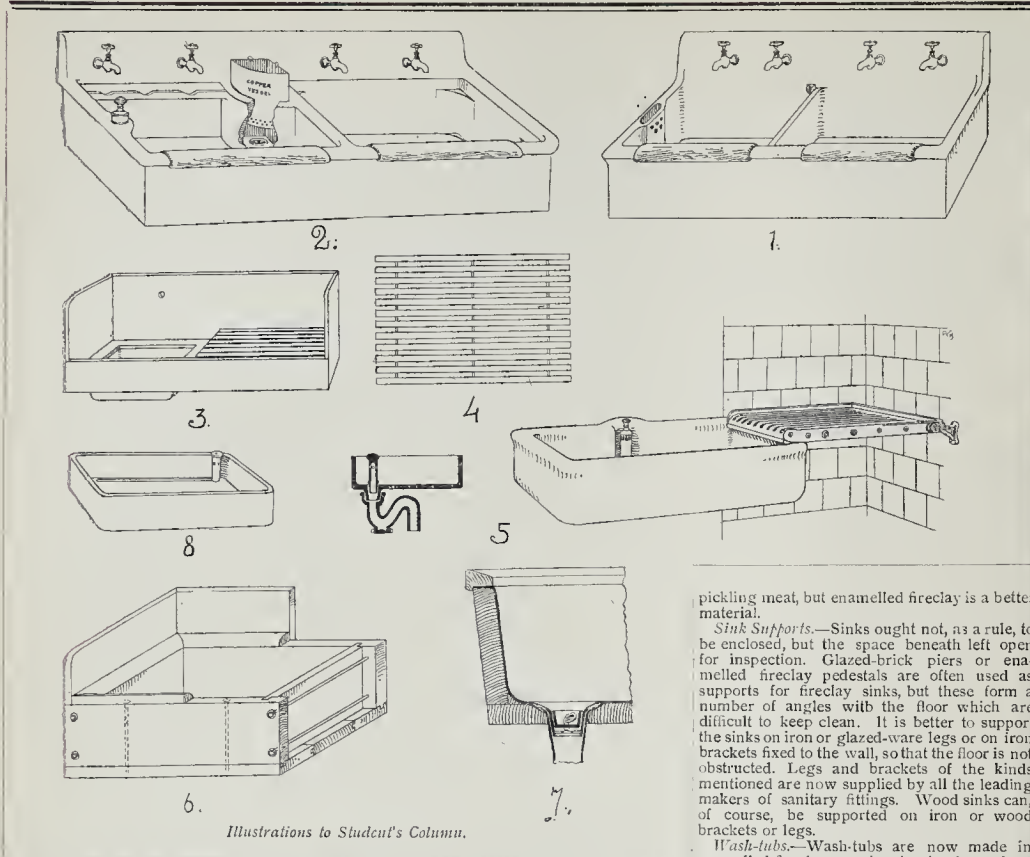
The "Beresford" combined butler's sink (fig. 2) has two compartments, one of which has widely-rounded corners forming seats for the reception of a wood drainer. This compartment has a 2-in. rubber plug with brass washer and union. The other compartment has a "Neros" standing waste and overflow, and a shelf for brushes, &c., is formed along the back. A separate compartment is formed in one corner to receive a perforated copper vessel for holding garbage; this compartment is fitted with a brass grate, so that the water draining from the garbage can escape. The sink measures 5 ft. by 2 ft. by 1 ft. and is made with a raised back as shown, or with a loose back 18 in. high.

A more ordinary form of combined sink is illustrated in fig. 3. This consists of an enamelled fireclay sink (about 22 in. by 18 in. by 13½ in.) with rubber slate or marble front and skirting, slate or marble drainer dish to the sink, and teak grating. The sink is fitted with 1½ in. vulcanite plug with brass washer and chain. The number of joints and the square angles formed by the slabs of slate or marble are objectionable features of this kind of sink.

Combined lavatories and sinks are now made in one piece of enamelled fireclay, and are often a convenience in butlers' pantries and other places, but they do not call for detailed notice.

A common complaint with regard to pottery sinks is that they are so hard and slippery that it is practically impossible to avoid breaking or chipping delicate crockery and glass which are being washed up in them. The pottery draining slabs of combined sinks, even when fluted, are a frequent cause of such damage. For this reason the draining slab is now generally covered with a wood grid or fluted drainer, and to prevent damage being done to crockery in the sink itself, the bottom of the sink is fitted with a loose wood grid (fig. 4). These grids are not expensive, and reduce the risk of breakages very considerably; they, of course, become foul sooner or later, and must then be replaced with new ones. The sink with hinged draining-board (fig. 5) is one of Shank's new designs; the sink has a standing waste and overflow, and is supported on galvanised iron legs, and the draining-board is made of separate pieces of wood bolted together.

Undoubtedly the hard and slippery surface of pottery sinks has had much to do with the retention of the wooden sink, either naked or lined with lead or copper. An unlined wooden sink (fig. 6) is specially adapted for washing very fragile articles, such as delicate porcelain ornaments and glassware, which are not seriously fouled, but it cannot be recommended for general work. The best woods for the purpose are birch, sycamore, and teak, but soft woods are sometimes used. The wood should be about 2 in. thick, and framed together with tongue and groove joints made water-tight with red and white lead. The whole should be secured with galvanised iron bolts with nuts and washers. A rounded capping may be fixed on the edges of the sink, and a skirting along the



Illustrations to Student's Column.

back and ends, as shown in part of the illustration. Triangular fillers are sometimes fixed in the angles with brass screws, in order to do away with the sharp corners. They should be thoroughly bedded in red and white lead. The sink may be about 2 ft. 6 in. by 1 ft. 6 in., and from 8 in. to 12 in. or 13 in. deep inside.

Of the two materials generally used for lining wooden sinks, lead is usually preferred on account of its greater softness. The objections to the material are that the bottom piece is apt to form into ridges in consequence of the expansion due to hot water, or to crack in consequence of the subsequent contraction. These defects can be in a great measure obviated by making the bottom piece very stout; the sides may be of 6 or 8 lbs. sheet lead, but the bottom ought to be of 10 or 12 lbs. lead. A further precaution is to make the sides slope outwards and to fix a feather-edged fillet in the angle, as this gives the lead more freedom for expansion. Sometimes the bottom, sides, and ends are in one piece, so that only the vertical angles need to be soldered, but this method cannot be recommended. More frequently the bottom and two sides are in one piece, and a separate piece is used for each end. When the bottom is of stouter material than the other parts of the lining, the front and one end will be in one piece, and the back and the other end in another piece. The front edge of the sink should be protected by a hard wood weathered capping to prevent the lead being damaged by pails, and the wood bottom should be dished out around the waste-hole, as shown in fig. 7. The vertical angles must be well rounded off with solder, and an overflow grate and pipe must be provided.

Copper is not so much used as lead for lining sinks, although it is more durable. The bottom may weigh 4 lbs. per sq. ft., and the sides about 2½ lbs. The lining is made independently with welded seams, and is then tinned to protect the surface of the copper and at the same time make the seams watertight. It is afterwards fitted into the wooden case. Copper sinks are sometimes hammered out of one piece, but

these are of round or oval form, like the bowl of a lavatory; they ought always to be tinned.

3. *Nursesmaids' Sinks.*—These are best made of white porcelain-enamelled fireclay, fitted with waste and overflow, and need not differ in design from some of the butlers' sinks already illustrated.

4. *Vegetable Sinks.*—These sinks are often made of galvanised-iron, or of cast-iron finished in one of the ways mentioned in the last article. They should be about 15 in. or 18 in. deep, so that the dirt can sink below the floating vegetables. The waste may with advantage be placed in a small compartment separated from the body of the sink by a perforated metal strainer, so that grit and garbage will not be carried into the trap. Where soft moorland water is used, the coating of zinc on galvanised iron is soon destroyed, and some other material should be used, such as slate or enamelled fire-clay. The deep fire-clay "wash-tubs" are very suitable for the purpose. Two compartments are of service, the one for the preliminary washing and the other for rinsing.

5. *Sinks for Washing Pans, &c.*—Sinks for this purpose are best made of galvanised wrought-iron, or of cast-iron finished black or galvanised. The depth will vary according to the maximum size of the pans in use, and as sand is generally used for scouring the pans, the waste-outlet ought either to be in the side of the sink a little above the bottom, or in a small compartment separated from the body of the sink by a finely perforated metal strainer.

6. *Special Sinks.*—As an example of a special sink, the laboratory sink illustrated in fig. 8 may be given. It has a porcelain standing waste and overflow, so that no metal whatever is exposed to the action of the acids which may be used in the sink. Porcelain traps and waste-pipes are made for use with these and other sinks. Other special sinks are made for the operating rooms of hospitals and for other purposes, but these need not be specially described. Slate sinks are sometimes used for

pickling meat, but enamelled fireclay is a better material.

Sink Supports.—Sinks ought not, as a rule, to be enclosed, but the space beneath left open for inspection. Glazed-brick piers or enamelled fireclay pedestals are often used as supports for fireclay sinks, but these form a number of angles with the floor which are difficult to keep clean. It is better to support the sinks on iron or glazed-ware legs or on iron brackets fixed to the wall, so that the floor is not obstructed. Legs and brackets of the kinds mentioned are now supplied by all the leading makers of sanitary fittings. Wood sinks can, of course, be supported on iron or wood brackets or legs.

Wash-tubs.—Wash-tubs are now made in enamelled fireclay, ranging in size from about 24 in. by 20 in. by 15 in. upwards. The fronts generally slope outwards, and should have a roll edge. The backs are often raised. Steeping troughs for laundries can also be obtained in enamelled fireclay up to 7 ft. by 3 ft. 6 in. by 3 ft.

OBITUARY.

MR. J. M. ROBERTSON.—Mr. John Murray Robertson, architect, of Dundee, died on the 31st. ult. at Crossmount House, Perth. Born in Strathord, Mr. Robertson was the son of Mr. James Robertson. His early days were spent at Blair Atholl and Dunkeld, and at the latter place he first went to school. On the death of his father deceased removed with the family to Perth, and was educated at the Free West Church School under the late Mr. James Moir, and latterly at the Perth Academy. In his sixteenth year he entered the office of Mr. Andrew Heiton, the Perth architect, with whom he remained for about fifteen years. Acting in the capacity of assistant architect and Inspector of Works, he first became connected with Dundee district while superintending the erection of Castle Roy, Broughty Ferry, the residence of Mr. A. E. Gilroy, of which Mr. Heiton was the architect-in-chief. Under Mr. Heiton he likewise had to do with the plans of Kinbrae, Newport, the residence of Sir John Leng, M.P., and of Westwood, West Newport. After these and other houses which Mr. Heiton had in hand were well forward to completion, Mr. Robertson resolved to commence business in Dundee on his own account. He quickly succeeded in establishing a large private connexion. While his work was chiefly of the domestic order, he was an architect of wide scope. Some of his principal public and other buildings include the Royal Exchange Shelter, the Caledonian Insurance Company's Buildings, the Caird Maternity Hospital, Fyvie's Buildings in the Nethergate, Lochce Public Baths and Library, the Technical Institute, additions to the University College, the Royal Victoria Hospital, &c., while among numerous private houses of which he was the architect may be mentioned Seathwood, Glamis House; The Cottage, Lochce; and The Buchties, Broughty Ferry. Last year there was completed a large addition to Glenstal Castle, County Limerick, of which he was the designer, and there is at present building a large house for a gentleman in Dunblane, the plans of which he prepared. He was likewise architect of the Consump-

five Home at present in course of erection at Barnhill Perth. Nor was deceased's work confined to villas and large public buildings. Late in the eighties he submitted designs for model houses for working men in a competition in connection with the Dundee Industrial Exhibition and took the first premium. Mr. Robertson was a Fellow of the Royal Institute of British Architects. To his intimate friends he was known as one of the bappest and most genial of men. Happy always while engaged in the pursuit of his calling, even his holidays were employed in study, and for this purpose he travelled considerably on the Continent, and was familiar with the principal architectural features of many of the notable European cities. His death at the comparatively early age of about fifty-six years will be greatly regretted, not only by all his professional brethren in the city, but by many others to whom he was known, and there will be general sympathy with the widow, son, and daughter by whom he is survived.—*Dundee Advertiser.*

GENERAL BUILDING NEWS.

REOPENING OF CONGREGATIONAL CHAPEL, KELVEDON, ESSEX.—This chapel was reopened on the 23rd ult., after renovation, &c. The old-fashioned, straight-backed pews have been replaced by sloping-backed seats, a pulpit has been erected opposite the gallery, and the organ has been placed behind it. The ceiling has been paneled, and a new front has been made for the gallery. The new woodwork is of pine. The Sunday school at the rear of the chapel has also been renovated. The works were carried out by Messrs. J. Smith & Son, of Witham, under designs by Mr. Charles Pertwee, of Chelmsford. The organ was removed and repaired by Mr. A. Hurst, of Long Melford; and Mr. J. Polley, of Kelvedon, carried out the lighting arrangements.

CHURCH, CASTLEBAR, CO. MAYO.—The new church at Castlebar is nearing completion. The high altar, and the stained-glass window above, have been placed in position. Mr. Walter G. Doolin is the architect.

INFANTS' SCHOOL, NETTLEHAM, NEAR LINCOLN.—An infants' school has just been opened at Nettleham. It will accommodate ninety scholars. Mr. H. H. Dunn, of Lincoln, was the architect; and Messrs. Bailey & Kirk, of Nettleham, were the builders.

BOAR'S SCHOOL AT WELLINGBOROUGH.—The new Board school in the Westfield-road, Wellingborough, was opened recently. The school now opened is to take the place of the present boys' school in Rock-street. It has been built from the designs of Mr. J. E. Cutlan, architect, Wellingborough, and has been erected by Messrs. Hacksley Bros., of the same town. The schools are arranged on the central hall system, and are built of red brick with Broseley tile roofs, Sibley facings being used for the south and west fronts, relieved with brick moldings and Bath stone. Access to the main entrance is from the Westfield-road, and this entrance opens into a vestibule, shut off from the passage leading to the central hall by a glazed screen. Leading from this vestibule is a flight of stairs to the first floor, which contains, besides a landing, a head-master's room, assistant teachers' room, lavatory, and two storerooms, and from this same landing access is also gained to a small balcony overlooking the whole of the central hall and some of the classrooms. Descending to the vestibule and passing through the swing doors in the screen, the scholars will pass to the entrance to the central hall, leaving the cloakroom, &c., to the left. The hall is 30 ft. long, 31 ft. wide, and 27 ft. high. The room is only half its intended length, and indeed the whole building as it stands is only half of what it will ultimately be, it being so arranged that the remaining half will be a duplicate of the present structure. The classrooms on either side of the hall are four in number—two to accommodate sixty children each, and two to accommodate forty children each—and from the south-west end of the central hall entrance is gained to two classrooms accommodating fifty children each, these latter rooms being provided with a sliding glazed partition which enables the two to be thrown into one as occasion requires. The classrooms are treated, so far as the walls are concerned, in similar manner to those of the central hall. The floors of the central hall and classrooms are laid with wood blocks of pitch-pine, the classrooms having galleries of the same material and are furnished with dual desks. The central hall is furnished with two museum cupboards. The classrooms are shut off from the central hall by wooden partitions which are two-thirds glazed. The playground is laid with asphalt, and on the northern boundary area is a playground and a barn, between them being placed the usual out-buildings. At the north-west corner of the buildings there is a flight of steps leading to the basement, which contains the heating apparatus and coal cellars. The heating of the building is by means of hot air, Grundy's system. The classrooms, central hall, and head-master's room are all fitted with electric bells.—*Northampton Reporter.*

FORESTERS' HALL, LEICESTER.—The foundation-stone has just been laid of a Foresters' Dispensary and Institute, which is to be built at a cost of 4,000, at St. Nicholas-street, Leicester. The architect is

Mr. A. Wakerly, of Leicester, the contractors being the Leicester Builders, Limited.

ELECTRIC TRAMCAR WORKS, MANCHESTER.—About five acres of land have been purchased in Trafford Park, Manchester, adjacent to the Ship Canal and the Railway Systems, by the British Electric Car Company of St. Swythins-lane, London. The works, which are capable of turning out 120 tramway cars at a time, have been designed by Mr. Charles Heathcote, architect, Manchester, and have been commenced.

BANK PREMISES, CAMBERWELL-GREEN.—New premises for the Camberwell branch of the London and County Banking Company, Limited, have been erected on the site of the old police-station at the corner of Camberwell-green and Camberwell New-road. The building is of Ancaster stone, with bands of Belgian blue stone and red bricks. The entrance is at the junction of the Green and Camberwell New-road, and is surmounted by a small tower and dome. There is a suite of rooms for the manager on the upper floors. The whole building will be lighted by electricity. Mr. Alfred Williams was the architect, and Mr. William Shepherd, of Bermondsey, the builder.

PLYMOUTH ROYAL EYE INFIRMARY.—The new building for the Plymouth Royal Eye Infirmary was recently opened. The new infirmary is situated near Mutley Station. It stands on a triangular-shaped piece of land, 1½ acres in extent, and the building faces a new road running westward from Mutley Station. It is in the Later Renaissance style and is built of red bricks, with Doulton stone dressings, and the roofs are covered with Broseley tiles. With regard to the arrangement of the building, the main entrance and administrative block are placed in the centre of the south front. This portion contains a large entrance hall, board-room, office, and matron's room, whilst from the main corridor separate stone staircases ascend to the men's and women's wards on the first floor. The western wing contains the nurses' dining-room, grocery and linen stores, and kitchen department. The dispensary, out-patients' waiting-room, doctors' consulting-room, small operating and ophthalmoscopic rooms are situated in the eastern wing, together with the steward's room, lavatories, and entry and exit lobbies for the out-patients. On the first-floor is the operating-theatre, which is centrally placed and has a large bay-window to give the maximum amount of light without shadows. Two large wards are provided in both the eastern and western wings. These are capable of accommodating fifteen male and fifteen female patients. They are entered from a wide ambulatory corridor, which faces south, and extends the whole length of the building, and is divided by glazed screens. Lavatories, bathrooms, &c., are provided in special wings at the south-east and south-west corners of the building, and there are also linen and clothes cupboards, ward kitchen, and other conveniences. On the second floor is an isolation ward for infectious cases, and bedrooms for the staff and servants, with bathroom, lavatory, linen and store-rooms. Hot-water radiators are placed in the corridors, halls, waiting-rooms, and entrances. The wards are heated by stoves, and patent fireplaces are fixed in the various rooms. Fresh air passages are connected with the radiators, and fresh air is brought in tubes to each fire grate and stove. Extraction shafts are arranged in the roof from the ceilings of the rooms and wards, and continued to air flues in the main chimney stack. The heating apparatus is situated in the basement. The hot-water service for domestic purposes is supplied from a separate boiler in the basement, and is continued through the kitchen department, lavatories, and bathrooms. Fire hydrants are placed on each landing. The building has been wired for electric light, and at present is lighted by incandescent gas. Lifts are arranged for luggage and dinner service to each floor, and in the kitchen from the basement. Electric bells connect the administrative portion with all rooms, and there are telephones for inter-communication on each landing. As falls rapidly from south to north, it was necessary to carry up the foundation walls to a considerable height to bring the ground floor on a level with the new roadway. By the advice of the architects, the committee made the best of this necessary expenditure on the foundations by erecting well-lighted and ventilated cellars under the whole building. Messrs. King & Lester were the architects of the building, and it has been erected under their supervision by Messrs. Laphorn & Co. The cost, including furnishing, was 16,568l. The boundaries are enclosed by wrought iron railing on the south front and by oak fencing on the north-east and north-west fronts.—*Western Morning News.*

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, DRIFHLINGTON, YORKSHIRE.—On the 20th ult. Mr. R. H. Bicknell held an inquiry at the offices of the Driflington District Council into an application by the Council to the Local Government Board for a provisional order empowering the Council to put in force, with reference to certain lands required by them for purposes of sewage disposal and situate in the parish of Tong, the powers of the Land Clauses Acts with

respect to the purchase and taking of lands otherwise than by agreement. An application by the Council for sanction to borrow 12,600l. for carrying out the scheme was also considered. Mr. G. B. Waugh, of Bradford, the engineer for the scheme, stated that he selected site for the sewage disposal works was nearly 6½ acres in area, and was on the north of the township boundary. It had been selected as there was not a suitable site within the Driflington district. The drainage would be by gravitation. The site had been recommended four years ago, but was abandoned because of the excessive price the owner of the land wanted for it. The scheme was opposed by Mr. Baird, a barrister-at-law, on behalf of Sir Robert Tempest, the owner of the land.

STAINED GLASS AND DECORATION.

WINDOW, ST. HILDA'S HOSPITAL, MIDDLESBROUGH.—The two-light window in this hospital has been filled with stained glass as a memorial window. The lower subject, through the two lights, is "Christ Healing the Sick." The upper subjects are, "King Oswy delivering his Daughter to St. Hilda" (A.D. 655), and "Cædman Reciting his Verses to St. Hilda" (A.D. 680). The window is from the studio of Mr. H. A. Hymers, of Chelsea.

WINDOW, ST. ANN'S CHURCH, WANDSWORTH.—A window in the Lady Chapel of this church has been filled with stained glass. The subject chosen is "The Madonna and Child," surmounted with a canopy. The work is from the studio of Mr. H. A. Hymers, Chelsea.

FOREIGN.

FRANCE.—A museum is to be formed in Paris, on the former site of the Ave Maria market, Rue St. Antoine, for the illustration of everything connected with hygiene, and the security of ateliers, shops, and manufactories.—The works for the enlargement of the Port of Dunkerque are to be commenced shortly. The operations will entail an outlay of more than two million francs.—M. Antonin Caries, the sculptor, is completing the model of the monument to Pasteur to be erected at Dôle (Jura). The design shows a woman embracing two children whose lives have been saved by Pasteur. At her side another female, symbolising Science, raises with an air of triumph, symbolising Science, towards Pasteur, whose figure, standing in a meditative attitude, forms the crown of the whole group.—A Committee has been formed, under the presidency of M. Bonnat, to erect a statue in memory of Antoine Vullon, the eminent painter.—M. Roty has completed a medal in commemoration of the centenary of the Bank of France. Another in honour of the rebuilding of the Théâtre Français has been completed by M. Chaplain.—M. Dalou has been modelled by M. Quiberon. On a pedestal cut in the rock the figure of the Republican General is shown standing, his hands crossed on the pommel of his sword.—M. Marceau has completed the statue of Daudet, to be inaugurated this year, and has been commissioned to execute a statue of Dumas fils. It represents, seated in a realistic costume, while the pedestal is surrounded by the figures of the heroines of his dramas. It is to be erected on the Place Malesherbe, opposite the statue of General Dumas which M. Moncel is modelling.—M. Henri Mayeux has been appointed architect to the National Factory of Sevres, in place of the late M. Paul Sédille.—M. Henri Nenot, the architect of the Sorbonne, has been promoted to the grade of "Commandeur" in the Legion of Honour. The cross of "Chevalier" has been bestowed on M. Louis Rousseau, architect, of Louis-le-Saunier.—M. Daveley, architect, has been commissioned by the Municipality of Algiers to prepare plans for a large Salle des Fêtes which is to be built in that city, at an estimated cost of a million francs.—It is proposed to entrust to M. Olivier Merson the decoration of the Salle des Caritatives at the Hôtel de Ville. It was to have been decorated by Cabanel, at whose death it was given to Emile Lévy, who also died without having commenced the work. Since then M. Deperthes and M. Formigé have been successively commissioned to study a decorative scheme for this apartment, where the Caritatives, the work of Cugnot, will probably be replaced by figures of a more decorative character.—The artistic club in the Rue Boissy d'Anglas, known under the double name of the "Union Artistique" or "L'Épave," always opens at this time of year. The present exhibition has a considerable number of portraits, of which the most striking is that of Cardinal Mathieu by Benjamin Constant, a splendid work. Among the other exhibits are portraits by MM. Humbert, Roybet, Bonnat, &c., as well as interesting works of other classes of subject, by MM. Gervey, Chartran, Bouchon, and René Billotte.

GERMANY.—Excavations in the cathedral at Speyer have now been completed, and a mixed commission appointed by the Bavarian Ministry has met to deliberate on the question as to what is to be done with the human remains discovered. It is noteworthy that the commission consists of leading

artists, architects, and scientific men. Specialists have declared that the remains are those of Conrad II. (who died about 800 years since) and of other Royal personages, and the principal point the commission has to decide is whether these remains shall be replaced, or whether a mausoleum should be erected for their reception. The matter is still under discussion.

INDIA.—The commerce of Calcutta has increased so enormously during the past few years, that considerable difficulty is experienced in dealing with most of it by the several railways, which approach the city but not enter it. *Indian Engineering* states that the problem admits of but one solution, namely, the establishment of unbroken railway communication, by the shortest practicable route, between the eastern and western termini, Calcutta, and the docks, with a central passenger station in the business heart of the city. The matter is engaging the attention of the authorities.—New buildings for the Rangoon College are expected to be completed within the present year; the high, middle, and primary departments will then be separated from the college.—It is estimated that the new military secretariat buildings now under construction in Calcutta will cost eight lakhs of rupees.—The Government of India has sanctioned the erection of a fort at Dargal, the terminus of the Nowshera-Dargal railway.—With the view of mitigating the effect of drought and famine, it is announced that the Viceroy is considering several plans of storing water. It is generally believed by Indian engineers that the proposed great works would be highly beneficial, and reference is made to the successful establishment of the water supply of the city of Nagpur in 1860 by Sir A. R. Binnie.—It is announced that the Lahore railway station has been completed; the cost of the additions and alterations to the Lahore yard is estimated at 78,515 rupees.—The city of Taunggyi, the headquarters station of the superintendent of the Southern Shan States, has been much improved. The drainage has been completed, and amongst its recently constructed public buildings is a school for the relations of the various Shan chiefs and a commodious brick-built bazaar. The houses generally are also of a more permanent character than any which previously existed.—The Government of India has, practically, decided to establish a first-class arsenal at Kirkee.

AUSTRALASIA.—Victorian architects are highly incensed at certain observations recently made by the judge and an engineer during some evidence given in connexion with the Inquiry Board in Melbourne. The gist of the observations was that 90 per cent. of the architects were not worthy of being called professional men. The Council of the Royal Victorian Institute of Architects have, consequently, called upon the Board to give an explanation. It is pointed out that the Institute's examination of the credentials of candidates for membership is very strict; that the Board's stigma cannot possibly refer to them. The remedy suggested is an Act for the registration of architects.—The new municipal buildings at Toowoomba, Queensland, are completed, and were duly opened towards the end of December last.—Plans for a School of Arts building, to be erected at Exeter, New South Wales, are being prepared by Messrs. Slatyer & Cosb, architects, Sydney.—A Roman Catholic church has recently been opened at North Richmond, Victoria; the architect is Mr. G. W. Vanheems, of Melbourne.

MISCELLANEOUS.

APPOINTMENT.—The Secretary of State for India has appointed Mr. William Henry James, B.Sc., Assoc.M.Inst.C.E., professor of civil engineering in the Madras College of Engineering. Mr. James is the present assistant lecturer and demonstrator in engineering at University College, Cardiff.

ELECTRIC LIGHT, MOTHERWELL, EDINBURGH.—On the 1st inst. the installation of electric light, which has been laid down during the past year, was turned on in the principal streets of Motherwell. The scheme carried out from designs prepared by Professor A. B. W. Kennedy, of London, will cost 30,000*l.*

A SAW-SHARPENING MACHINE.—Messrs. Glover & Co., of Leeds, send a description and illustration of their patent saw-sharpening machine, the advantages of which are thus represented by them:—"The most experienced 'hand-saw sharpener' is obviously only able to file the teeth of the saws quite straight, and certainly the frequent liability is for him to file them round, whereas, by means of the circular revolving emery-wheel in this machine, the teeth are compelled to be slightly hollow, like a skate blade. Thus they are rendered much sharper, and cut better, and remain sharp longer than if sharpened by hand. By very easily adjustable contrivances all the various angles and 'leads' required in the saw teeth may be secured, and by a 'stop motion' (the emery-wheel lowered to a given point for each tooth) the teeth are accurately sharpened to one height; thus each tooth must do an equal amount of work. In this improved machine 'Glover's Special Emery-Wheels' are used, and the temper of the saws is kept intact by a fine spray of cold water ejected exactly on the tooth being operated upon."



The "Kallio" Sink.

THE "KALLIO" SINK.—A new scullery sink in porcelain enamelled fire-clay, and called the "Kallio" sink, is brought under our notice by the Durran's Patents Syndicate. The sink appears to have some advantages. Half of the sink contains water in which vegetables or dishes are washed, the overflow passing over a "weir" into a channel where the bits and refuse are collected as the water runs away. Judging from the drawing, the plan is a good one, but it is sometimes difficult to induce the English servant to adopt new methods; still, we think this sink ought to lighten the labour of the thankless and uninteresting "washing-up" process.

GREEK ARCHITECTURE.—At the rooms of the Society for the Encouragement of the Fine Arts, 9, Conduit-street, on the 31st ult., Mr. R. Phené Spiers, F.S.A., delivered a lecture on "Greek Architecture." Dr. Phené, who presided, said the point had arisen whether or not they should postpone the lecture because of the national distress which had overwhelmed them. But he himself had advised that there should be no postponement. Amongst the many things that our late Sovereign took in hand, and mastered, was that of the ornament of architecture, especially as exhibited in the Albert Memorial and in the Mausoleum at Frogmore.—Mr. Spiers then proceeded with his lecture, which was, in the main, a description of an extremely interesting series of lantern views of the leading features of the architecture of Greece, together with some presenting specimens of Greek architecture discovered in the South of Italy. In referring to the Temple of Hera, at Olympia, Mr. Spiers discussed the question as to how it was that the famous statue of Hermes, by Praxiteles, remained undiscovered until about twenty years ago, when it was found buried in the clay of which the temple was built. He inclined to the belief that the walls of the temple, constructed of crude or unburned bricks, lost their roof or protective covering about the fourth century, and so crumbled away, with the result that the statue fell and was buried underneath the débris of the walls, thus escaping the notice of the Romans, who generally took everything, and that of the Christians, who generally destroyed everything.—*Standard.*

NEW CLOCK, BEVERLEY MINSTER.—A very large clock and chimes are being made for the Minster Towers. The clock and chimes will be in the north tower and the hour striking will be done in the south tower upon a bell between five and six tons weight. The work is being carried out by Messrs. Smith & Sons, of Derby, to the designs of Lord Grimthorpe.

COLLAPSE OF A BRIDGE.—On the 31st ult., Buckle Burn-bridge, N.B., which was christened by the Buckle Town Council a few days previously the "Queen Victoria Bridge" collapsed. All night, and, indeed, steadily for a week past, a fierce gale played upon the structure, which was just on the point of leaving the hands of the contractors, Messrs. Stuart & Sons, of Peterhead. The two central piers, built of masonry, hearted with concrete 6 ft. 6 in. broad at the base, tapering to 4 ft. 6 in., collapsed under the strain, there being, it is computed, fully 4,000 tons of superstructure resting on them. The three arches, two of 25 ft. and one of 34 ft., went bodily into the valley 40 ft. below, snapping off like a pipistem at the granite pilasters, and leaving a yawning gulf a hundred feet wide. The débris, consisting of bricks, scaffolding, granite blocks, concrete stones, and sand, completely choked up the valley and dammed back the Burn, which is in flood, forming a lake 20 ft. deep and extending far up the valley. The contractors began the bridge on August 4 last, and, favoured by the weather, were enabled to make rapid progress. A month ago the Town Council decided to add 3 ft. of extra height to the superstructure, after being approved by the consulting engineer, Mr. Barnett, C.E. of Aberdeen. This had just been done when the disaster happened. The roadway was 45 ft. wide. Each of the smaller arches was circled with three rings of brick, a coating of 6 in. of cement being laid over all, the central span having four rings. Peterhead granite figured largely in the erection.—*Morning Advertiser.*

STREET IMPROVEMENTS, YORK.—The Corporation of York having petitioned the Local Government Board for powers for compulsory purchase in regard to certain properties in Coppegate, Nessgate, and Spurriergate, which they propose to take for the purpose of effecting street improvements, Mr. R. H. Bicknell, M.Inst.C.E., one of the Inspectors of the Local Government Board, held an inquiry in the Guildhall on the 1st inst. The

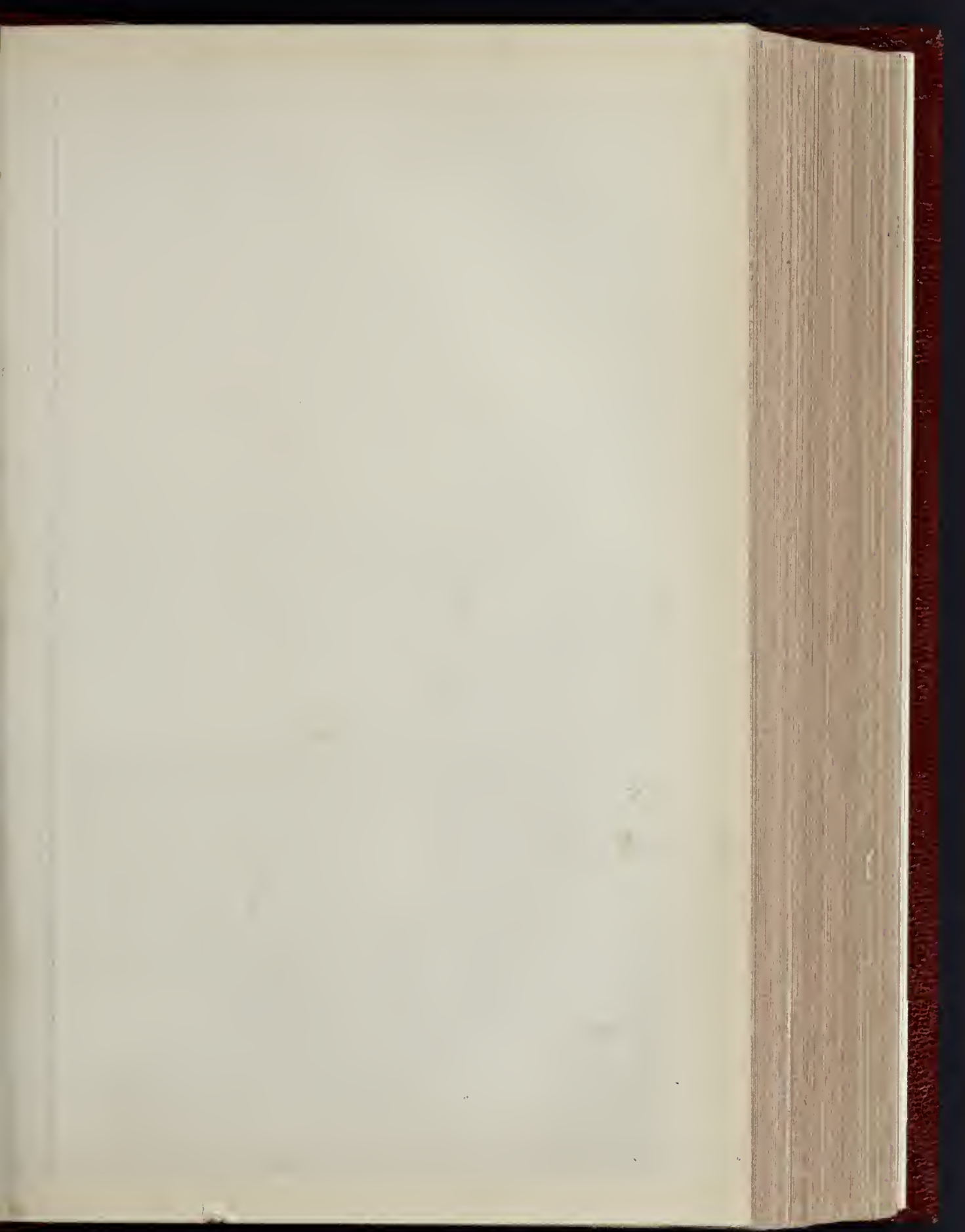
Corporation were represented by the Town Clerk (Mr. W. H. Andrew), the City Surveyor (Mr. A. Greer), and the City Accountant (Mr. Davison). The Town Clerk read the petition, which dealt in detail with the proposed improvements. It was proposed to widen Coppegate, Nessgate, and Spurriergate. After discussion, the inquiry closed.

COCKSPUR-STREET.—The London County Council have recently purchased for, we understand, 100,000*l.*, the freehold interest in Nos. 26-7, Cockspur-street, Charing-cross, for the purpose of providing additional accommodation for their staff. At their meeting on November 6 last the Council also agreed, with that same object, to a recommendation made by their Establishment Committee to acquire for 16,250*l.* the interest of the superior lessee in the adjoining premises, No. 25, Nos. 26-7, Cockspur-street were erected for Mr. E. Stanford (who removed thither from No. 55, Charing-cross) in 1888-9, by Messrs. Higgs & Hill, contractors, after the designs of Mr. T. Barnes-Williams. They stand on the site of the "British Coffee House," designed in or about 1770 by Robert Adam, and, as we observed at the time, it is to be regretted that so good an example of the school of the brothers Adam was destroyed. Mr. E. Stanford has opened a new chief establishment in Long Acre, but the sale of the 1-in. and 6-in. Ordnance maps of England and Wales and other maps, together with that of cognate works and publications, will be continued in the front shop of the existing premises in Cockspur-street.

MODERN OPERA HOUSES AND THEATRES.—Mr. B. T. Batsford announces a second issue of Mr. Edwin O. Sachs' monumental work, "Modern Opera Houses and Theatres," which will be published in the spring. The new issue will contain a special preface, not dealing with the latest developments and improvements in theatre architecture, not only at home, but in foreign countries.

PRIZES FOR DESIGNS FOR FURNITURE.—The Council of the Society of Arts hold a sum of 400*l.*, the balance of the subscriptions to the Owen Jones Memorial Fund, presented to them by the Memorial Committee, on condition of their spending the interest thereof in prizes to "Students of the Schools of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers, and hangings, damasks, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes will be awarded on the results of the annual competition of the Board of Education, South Kensington. Competing designs must be marked "In competition for the Owen Jones Prizes." No candidate who has gained one of the above prizes can again take part in the competition. The next award will be made in 1901, when six prizes are offered for competition, each prize to consist of a bound copy of Owen Jones' "Principles of Design," and the Society's bronze medal. Further particulars may be obtained from the Secretary of the Society of Arts, Sir Henry Trueman Wood, M.A., John-street, Adelphi, W.C.

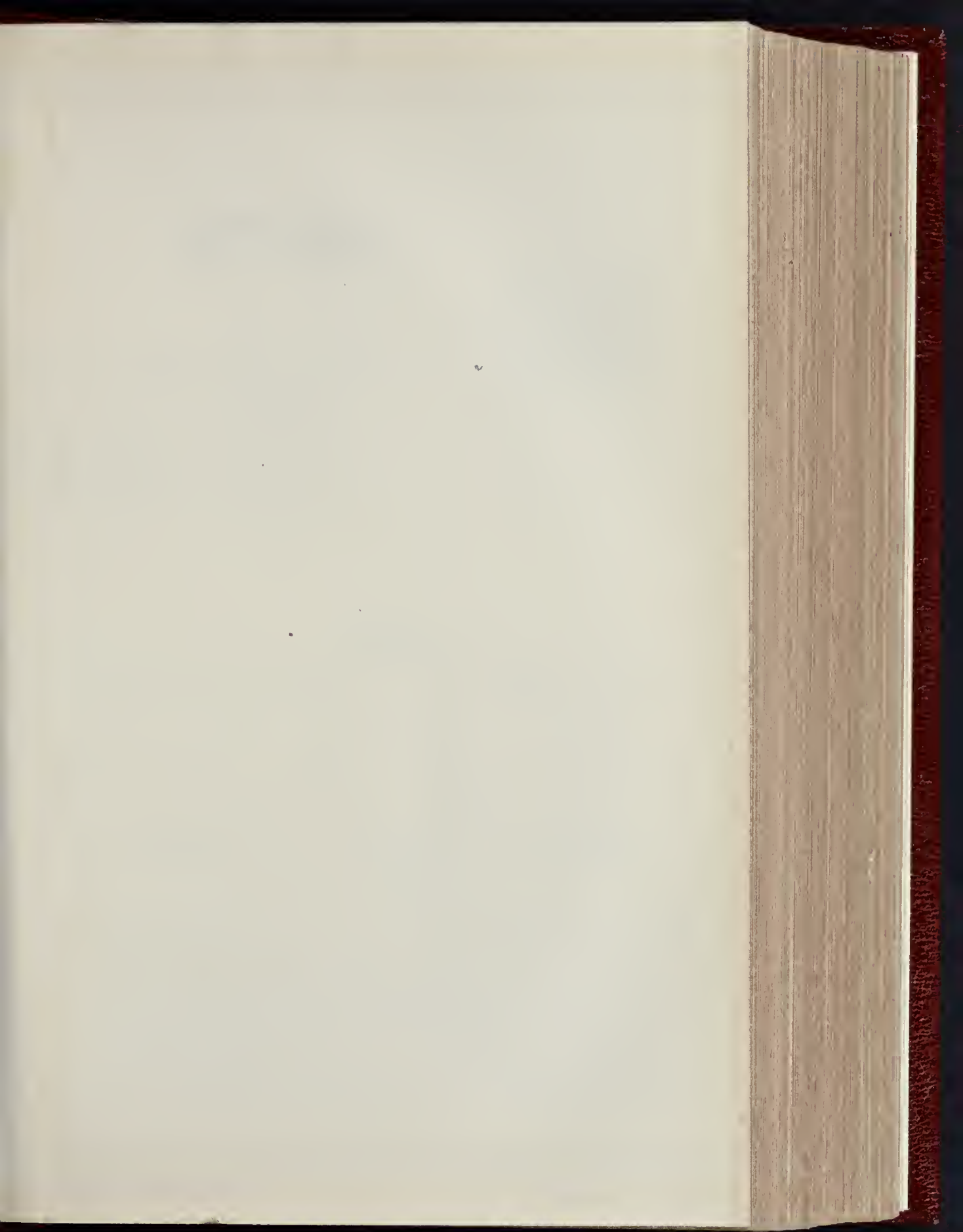
REFRIGERATION AND COLD STORAGE.—At the City of London College on Wednesday, the 30th ult., Mr. Hal Williams read a paper on "Refrigeration and Cold Storage" before the City of London College Science Society. As the paper was combined with a visit to the cold stores of the Colonial Consignment and Distributing Company, Limited, Nelson's Wharf, Commercial-road, S.E., where modern refrigerating plant was seen at work, the author confined himself to a popular explanation of the principles of refrigeration and the refrigerating machine. Refrigeration means the reduction of a body to a temperature below its normal. The only way this can be done is by bringing the substance to be cooled into contact with a substance already colder than itself. The heat absorbed by the refrigerating substance is, as it were, pumped by the machine to a higher level of temperature, and there discharged into some substance, such as water, which will, while in its natural condition, receive heat from it. Heat cannot be raised from one level of temperature to another without the expenditure of energy in some form or other, so that the heat given up to the cooling water consists of the heat absorbed from the substance to be cooled, plus the heat representing the work done in raising it to a higher level of temperature. A refrigerating machine is the exact opposite of a heat engine, for in the latter the higher the high temperature and the lower the low temperature, the more efficient the engine, while with the former the lower the high temperature and the higher the low temperature, the more



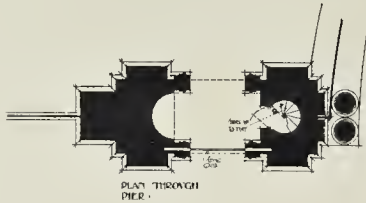




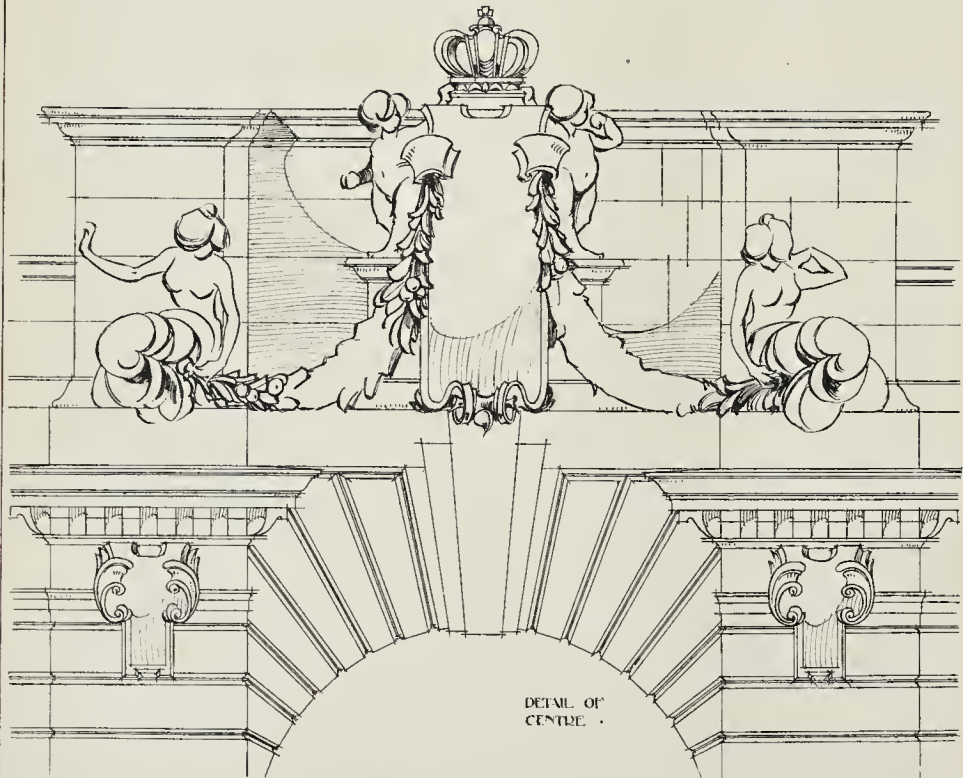
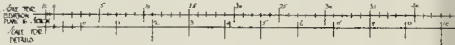
ST. PETER'S AND BERNINI'S COLONNADES.



TITE PRIZE
DESIGN FOR AN
ENTRANCE GATE-
WAY TO A
PUBLIC PARK



ELEVATION TO ROAD



DETAIL OF CENTRE

R.I.B.A. Title Prize, 1901:
Second Prize of Ten Guineas.

DESIGN FOR AN ENTRANCE GATEWAY

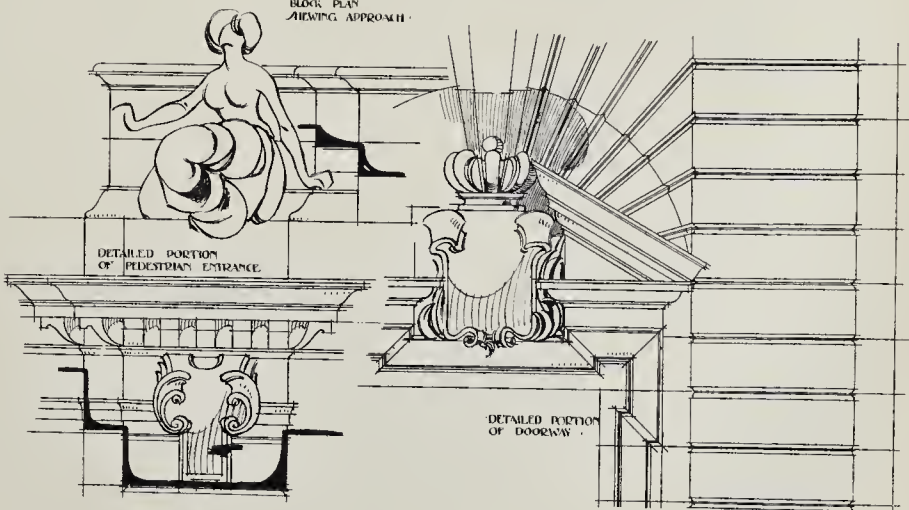
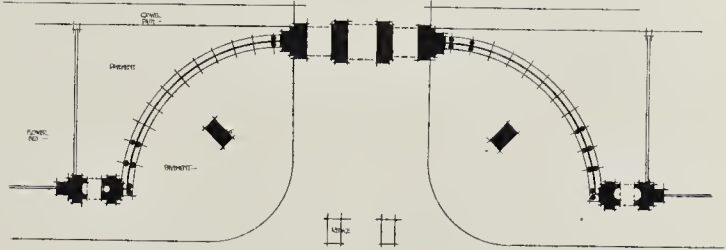
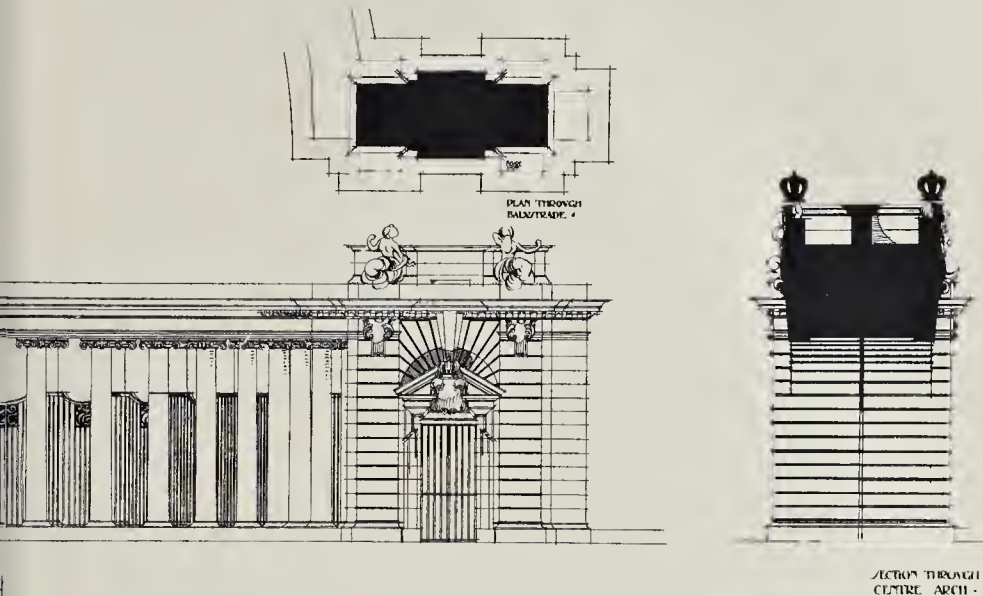
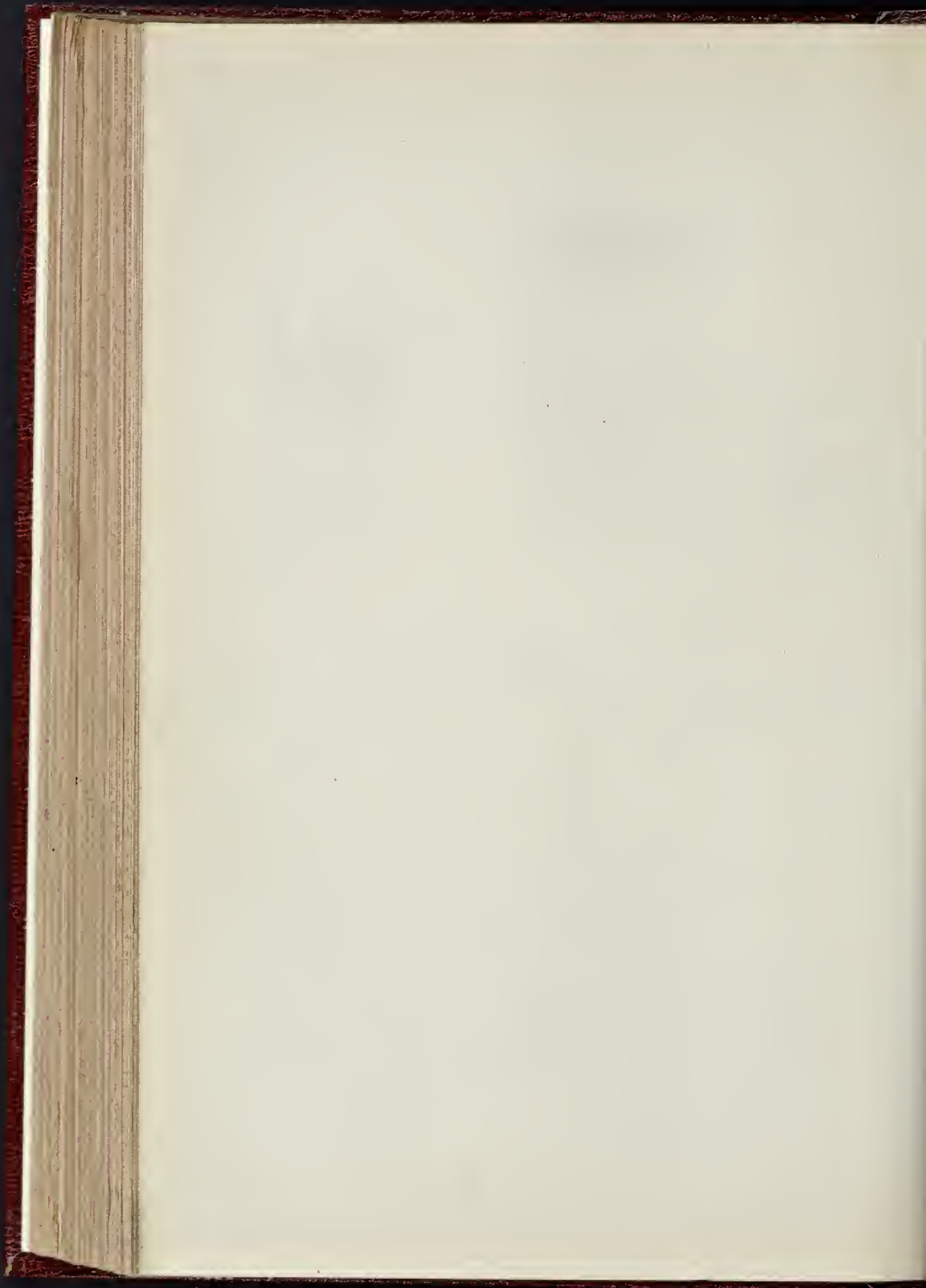


PHOTO-LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



efficient machine. The author went on to give a description of the cold-air machine and explained its principles. He then pointed out the qualities of the chief refrigerating agents and explained the characteristics which made their use as a refrigerating medium possible; and this he described in the absorption machine and the vapour-compression machine, and—quoting Professor Ewing—said that the absorption machine was from two and a half to three times as efficient as the cold-air machine, and the vapour-compression machine from five to six times as efficient as the cold-air machine, and from two and a half to three times as efficient as the absorption machine. Some remarks were made on the much mooted question of the critical temperature of CO₂, and of the behaviour of that gas under high temperatures; and the paper concluded with a description of the three chief methods of cooling cold stores—viz., by direct expansion of the refrigerating agent in pipes traversing the cold stores; by the circulating in pipes of brine previously cooled by the refrigerating agent; and by the air blast system, in which air is brought into contact with cold brine, is reduced in temperature, and is then circulated through the stores.

STONEHENGE.—The Society of Antiquaries, it is stated, has offered to co-operate with the owner of Stonehenge for its protection.

A NEW PARK FOR TOTTENHAM.—At the next meeting of the Tottenham District Council, it is stated, a contract will be signed for the purchase of a new public recreation ground. The site selected is a part of the estate known as "Downhills," and consists of a mansion, its grounds, and three large fields. The whole comprises nearly thirty acres, and although a good deal of neighbouring land has been sold for 1,000l. an acre, the price to be paid for the new park is but 800l. an acre.

WIDENING OF HAMPESTEAD-ROAD.—A meeting is to be held on Monday, at the Tolmers-square Institute, Drummond-street, at 8 p.m. to advocate the widening of Hampstead-road at its junction with Euston-road. Dr. Collins, of the London County Council, will take the chair. The improvement advocated is one which we consider is really called for.

BUILDING LAND AT WIMBLEDON.—In our advertisement columns will be found the announcement of an approaching sale of a considerable portion of the Wimbledon House Estate. The land included in the present sale is divided into about thirty-five lots of various sizes and positions, suitable for houses of various classes. It is to be hoped that the present sale will be the opportunity to establish a residential district well laid out and occupied by self-built and architectural houses.

CAPITAL AND LABOUR.

THE CARPENTERS' AND JOINERS' DISPUTE.—The annual meeting of the Builders' Association was held at 32, Ann-street, Belfast, on the 29th ult., the proceedings being conducted in private. Mr. J. A. McAuley, secretary, informed, in a business representative, however, that the employers were unanimous in declining to accede to the demands of the men for an increased wage, and are at present well supplied with non-union workmen. A circular has been drafted, and will reach the Carpenters' and Joiners' Union in a few days, giving notice of a material reduction in the rate of pay. In the face of the builders' decision the possibility of a settlement of the dispute, which has now been on for about nine months, appears very remote. A deputation was appointed by the Union to meet the Association and discuss the situation in the presence of Sir James Haslett, M.P., but matters have been left in abeyance owing to the death of the latter. The men refuse, after being out nine months, to resume their work at the same rate of wages and hours as previously, but it is stated that they would be willing to accept 3d. per hour advance in wages, or a promise of such advance, with the other concessions already promised by the Builders' Association. Failing that, they have the option of their governing body to remain on the job till an increase of wages is offered, as well as hearty support of the other trade societies in the district and throughout Ireland, England, and Scotland, who have from the beginning assisted financially on a liberal scale. A principal point of difficulty appears to be that the refusal of the builders to discuss Rule 1, which has reference to wages and hours. The men assert that they are willing to meet the masters in every possible way, and propose that the wages part of the dispute should be discussed and the hours omitted, or *versus*, as a reasonable compromise.—*Irish News.*

HEFFIELD PLUMBING TRADE DISPUTE.—This is the fifth week of the plumbers' strike in Sheffield, and as there are no prospects of a settlement, the employers have for the first time made a statement of their position. On June 30 last the operative plumbers gave six months' notice for an advance in wages of 4d. per hour, in order to bring themselves to the level of some of the building trades. On July 13 the employers, on their part, gave notice for the alteration of rules, in order to bring plumbers to the same conditions of working as other trades of the building trades, and also for a reduction of 4d. per hour in wages. When the rules of the trade were settled some years ago it was

agreed, in order to prevent strikes, that in case of any dispute or any request for an alteration of rules, a court of arbitration should be formed, consisting of six employers and six operatives, the decision of this court of arbitration to be final and binding on both sides. In case of disagreement, an umpire was provided for, and his award should be accepted by both sides. Acting on this rule, the masters asked the operatives to appoint six of their members, and a court was formed. Several conferences were held, but as there was no prospect of an agreement being arrived at, the employers asked for an umpire to be appointed. The operatives declined to agree to this course, stating that unless the demands they had made were agreed to they would strike. In the face of this the masters were unable to proceed further, and a strike commenced at the beginning of the present year. The employers resist the claim of the operatives for the following reasons: 1. Taking into consideration wages and conditions of labour, the Sheffield plumber is as well off, if not better off, than plumbers in any other part of the kingdom, and certainly better off than men engaged in other branches of the building trades in Sheffield. 2. In face of declining trade, and the general state of the labour market, the employers consider it would be unreasonable, not only in their own interests but also in the interest of the public, to give an advance of wages at this time. 3. When the last advance of wages was arranged by the Board of Arbitration, the employers' representatives gave way on the understanding that the operatives would give way on the question of rules as to men going direct to their work instead of to the shop. The operatives were very much dissatisfied with the carrying out of this agreement. Leeds and other towns are only paying their men 84d. per hour, and the workmen there have worse conditions than in Sheffield. Notwithstanding the great inconvenience that has been caused to the public by the strike, the employers have done their best to meet the most urgent demands made upon them, and they have succeeded in securing a goodly number of workmen from other towns to help them out of their difficulty. Of course, some of these "strangers" have returned home again, and it is alleged by the employers that this is the result of the action of the operatives' union. "It is a disgrace to the twentieth century," says one official, "that a man who is able and willing to work to provide for his wife and family should not be allowed to do so, and should have to submit to coercion and intimidation from those who decline to work."—*Sheffield Daily Telegraph.*

DUNDEE JOINERS' WAGES.—A meeting of Dundee Master Joiners' Association was held on the 1st inst. in the office of Mr. Joseph Wilkie, solicitor, the secretary, when the standing by-laws between employers and men were under consideration. Certain modifications were discussed, and ultimately the matter was remitted to the Conciliation Board. The decision of the men at their meeting the previous evening to resist any attempt on the part of the employers to reduce their wages was likewise discussed. The general feeling was that as the spring and summer months advanced a slight reduction in the rate of wages would be necessary, and that the men would be well advised to agree thereto. It was pointed out that in the meantime the rate was the same as that paid in Edinburgh, whereas Dundee was always formerly regarded as paying 4d. per hour less than the rate paid in the capital. No definite decision was come to, and this matter was also remitted to the Conciliation Board.

LEGAL.

SPECIFIC PERFORMANCE OF A BUILDING COVENANT.—IMPORTANT CASE.

THE case of the Mayor, &c., of Wolverhampton v. Emmens came before the Court of Appeal on the 1st inst., on the application of the defendant for judgment or a new trial on appeal from verdict and judgment at trial before Mr. Justice Wills and a special jury at the Birmingham Assizes. The action was brought for specific performance of a covenant to build, or in the alternative for damages for breach of that covenant.

It appeared that the plaintiffs, the Corporation of Wolverhampton, conveyed to the defendant, a solicitor, a piece of land in the borough of Wolverhampton, and in that conveyance the defendant covenanted with the plaintiffs that he would commence to erect upon the land within twelve calendar months from May 25, 1897, a new building or buildings of a minimum height of 35 ft. from the pavement to the eaves or parapet, and not more than the height regulated by the by-laws in force in the borough, and would complete the same ready for occupation within two years. The defendant proposed to build on the land eight houses, and submitted plans of the proposed buildings to the plaintiffs, and they were accepted. The defendant afterwards came to the conclusion that, in view of the overbuilt condition of the neighbourhood, it would be impossible for him to make any profit on his building scheme, and he failed to erect any buildings in accordance with his covenant. The plaintiffs then brought the present action against the defendant. The defendant pleaded that it was not a case in which the

Court would order specific performance, and paid 40s. into court, as being sufficient to satisfy the plaintiffs' claim for damages. Mr. Justice Wills, at the trial, held that the plaintiffs were entitled to a decree for specific performance, but in case the Court of Appeal should consider he was wrong on that point, he left it to the jury to say what damages they considered the plaintiffs were entitled to for the breach of the covenant, and they assessed the damages at 50l.

Mr. Jelf, K.C., and Mr. Disturnal appeared for the appellant, and Mr. A. T. Lawrence, K.C., and Mr. R. J. Lawrence for the respondents.

Mr. Jelf contended that it was not a case in which specific performance should have been ordered, as it was not the practice of the Court, except in very exceptional cases, to grant specific performance of a covenant to build. The covenant in question was exceedingly vague, being simply to erect a new building or buildings. Nothing was said as to the number, style, or as to the material to be used. It was not, he submitted, a contract which ought to be specifically enforced. The defendant was willing to pay the 50l. damages and the costs of the action and to give back to the Corporation the site he had purchased from them if they would hand him back the 1,000l. he had paid for it.

Mr. A. T. Lawrence, for the respondents, argued that it was a proper case for specific performance. If the covenant was indefinite, the contract between the parties had been made definite by the submission and acceptance of plans.

In the result their Lordships unanimously came to the conclusion that it was a case in which specific performance was the proper remedy, and that the judgment of Mr. Justice Wills was quite right.

The application accordingly was dismissed. Upon the application of Mr. Jelf, and the plaintiffs not objecting, the appellant was given until this time next year in which to carry out his contract.

THE BLUE LIAS LIME PROSECUTION.

THE hearing of the summons issued at the instance of Alfred Andrews, of the Blue Lias Lime-Burners' Association, Medway Wharf, Grosvenor-road, against the Cam Portland Cement Company, Limited, Weldreth, Royston, Cambridge, under the Merchandise Marks Act, was resumed before Mr. Horace Smith at the Westminster Police-court on Wednesday afternoon. The summons charges the defendants with "unlawfully and with intent to defraud applying or causing to be applied to certain goods, namely, four tons of ground hydraulic lime not being Blue Lias Lime, a false trade description as to the place in which the said goods were produced, the mode of producing the same, and the material of which the same were composed, whereby the said goods were falsely described as being Ground Blue Lias Hydraulic Lime, contrary to the provisions of the Merchandise Marks Act, 1887."

At the last hearing it was stated that four tons of lime described on the invoice and on the sacks as "blue lias lime," was obtained from the defendants, and upon examination and analysis it was found that it was not made from the blue and lias rock, a geological formation not known to Cambridgeshire.

Mr. Willis, barrister, again appeared for the prosecution, and Mr. Horace Avory, K.C., defended.

Mr. Bertram Blunt said he was a Fellow of the Chemical Society, a Fellow of the Institute of Chemists, and a member of the Society of Public Analysts, and a member of a firm of analysts having offices at the Broadway, Westminster. He had received a sample of material described as blue lias lime which he had analysed and examined. On being mechanically examined he found it did not present the characteristics of blue lias lime in the way in which it set. Blue lias contained a much greater proportion of actual lime than the material he examined, and correspondingly a smaller quantity of silica and oxide of iron. The specimen he examined contained 57.64 per cent. of lime and 20.98 per cent. of silica, whereas the ordinary amount of these constituents in lime made from blue lias rock were 70.00 per cent. of lime and 12.200 per cent. of silica.

Cross-examined: He was not a geologist, and therefore did not know that the lias formation consisted of five distinct strata which differed entirely from one another. Asked to explain a preponderance of silica in a sample of lime admitted to have been made from the blue lias rock, he stated that it was the result of the workmen not picking out the shale cleanly enough before sending the rock to be burned.

Mr. Avory: Do you say that blue lias lime means something into which no shale or extraneous matter has been introduced?—Yes.

And you do not care what builders and engineers say?—I don't care what builders say, but the opinion of engineers is most valuable.

Do you know that blue lias lime that comes from the district of the blue lias formation does, in fact, contain extraneous matter?—I do not know it.

Mr. George Frederick Deacon, a civil engineer of Westminster and a member of the Council of the Institution of Civil Engineers, said he had used blue lias lime very largely in the construction of reservoirs. Blue lias

me had a definite signification, and was well known to engineers and builders long before any other limes generally known by name, and before Portland cement was known at all. Blue lias lime meant hydraulic lime burnt from the blue lias formation—the lower beds of the lias formation. "Blue lias" as applied to lime was not used as a mere synonym for hydraulic.

Cross-examined: The lias formation included an immense number of hands of rock, none of which were precisely the same. They differed a little in proportion of the materials, but the general proportion of lime was 50 or 60 per cent. It varied from a strong hydraulic lime to a weak hydraulic lime. Mr. Avory: Is the fact that lime has come from the blue lias formation a guarantee of the hydraulic character of the lime? It is a guarantee of the behaviour of the lime—that is, in its slowly-setting qualities. All lime that comes from the lias formation sets slowly.

In reply to the magistrate, witness stated that he had seen an analysis of a hydraulic lime which set slowly, and it was exactly the same as artificial Portland cement.

Sir Douglas Fox, civil and mechanical engineer, and formerly President of the Institution of Civil Engineers, said the term "blue lias lime" was a definite one to engineers. He could not speak for the builders. He would not accept lime from Cambridgeshire when he had specified blue lias.

Cross-examined: The blue lias lime he had used had been of constant quality and always strongly hydraulic. Bad blue lias could be made, but he always approved of the makers when buying.

Mr. Wm. Gregory, surveyor and estimator to Messrs. Bywaters & Sons, builders, King-street, Regent-street, said the term "blue lias" was well known in the building trade, and had a uniform significance. It was lime burnt from the lower beds of the blue lias rock formation. The term was not properly applied when applied to lime made from chalk or marl.

Mr. Frederick Thos. Mullitt, a surveyor, of London and Cambridgeshire, said that there was no blue lias rock in Cambridgeshire. The blue lias formation was run out long before it reached Cambridgeshire. A hydraulic lime was made in Cambridgeshire, but it ought not to be called lime—it was only a sort of poor cement. He would not accept blue lias lime except it came from Warwickshire, Leicestershire, or Nottinghamshire.

Cross-examined: Blue lias lime was made in other places than had been mentioned. For the building trade, blue lias lime, if specified without any qualification or special name, implied blue lias lime from one or other of the three counties he had mentioned. Until that case he had never heard of lime that was lime being made in Cambridgeshire. It was not within his knowledge that blue lias lime had been made and sold in Cambridgeshire for the past ten or fifteen years.

Mr. Alfred William Redding, a member of the firm of Redding & Son, builders, Reading, said he was acquainted with the lime manufactured from materials found in Cambridgeshire. He had never heard the term "blue lias" applied to any lime made there, nor that it was made there from imported blue lias rock.

Cross-examined: He would not go to any place but Leicestershire or Warwickshire for blue lias lime.

Mr. Alfred Wm. Swan, a lime burner, of Cambridge, said he had never heard of blue lias lime being made in Cambridgeshire.

Mr. Avory: They have brought you all the way from Cambridge to say that?

Witness: I suppose so.
This concluded the evidence in support of the complainant's case, and the summons was again adjourned.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,056.—BALL AND FLOAT VALVES: *J. Levick*.—The novelty of the invention consists in the adoption of wrought metal instead of cast metal for the studs that join the float-arms and the floats; a stud which is made out of a metal blank is so fashioned that whilst one side of it will screw on to the float-arm the other side will fit on to the float.
20,058.—ATTACHMENTS OF DOOR-KNOBS, &c.: *E. V. Bally*.—Transverse holes are made in the spindle, a portion of whose length is split. After the pin has been screwed into its place the end of the spindle can be expanded within the neck of the knob. In another form it is arranged that the point of the screw shall enter into the opposite side of the neck of the knob, the point of the pin, instead of its head, being threaded accordingly. The contrivance is available for attaching cupboard turns and similar fastenings to their spindles.

20,061.—JOINTS FOR PIPES, DOORS, &c.: *D. A. Blair, F. B. Blair, & R. Baillie*.—The inventors' object is to provide means of jointing or bolting together the metal flanges or faces around pipes, doors, &c., so that fluid-pressure joints can be easily made or disconnected by the employment of T or other headed bolts and nuts, the nuts and bolts being strung together and pivotted upon a continuous wire or rod. In one modification the bolts are inserted sideways into the bolt-holes that are

open at the side outwards, and the rod or wire upon which they are pivotted is coupled or joined with a sliding link or with screw-threaded ends and nuts; the hinge joint is to be broken by turning the bolts downwards after the nuts have been loosened.

20,068.—RESISTANCE METERS (ELECTRICAL): *C. Bessie*.—With a source of constant current, a rheostat, and a resistance that may be either a 1,000-ohm standard or the higher resistance which is to be measured, is connected in series a graduated galvanometer which will measure a few milliamperes, by means of a suitable adjustment of the rheostat the galvanometer will be caused to give its maximum reading with the standard resistance in circuit; then is substituted the resistance which it is required to measure and the diminished deflection of the galvanometer will thereupon show, by means of its graduation marks, the amount of the resistance in question.

20,100.—A SUPPORT FOR ELECTRICAL LAMPS: *M. Raiting and F. H. Collings*.—The two halves of a ball fitting are screwed together, and connected electrically with spring plungers, which are mounted within recesses in an insulator bearing in halves upon a circular and a central block. If more than two connections are needed, the circular block should be divided into segments, and corresponding spring plungers should be supplied. An S-shaped lug projects between the plungers from the insulator, and the supply and lamp wires are secured with screws in the circular and central blocks and the carriers of the plungers.

20,124.—ELECTRICAL APPARATUS FOR GAS LIGHTS: *Soc. Anon. "L'As Nova"*.—The gas is lighted and extinguished with an apparatus that comprises separate electro-magnets and circuits. The valve and the sparking contrivance are worked at one and the same time; the spark ignites the main burner, and not an auxiliary burner or pilot jet. With the flow of the current through the electro-magnet of the lighting circuit an armature operates a lever so as to open the gas cock, whilst an insulated disc raises a rod which serves to break circuit at the sparking points; another armature turns the lever in the reversed direction so as to cut off the gas supply, after the current has been caused to pass through the other electro-magnet. An adjustable spring, that bears against the large end of the cock, obviates leakage of gas from the plug cock.

20,132.—AN APPLIANCE FOR SLOTTING HOLES IN DOORS, &c.: *F. Flocks*.—An appliance, to be driven by the hand, for slotting holes in doors and for kindred purposes, consists of a frame which is clamped on to the door, a worm upon the slotting auger gears with two worm-wheels, the wheels being carried by screws which communicate a side feed-motion to the auger.

20,139.—ARTIFICIAL STONE, TILES, BRICKS, &c.: *A. Catosinski & L. Weintraub*.—The material is composed of an admixture of hydraulic cement and coal waste or slack, and water—the ratio of the cement to the waste being as one to two—and is then ready for being moulded into the shapes desired.

20,166.—FLOORING CONTRIVANCES: *F. R. Gibbard*.—For joining wooden blocks and so on, together, and in order to prevent portions of the floor from rising or becoming otherwise displaced the inventor devises some sharp diamond-shaped or double-pointed metal fasteners which are to be driven into the sides and the ends of the blocks or pieces, or the blocks may be slotted to take the fasteners; the fastener should be made with one of its points longer than the other point. In laying the flooring the blunted points of the fasteners are first driven into the blocks.

20,221.—PAINTS AND PIGMENTS: *T. F. O'Sullivan*.—For the making of pigment, a mass of sawdust is saturated with a solution of some iron salt, the compound is then dried and burned. The strength of the iron solution will determine the colour of the resultant pigment.

20,263.—RACK PULLEYS FOR BLINDS: *E. Wareham*.—To the lower portion of the window frame is fixed a cup. Within a slot in the cup is pivoted an arm, at the end of which is a pulley, around which the endless cord of the blind is passed; tension upon the cord is obtained by means of spiral springs that bear against the arm lever and against lugs fixed upon the cup. The invention includes modified applications of the principle involved, and in one shape a spring-arm is substituted for the spiral springs.

20,271 and 20,275.—THE MOULDING OF SINKS, SAGGERS, &c.: *B. Robinson*.—In an extrusion machine used in the making of sinks and similar dish vessels a movable slide, which is fitted upon the mouthpiece, is to be pressed downwards on to the clay or other plastic substance by means of a screw which is turned with a hand-wheel and bevel gearing, the slide being lifted when enough of the material for making the trough of the sink has been pressed out. A wire then cuts off the sink closely against the mouth-piece; a distributing centre is formed upon the mouth-piece, and rollers, or latbs affixed to endless hands, serve to support the sink; the side-plates of the die are allowed to open out (being afterwards driven together) so as to prevent the back of the sink from bulging inwards just before it is cut off. For shaping the front of the sink a sliding rod, worked with a weight and cord, presses a facing-plate against the mouth-piece, a cranked shaft serving to retain the rod in

its position; the front of the sink is supported with plates, which also gauge and regulate its thickness (20,275). In the case of Saggings &c.: The extrusion or pipe-making machine is provided with an adjustable centre and a die-plate with a cutting-rim which trims the edges of the slabs. A lever lifts the table until the plate and the rim come into contact; the clay is pressed through the die that it may unite with a hat or slab of clay which has been laid upon a loose plate on the mill, whereupon the table is freed and is pressed downwards by the body of the sagger as it is being forced out; adjustable pipes and an aperture in the core admit air to the inside of the sagger. A slotted die-plate may replace the core and die-plate.

20,316.—CONDUITS FOR ELECTRICAL CONDUCTORS: *W. Sykes*.—The conduits consist of open troughs, made of stoneware, and in single and multiple shapes. The conductors are to be set in bitumen as high up as a rabbet which is fashioned inside the upper parts of the conduits, and will take a cover of cement and sand or bricks after the conductors have been set. The several lengths are fitted together with their spigot and socket joints and a filling of bitumen, and two adjoining lengths are retained in alignment by means of a shoulder or stud that is formed, partly around the socket of one of them.

20,347.—A COMPOSITE MATERIAL: *H. A. Fryor*.—A composite material for use as an artificial stone or marble is made by mixing silica of soda with milk of lime, and gradually adding Faturan or some similar cement to the liquid mixture; then are added mineral colours or other pigments, after which the whole mass is stirred about so as to give it a variegated or veined appearance. The moulded articles, after they have become dry and hard, are taken out of the moulds and rubbed with soft cloths steeped in linseed oil. By another method an admixture of milk of lime, of soda, glycerine, soft soap, and ground marble or small rock, together with hydraulic cement, gypsum, or some such substance ordinarily employed in the manufacture of artificial stone, is moulded, stirred, and strained through a sieve. The compound can be cast when it is in a liquid state or be moulded when in a plastic condition.

20,351.—ELEVATORS AND HOISTS: *A. C. H. Tiedemann*.—A tubular casing which is put together in sections carries the bucket-band. A frame, in which the motor is fixed, joins the pivots upon which the upper and driving sprocket-wheel rotates. On the motor-shaft is a worm which is set in gear with a worm-wheel upon the shaft and the sprocket-wheel is driven by pinions that are fixed upon the worm-wheel's shaft so as to engage with teeth around the inner side of the sprocket-wheel, the two sides of the bucket-band are drawn together with a guide-wheel.

20,377.—BRICKS: *E. W. Beech*.—By this invention, which is described as being quite independent of those set forth in No. 12,874 and No. 12,875, Nos. 5,352 of 1890, one side of the brick is fashioned with one dove-tailed groove, or it may be more, so as to ensure a holding or keying with the mortar or plaster; and in order that the bricks may not cut the bricklayer's hands the grooves are made with rounded edges.

20,387.—AN ADHESIVE CEMENT: *F. Scher*.—A cement which is described as being particularly useful instead of plaster of Paris in the making of electrical gas lamps, gas whips, and other ceramic glass, porcelain, and in some instances metal objects, is made from a paste composed of water-glass, feldspar, and finely pulverised waste fragments of half-burned porcelain and fully-burned hard porcelain.

20,416.—A GRATING FOR DRAINS: *W. R. Hindmarsh*.—The grating is made in a rounded shape, and the top of the side block upon which it rests has a recess which will take the curved grating so as to constitute a common surface with it.

20,423.—A CONTRIVANCE FOR INCANDESCENT GAS BURNERS: *A. Murinick*.—The inventor seeks to provide compensation for variations in the pressure of the gas supply; he arranges the cone-shaped nozzle so that its solid end shall partially close the opening around it. As the gas flows through vertical channels cut around the nozzle it assumes the form of cylindrical films within the chamber above, whence it rises into the mixing tube that is mounted upon springs so as to minimise shocks or vibrations communicated to the mantle. Side draughts are reduced with a pierced disc; and a split tube, to which a nut fastens the support of the mantle, carries the burner head, which is perforated.

20,428.—VALVE-FITTINGS FOR SYSTEMS OF HEATING: *G. Brook*.—The valve-fittings are contrived for circulation pipes, and radiators, and are intended to provide means of diverting and otherwise regulating the course and flow of the heating-fluid, whereby some of the radiators, &c., can be placed out of action without interference with the circulation. For that purpose, a tapered plug-valve, having a handle for its adjustment, is put at the junction of the inlet, outlet, and radiator branch pipes, or at the junction of those three pipes is regulated with mushroom valves, to which are fitted a screwed spindle and a hand-wheel or lever for their adjustment. In the case of a junction formed by the meeting of four pipes, the circulation is regulated with a suitable plug-cock.

MEETINGS.

FRIDAY, FEBRUARY 8.

Architectural Association.—Mr. D. T. Fyfe on "Architecture in Crete and Turkey." Illustrated by lantern views. 7.30 p.m.
Royal Institution.—Professor G. H. Bryan on "History and Progress of Aerial Locomotion." 9 p.m.
The Institution of Junior Engineers (Westminster Palace Hotel).—Mr. Louis F. Auld on "Electric Power Supply in the Metropolis." 8 p.m.
Institution of Mechanical Engineers.—Adjourned discussion of the preceding paper—"Power-gas and Large Gas-engines for Central Stations," by Mr. Herbert A. Humphrey. 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Marriott on "Meteorology." 8 p.m.
Institution of Civil Engineers (Students' Meetings).—Mr. H. E. Wimperis, B.A., on "Cycle Resistance." 8 p.m.
Glasgow Architectural Craftsmen's Society.—"Wall Coverings," Mr. C. Sinclair on "Limes," Mr. R. W. Horn on "Cements," and Mr. J. Arthur on "Patent Plasters." 8 p.m.
Architectural Association of Ireland (Technical Demonstrations).—Mr. B. A. Phillipson on Electric Lighting (10, Lower Baggot-street, Dublin). 4.30 p.m.

SATURDAY, FEBRUARY 9.

Builders' Firm's Association.—Annual Dinner, King's Hall, Holborn Restaurant.
Dundee Institute of Architecture.—Mr. J. D. Mills on "Warwick and Staffordshire Architecture." 7 p.m.
Edinburgh Architectural Association.—Visit to Royal High School, Canongate Parish Church, and Old Tolbooth.
Monday, February 11.
Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." 4 p.m.
Surveyors' Institution.—Adjourned discussion on Mr. R. E. Middleton's paper on "The Future of the London Water Supply." 8 p.m.
Clerks of Works Association (Carpenters' Hall).—Paper by Mr. H. E. Neale. 8.30.
British Society of Architects.—Mr. C. H. Sanson on "Church Restoration." 8 p.m.

TUESDAY, FEBRUARY 12.

Royal Institution.—Professor J. A. Ewing on "Practical Mechanics (experimentally treated): First Principles and Modern Illustrations." 3 p.m.
Institution of Civil Engineers.—(1) Paper to be further discussed, "The Present Condition and Prospects of the Panama Canal Works," by Mr. J. J. Ford. (2) Time permitting, Mr. W. J. Weightman on "The Nilgiri Mountain Railway." 8 p.m.
Society of Arts (Applied Art Section).—Mr. W. Burton on "Recent Advances in Pottery Decoration." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Sanitary Law." 1. 7 p.m.
Edinburgh Architectural Association.—Evening visit to City Observatory.

WEDNESDAY, FEBRUARY 13.

Sanitary Institute.—Mr. Thomas Blashill on "The state of our Streets." The chair will be taken by Sir Alexander Binnie. 8 p.m.
Institution of Civil Engineers.—Students visit to the engineering Models at the Victoria and Albert Museum, South Kensington. 2.30 p.m.
Institution of Sanitary Engineers (Incorporated).—(1) Examination and Literary Committee at 3 p.m. (2) General Purposes and Finance Committee at 4 p.m. (3) Election Committee at 5.45 p.m. (4) Members' Sessional meeting at 7 p.m.
Sanitary Institute (Demonstrations for Sanitary Inspectors).—Inspection at Lambeth Disinfecting Station, Lambeth-road, Lambeth, London, S.E. 1.
Edinburgh Architectural Society.—Mr. J. A. Arnot on "A Holiday Tour in Belgium and Holland." Illustrated by lantern views.

THURSDAY, FEBRUARY 14.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." 4 p.m.
London Institution.—Professor A. C. Haddon, F.R.S., on "The Decorative Art of Primitive Peoples." Illustrated. 6 p.m.
Society for the Encouragement of the Fine Arts.—Dr. J. Offord on "Some recently-discovered Relics of Ancient Art from Western Asia." Lantern illustrations.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Sanitary Law." II. 1. 7 p.m.
Institution of Electrical Engineers.—Adjourned discussion on Mr. W. M. Mordey's paper on "Capacity in Domestic Current Working." 8 p.m.
British Society of Architects and Surveyors.—Mr. H. Stabton on "Our Cathedral Fronts: A Comparative Criticism." 7 p.m.

FRIDAY, FEBRUARY 15.

Architectural Association.—Mr. E. S. Prior on "Gothic architecture and the Basis of its Beauty." 7.30 p.m.
Royal Institution.—Professor J. J. Thomson, M.A., on "The Existence of Bodies Smaller than Atoms." 9 p.m.
Institution of Mechanical Engineers.—Mr. J. Ashford on "Light Lathes and Screw Machines." 8 p.m.
Sanitary Inspectors' Association.—Annual Dinner, Metropolitan Club, Holborn Restaurant.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Sanitary Law." III. 7 p.m.
Architectural Association of Ireland (Technical Demonstrations).—Mr. J. Early on "Glass Manufacture." 4 p.m. (at 1, Upper Camden-street).

SATURDAY, FEBRUARY 16.

Architectural Association.—First spring visit to the man Catholic and Cardinal's House, Ashley Down, Victoria-street, Westminster, by permission of architect, Mr. J. F. Bentley.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 24.—By W. Dew & Son (at Langfen).
Hempwys & Co., Anglesey.—The Cein Coch Estate, 481 a. f. (in numerous lots). £19,836

By NEWSON, EDWARDS, & SHEPARD.
Dalston.—73, Albert-st., f. r. 340. £570
Crouch Hill.—5, Birchwood Villas, f. r. 554. 690
Peckham.—3, Linnvale-rd., u. t. 97 yrs., g. r. 54. 300
Kensington.—73, Kensington High-st., beneficial lease for 70 yrs., r. 500l. 1,020
By WORSFOLD & HAYWARD (at Dover).
Dover, Kent.—St. James's-st., the Bell Inn, f. r. 607. 2,275
25, St. James's-st., f. r. 202. 275
East Studdale, Kent.—A freehold house, with market garden, orchard, &c., 12 a. 2 r. 270
January 26.—By REYNOLDS & EASON.
Penryn, Cornwall.—The Trimsaran Estate, comprising collieries, farms, &c., area, 714 a. 3 r. 5 p. f., including other mineral rights. 30,500
By HENRY HOLMES & CO.
Marylebone.—44, Charlotte-st., and 44, Goodge-st., f. r. 100. 4,200
101, Charlotte-st., u. t. 153 yrs., g. r. 120 l. r. 225 l. 1,950
Harrow, Middlesex.—41, Marlborough Hill, u. t. 68 yrs., g. r. 9 l. r. 40 l. 100
Kensington.—7, Brunswick-gds., f. r. 110 l. 1,885
Paddington.—7, Oakington-rd., u. t. 62 yrs., g. r. 6 l. r. 40 l. 430
By ROBINS, GORE, & MERCER.
Kentish Town.—178, Kentish Town-rd., u. t. 15 yrs., g. r. 8 l. r. 120 l. 300
By VENTON, BULL, & COOPER.
Maida Vale.—7, Randolph-gds., u. t. 30 yrs., g. r. 10 l. 585
Dulwich.—22 and 24, Elsie-rd., u. t. 72 yrs., g. r. 134 l. r. 68 l. 630
January 28.—By FREDERICK WARMAN.
Rotherhithe.—33, 39, and 41, Hawksford-rd., u. t. 50 yrs., g. r. 114 l. 108 l. 715
By FISHER, STAMHOPE, & DRAKE.
West Ham.—25, 29, 33, 35, and 39, Brownswood-villas, u. t. 78 yrs., g. r. 34 l. 1,500
Stoke Newington.—40, Clissold-rd., u. t. 47 1/2 yrs., g. r. 74 l. r. 51 l. 500
Stamford Hill.—15, East Bank, u. t. 84 yrs., g. r. 74 l. r. 50 l. 630
By DYER, SON, & HILTON.
Twickenham, Middx.—St. Margaret's-rd., Durham Lodge, and Earlham, u. t. 81 yrs., g. r. 20 l. r. 97 l. 108 l. 900
By WILKINSON, SON, & WELCH (at Brighton).
Brighton, Sussex.—8, Grand Junction Parade, f. r. 150 l. 2,100
January 29.—By HUNTER & HUNTER.
Chelsea.—33, Redesdalet-st., u. t. 51 1/2 yrs., g. r. 6 l. r. 25 l. 600
Clapham.—37 and 39, Hasehidge-rd., u. t. 61 yrs., g. r. 104 l. 12 l. 704 l. 715
By WALTER SIMMONDS.
Peckham.—13, 14, and 15, Pitt-st., u. t. 123 yrs., g. r. 9 l. 245 l. 240
Walworth.—44, Heygate-st., u. t. 42 yrs., g. r. 5 l. r. 38 l. 300
Camberwell.—9, Selborne-rd., u. t. 62 yrs., g. r. 5 l. 108 l. r. 30 l. 300
24, Sedgemoor-pl., u. t. 123 yrs., g. r. 4 l. 140
Camden Town.—35 and 36, Rochester-sq., u. t. 45 1/2 yrs., g. r. 104 l. r. 80 l. 885
By FREDERICK WARMAN.
Regent-st.—6, King-st., f. r. 100 l. 2,675
Marylebone.—29, Fitzroy-sq., beneficial lease for 121 yrs., r. 140 l. 200
Camberwell.—117, 119, 121, and 123, New Church-rd., f. r. 104 l. 1,100
Highbury.—56, Highbury New Pk., u. t. 48 1/2 yrs., g. r. 10 l. 108 l. r. 80 l. 800
Walworth.—44, 44, and 46, East-st., f. r. 123 l. 1,650
By WOOTTON & GREEN.
Wandsworth.—No. 359, f. r. 60 l. 830
By WYATT SON (at Haverly).
North Hayling, Hants.—Eastney Farm, 88 a. 3 r. 29 p. f. 2,000
Culter Farm, 59 a. f. r. 16 p. f. 630
Two houses, cottages, and 1 r. 26 p. f. 530
Lea Gardens and Grove's Fields, 14 a. 0 r. 36 p. f. 530
January 30.—By PHIBBS GIBSON & CO.
Dulwich.—12, Dulwich-rd., u. t. 32 yrs., g. r. 9 l. 108 l. 430
By R. TIDEY SON.
Holloway.—38, Bickerton-rd., u. t. 75 yrs., g. r. 6 l. 108 l. r. 38 l. 380
Highbury.—125, Riverside-rd., u. t. 69 yrs., g. r. 7 l. r. 40 l. 380
By WAGSTAFF & SONS.
Holloway.—17, 19, 21, and 23, Eden-grove, f. r. 107 l. 2,130
Canonbury.—58, Canonbury-rd., u. t. 17 1/2 yrs., g. r. 5 l. 108 l. r. 45 l. 323
13, Alwyne-villas, u. t. 17 1/2 yrs., g. r. 6 l. r. 36 l. 210
By T. G. WHARTON.
Fulham.—Ponsford-rd., f. r. 75 l. reversion in 97 yrs. 1,900
By BALCH & BALCH (at Camden Town).
Holloway.—3, Penn-rd.-villas, u. t. 47 yrs., g. r. 8 l. r. 45 l. 450
61, Cromwell-rd., u. t. 64 yrs., g. r. 10 l. r. 25 l. 205
St. Pancras.—3, Goldington-crescent, u. t. 48 1/2 yrs., g. r. 20 l. 325
74, 76, 78, 80, 82, and 84, Euston-st., u. t. 103 yrs., g. r. 107 l. 25 l. 830
27, Werrington-st., u. t. 48 yrs., g. r. 104 l. 62 l. 355
46 l. 255
4 and 5, Graynewoods, u. t. 42 yrs., g. r. 2 l. 255
By HARRIS & BULL (at Bromley).
Bromley, Kent.—3, Ravensbourne-rd., f. r. e. r. 35 l. 650
January 31.—By NORTON, TRIST, & GILBERT.
Battersea.—Battersdale, Tower Cottage, area 5,000 ft. 1,100
Chelsea.—15, Royal-avenue, u. t. 30 yrs., g. r. 74 l. r. 70 l. 700
Canonbury.—21, Canonbury-villas, u. t. 61 1/2 yrs., g. r. 8 l. r. 48 l. 270
By A. PREVOST & SON.
Mile End.—93, 95, and 97, Skidmore-st.; also 154, f. r. 108, u. t. 16 yrs., g. r. 8 l. 178
Plaistow.—Surrey.—a plot of building land, f. r. 100 105
High Ongar, Essex.—Nine Ashes, Box Cottage, f. r. 160
By JOSEPH STOWER.
Hoxton.—34, Baring-st., u. t. 31 1/2 yrs., g. r. 3 l. 158 l. r. 32 l. 380

February 1.—By PERCY H. CLARKE.
Putney.—Rochampton-lane, Ellenborough House and 6 a. 3 r. 38 p. f., f. r. 350 l. £5,600
Kensington.—40, 41, 42, and 43, Victoria-rd., u. t. 19 yrs., g. r. 21 l. r. 43 1/2 l. 4,120
Richmond.—12, Pagoda-avenue, u. t. 98 yrs., g. r. 10 l. r. 50 l. 420
43, Selwyn-avenue, u. t. 98 yrs., g. r. 74 l. r. 36 l. 310
By DOUGLAS & FRANK.
Notting Hill.—10, Ladbroke-gardens, u. t. 65 yrs., g. r. &c., 23 l. r. 100 l. 7,000
By F. & S. SMITH.
King's Cross.—33, Dennis-st., u. t. 41 yrs., g. r. 6 l. 280
Holloway.—10, Anston-rd., u. t. 65 yrs., g. r. 6 l. 205
Muswell Hill.—Muswell-rd., Fairview, u. t. 82 yrs., g. r. 10 l. 108 l. e. r. 45 l. 410
Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. r. for estimated rental; u. t. for unexpired term; p. a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table with columns: Material Name, Price per unit. Includes sections for BRICKS & CO., HARD STOCKS, ROUGH STOCKS, GRIZZLES, SMOOTH BRIGHT, FACING STOCKS, SHIPPERS, FLETTONS, RED WIRE CUTS, BEST FAREHAM RED, RUSSIAN FACING, BEST BLUE PRESSED, STAFFORDSHIRE, DO, BULLNOSE, BEST STOURBRIDGE, FIRE BRICKS, GLAZED BRICKS, BEST WHITE AND IVORY GLAZED, STRETCHERS, HEADERS, QUOINS, BULLNOSE, AND FLATS, DOUBLE STRETCHERS, DOUBLE HEADERS, ONE SIDE AND TWO ENDS, TWO SIDES AND ONE END, SPLAYS, CHAMFERED, SQUINTS, BEST DIPPED SALT, GLAZED STRETCHERS AND HEADERS, QUOINS, BULLNOSE, AND FLATS, DOUBLE STRETCHERS, DOUBLE HEADERS, ONE SIDE AND TWO ENDS, TWO SIDES AND ONE END, SPLAYS, CHAMFERED, SQUINTS, SECONDARY WHITE AND DIPPED, SALT GLAZED.

Thames and Pit Sand 7 6 per yard, delivered.
James Ballast 6 3 "
Best Portland Cement 38 0 per ton "
Best Ground Blue Lias Lime 25 6 "
NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime 13s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. 6d. per ton at ry. dep.

Table with columns: Material Name, Price per unit. Includes sections for STONE, Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Grinstead, Brown Portland in blocks, Darley Dale in blocks, Red Corshill, Best Mansfield, Hard York in blocks, Hard York in blocks, sawn both sides landings, to sizes (under 40 ft. sup.), 6 in. Rubbed Ditto, 3 in. sawn both sides slabs (random sizes), 3 in. self-faced Ditto.

SLATES.

Table with columns: Material Name, Price per unit. Includes sections for 20x10 best blue Bangor, 16x8 best, 20x10 best blue Portlana, 16x8 best blue Portlana, 20x10 best blue Portlana, 16x8 best blue Portlana, 20x10 Permanent green, 16x8.

[See also page 149.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Table with 4 columns: Nature of Work, By whom Advertised, Premiums, and Designs to be delivered. Includes entry for Sewerage Scheme.

CONTRACTS.

Main table with 4 columns: Nature of Work or Materials, By whom Required, Forms of Tender, &c., Supplied by, and Tenders to be delivered. Lists various construction projects and their contractors.

[See also next page.

PUBLIC APPOINTMENTS.

Table with columns: Nature of Appointment, By whom Advertised, Salary, Application to be in. Lists various roles like Clerk of Works, Draughtsman, Assistant Surveyor, etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, pp. iv, vi, viii, x, & xxi. Public Appointments, pp. xviii, & xxi.

PRICES CURRENT (Continued).

TILES. Table listing prices for various types of tiles like plain red roofing tiles, Hip and valley tiles, etc.

WOOD. BUILDING WOOD.—YELLOW. Table listing prices for different wood types and sizes.

WOOD. Table listing prices for various wood products like malletting Danzig, Melmel, etc.

WOOD. Table listing prices for various wood products like first yellow deals, second yellow deals, etc.

WOOD. Table listing prices for various wood products like white deals, second white deals, etc.

WOOD. Table listing prices for various wood products like regular sizes, broads, etc.

WOOD. Table listing prices for various wood products like joists, girders, etc.

PRICES CURRENT (Continued).

METALS. Table listing prices for various metals like iron, steel, etc.

METALS. Table listing prices for various metals like sheet iron, galvanized, etc.

METALS. Table listing prices for various metals like lead, zinc, etc.

METALS. Table listing prices for various metals like brass, copper, etc.

METALS. Table listing prices for various metals like tin, solder, etc.

METALS. Table listing prices for various metals like blowpipe, etc.

METALS. Table listing prices for various metals like oils, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any communication to a contributor to write an article is given subject to the approval of the editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

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

ALFRISTON (Sussex).—For alterations to The Star Inn, for Messrs. Page & Overton, Limited. Mr. A. Broad, architect, 22, George-street, Croydon:— Peeries, Dennis, & M. Hookham, East-Co., £568 | M. Hookham, £370

CROYDON.—For three houses, Temple-road. Mr. A. Broad, architect, 22, George-street, Croydon:— J. J. Cooper, Sutton £1,800

CROYDON.—For alterations to No. 66, Church-street, for Messrs. J. Thirt & Sons. Mr. A. Broad, architect, 22, George-street, Croydon:— Smith & Son £525 | Pearson & Co. £460 Akers & Co. 523 | W. Potter* 450

HIGH WYCOMBE.—For new billiard-room and additions, Hill Side. Mr. Arthur Vernon, architect, 29, Cockspur-street, London, S.W., and High Wycombe:— Hunt & Son, £1,365 | G. H. Gibson* £1,265

LEWES (Sussex).—For alterations to The Fountain Inn, for Messrs. Page & Overton, Limited. Mr. A. Broad, architect, 22, George-street, Croydon:— J. Floyd £320 | W. Wells £268 M. Hookham 281

LONDON.—For alterations and repairs to the Rotunda, No. 3, Blackfriars-road, S.E. Mr. A. Broad, architect, 22, George-street, Croydon:— Woodward & Co., £1,116 | Bulled & Co. £946 Smith & Sons, Ltd., 1,040 | W. Potter* 797 D. W. Barker 980

MITCHAM.—For erecting a cottage, Percy-road, Beddington-corner. Mr. A. Broad, architect, 22, George-street, Croydon:— J. J. Cooper* £365

SOUTH SHIELDS.—For rebuilding the Blue Bell Inn at Ryhope, Sunderland. Mr. Henry Grieves, architect, Albany Chambers, South Shields:— Taylor & Welford, Sunderland* £3,255

LONDON SCHOOL BOARD TENDERS. At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:— BONNEVILLE-ROAD SITE.—Providing and fixing fencing, &c.:— Leslie & Co., Ltd., £1,810 | King & Son £1,577 Holloway Bros. 1,794 | E. Briggs 1,543 Lorden & Son 1,750 | Lathey Bros* 1,495 C. Wall 1,700

BUCKINGHAM-TERRACE.—Laundry centre on arches:— Leslie & Co., Ltd., £1,810 | King & Son £1,577 Holloway Bros. 1,794 | E. Briggs 1,543 Lorden & Son 1,750 | Lathey Bros* 1,495 C. Wall 1,700

CHILDERLEY-STREET SITE.—Providing and fixing fencing, &c.:— W. R. & A. Hide £45 18 | W. Hammond* £38 15 Mitson & Co. 40 0

[See also next page.]

Repairs to heating apparatus on Schedule.—Groups 1, 2, 5, 8, 9, 10, 11, and 12.

Contractors.	Group 1.	Group 2.	Group 5.	Group 8.	Group 9.	Group 10.	Group 11.	Group 12.
G. & E. Bradley ..	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
W. G. Cannon & Sons ..	+20	+20	+20	+15	+15	+15	+15	+20
J. DeRIES & Son, Ltd. ..	+17½	+17½	+17½	+17½	+17½	+17½	+22½	+22½
Brightside Foundry and Engineering Co., Ltd. ..	+15	+15	+15	+10½	+10½	+15	+15	+15
J. Eason ..	+15	+15	+10	+10	+10	+17½	+12	+17½
J. & F. May ..	—	—	+52½	—	—	—	—	—
A. A. Morris & Co.	—	—	—	+25	—	—	—	—
J. Wontner-Smith, Gray & Co.	+30	+30	+30	+30	+32½	+32½	+35	+35

FOSSDENE-ROAD.—Manual training centre for city boys:—
Garrett & Son..... £1,450
King & Son..... 1,448
F. & H. F. Higgs .. 1,470
Bulled & Co. 1,385

GEORGE-STREET.—New school for infants on one floor: Accommodation, 350. Providing new water-closets for male and female infants, and covered playground:—

Wall & Co.	£8,001	+ £129
Bulled & Co.	7,979	+ 99
Johnson & Co.	7,849	+ 120
F. and H. F. Higgs ..	7,492	+ 83
Wallis & Sons ..	7,152	+ 69
J. Appleby ..	7,174	+ 95
W. Downs ..	7,069	+ 125
Holliday & Greenwood.....	7,039	+ 79
J. & C. Bowyer ..	6,392	+ 75
W. Smith ..	6,381	+ 76
J. Marsland & Sons* ..	6,133	+ 60

* If walls of classrooms are plastered, add.

HAVERSTOCK-HILL.—Building coal-cellar in playground against Furo-street:—
General Builders, Ltd. £297
Thompson & Beve-ridge .. 150
H. Eady .. 143

LEVEN-ROAD SITE.—Providing and fixing fencing, &c.:—
Gibb & Co. £172
Hawkins & Co. 153 10

MACMURDO-ROAD SITE (Woodlawn-road).—Removing one building from Amber-road, one from Clifton-road, one from Etringham-street, and three blocks of offices from Rosendale-road, and re-erecting them on the Macmurdo-road site:—
T. Crawley .. £1,665
I. & W. T. Hunter .. 1,365
Crogon & Co., Ltd. .. 1,310

PONTON-ROAD.—Drainage and sanitary work:—
Rice & Son .. £2,390 0 0
Lathey Bros. 2,362 0 0
Johnson & Co., Ltd. 2,343 0 0
Maxwell Bros., Ltd. 2,321 16 8
Martin, Wells, & Co. 2,224 0 0
W. Hammond .. 2,219 4 5
I. & C. Bowyer .. 2,151 0 0
H. & G. Mallett .. 1,944 9 3
W. V. Good .. 1,859 0 0
E. Triggst. 1,849 0 0

† Recommended for acceptance.

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Perry & Co. 5,539
L. H. & R. Roberts .. 5,516
Grover & Son .. 5,502
F. & F. J. Wood .. 5,491

Munday & Sons .. £5,476
Lawrance & Sons .. 5,226
Wall & Co. 5,199
Staines & Son .. 5,181
Gregar & Son .. 5,157
Chessum & Sons* .. 4,998

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Lascelles & Co. 35 0

Educational Supply Association, Ltd. £33 10

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The Builder.

VOL. LXXX.—No. 2028

FEBRUARY 16, 1901.

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Choir Stalls, Lincoln Cathedral.—Drawn by Mr. James McLachlan (Pugin Student, R.I.B.A.)	Double-Page Ink-Photo.
The Choir, Lincoln Cathedral, and Galilee Porch, Ely Cathedral.—Drawn by Mr. James McLachlan (Pugin Student, R.I.B.A.)	Two Single-Page Ink-Photos.
Ancient Remains in Crete (An Illustration of Mr. Fyfe's Paper at the Architectural Association)	Double-Page Ink-Photo.
Turkish Buildings at Broussa (An Illustration of Mr. Fyfe's Paper at the Architectural Association)	Double-Page Ink-Photo.

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The History of the Housing Question in London.



THE approach of another election for the London County Council makes it opportune to give something in the nature of a sketch of the progress of the Housing Question in the Metropolitan. Both Progressives and Conservatives, as the so-called Moderates have now called themselves, admit that the Housing Question is the most important with which they have to deal. Not a little pessimism prevails regard to it, and we should be the last to take a sanguine view of this difficult problem, yet a review of the last half-century will show that great progress has taken place. No doubt, the subject has been growing in complexity and in difficulty, but at the same time both the Legislature and Local Authorities have taken many important steps deal with it.

The first part of this question is concerned with the progress of legislation, and in noticing it we shall follow the useful, and, indeed, indispensable, work on the subject which has lately been issued by the County Council.* So far as the Authorities of the Metropolitan are concerned, it is desirable to point out that from 1855 to 1889 London was governed by the Metropolitan Board of Works, and by Vestries and District Boards. In 1889 the County Council came into existence under the provisions of the Local Government Act, 1888, and in 1900 the new municipalities, of which we have heard recently so much, superseded the Vestries and District Boards. But we have to go back to the year 1851 to find the beginning of modern legislation on the housing question in London, so that, roughly speaking, both legislation and local action have arisen

during the lifetime of the existing generation of Londoners. If we bear this fact in mind it should encourage us in regard to future progress.

It was in 1851 that Lord Shaftesbury (then Lord Ashley) brought the housing question before the House of Commons, and his efforts resulted in the passing of two statutes, the Common Lodging Houses Act, 1851, and the Labouring Classes Lodging Houses Act. Not only is it to Lord Shaftesbury that the perpetual honour belongs of directing public attention for the first time to this question, but he had the unique privilege of piloting these measures through both Houses of Parliament, for he succeeded to the peerage while this legislation was in progress. The first Act was passed with the object of improving the quality of the houses, the authority for that purpose being the Commissioner of Police and the Secretary of State, and it was not until 1894 that the jurisdiction of the former official was transferred to the County Council. By the second Act, it was proposed to increase the quantity of dwellings by enabling Local Authorities to adopt the Act and purchase, lease, or build such dwellings as were needed. Here then we have the germ of the important legislation which ensued to the end of the century to provide more dwellings for working men.

To return, however, to the quality of the houses; passing over the Nuisances Removal and Sanitary Act of 1855 and 1866 we come to the year 1868, in which year was passed the first of the series of statutes known as "Torrens' Acts." The main principle of the measure was that "the responsibility of maintaining his house in proper condition falls upon the owner, and that if he fails in his duty, the law is justified in stepping in and compelling him to perform it." The manner in which the owner was obliged to fulfil this duty was, broadly speaking, by the appointment of medical officers of health to report to the Local Authority, who then had jurisdiction to oblige the owner to do such work as was necessary, or even to demolish insanitary houses.

In seven years time we reach a legislative period which may be regarded as the contemporary or modern one, since in 1875 we come to the Artisans' and Dwellings Improvement Act, the first of the series known as "Cross's Acts." This Act dealt with "whole areas, when the houses are so structurally defective as to be incapable of repair." The authorities to whom the duty of carrying it was given were the Metropolitan Board of Works and the City Commissioners of Sewers. The main point to bear in mind in regard to this statute is that it is the beginning of the work which has been going on for the last quarter of a century for the wholesale rehousing of the working classes. The machinery for carrying it out was soon seen to be cumbersome, and in 1879 it was amended. In 1882 we find an important measure, the Artisans' Dwellings Act, 1882, to amend both Torrens' and Cross's Act, which again is a simplifying Act. Then from that time follow in due order the Housing of the Working Classes Acts of 1885 and 1890 and 1894. This review will give some kind of idea of the amount of legislation which has taken place during the last half century. Space wholly prevents the consideration of the details of these voluminous statutes. It is desirable, however, to endeavour to form some kind of idea of the practical results of this legislation.

In the first place the action of the predecessors of the County Council, the Metropolitan Board of Works, must be reviewed, which covers the period extending from 1875 to 1882. The number of schemes undertaken during this space of time was sixteen, which extended over an area of forty-two acres, and provided for 27,780 persons, as against 22,868 persons displaced. The actual cost worked out as follows:—Of property, 1,570,160*l.*; of works, 99,836*l.*; as against receipts, 346,581*l.*; leaving a total net cost of 1,323,415*l.* Between the schemes of the Metropolitan Board of Works and those of the County Council come some of an intermediate kind, begun by the one body and completed by the other.

These are six in number, and provided

* "The Housing Question in London."—Prepared to the order of the London County Council, under the direction of C. J. Stewart, Clerk of the Council.

accommodation for 2,930 persons though 6,188 were displaced. This curious discrepancy is explained by the fact that in one case the site was by Act of Parliament devoted to the purpose of an open space, and that in other cases the number for whom accommodation had to be provided was reduced by modification orders. Be that as it may, there is in regard to these six schemes the unsatisfactory fact that, apparently, over 3,000 persons were displaced and scattered into other districts already too crowded. The total net cost of these works was 281,673*l*.

We now come to the work which has been done, or is being carried into effect, by the London County Council. The schemes seem to be twelve in number. They affect an area of 34½ acres. The total number of persons displaced by these schemes was 16,278, and the number actually rehoused 6,808, and to be rehoused 9,416. As regards expenses of the work, the total actual net cost to March 31, 1900, was 592,549*l*. In addition, schemes have been undertaken by Vestries and District Boards affecting a displacement of 4,042 persons. In addition the Council has undertaken various projects under Part III. of the Housing of the Working Classes Act, 1890, which is concerned—as many of our readers are aware—with what may be called lodging requirement. Under this head we find that there has been a supply of 2,132 tenements containing 5,012 rooms. It is impossible to enter into details of these schemes, but the entire work is apparently summarised in the table given with this article, taken from the appendix to the Report already referred to.

Considerable as is the work done, as pictured by these statistics, it is obvious, when the growth of London and its suburban districts is borne in mind, that it is comparatively little in comparison to the increase of population. We see that even with great expenditure of money and labour the requirements of the artisans of London can scarcely be coped with, and the conclusion to which one must apparently arrive is that while municipal effort should be increasing, as much encouragement as possible should be given to individual enterprise. It seems to be clear that the housing problem can only be adequately grappled with by the combined effort of public bodies and private companies, and therefore that municipalities should not crush out private enterprise. Those who are interested in this great social problem will

find much that is valuable in the Report upon which the foregoing remarks have been based, and by a perusal of it better appreciate at once its magnitude and its difficulty.

HINTS ON STABLES.

BY A HUNTING MAN.



WISH it to be clearly understood at the outset of this article that I am neither an architect, nor connected in any way with the building industry. I am writing without prejudice, and therefore trust that my remarks and suggestions will be construed in the same spirit in which they are written. My objects are to promote the welfare of the horse and to save the owners of horses unnecessary expense, which arises from inferior stable accommodation.

At the beginning of the century an ill-drained, ill-ventilated, ill-lighted barn was considered a good enough home for the average hunter. Even within the last twelve months I have seen many of these barns attached to old country houses, and I have inspected stables in London which are little better than cowsheds. In London and other large towns where economy of space is a primary consideration there may be some excuse for narrow gangways, narrow stalls, and narrow doors; but in the country there is no such excuse for placing valuable horses in erections which are the hot-beds of disease, owing to want of sanitation and space. Then how often are the situation and aspect of a stable misjudged. In the case of stables built at the beginning of the century we constantly find that they are situated in a valley on account of the warmth and shelter; but if the windows and doors fit properly and the ventilators act properly, so that there is no unhealthy draught, the question of shelter need not arise.

In regard to ventilation, there is a popular idea that ventilation merely means draught. A greater mistake cannot be made. The proper definition of ventilation is "the ingress of fresh air and the egress of foul air." Let us now consider what is the best method to ensure perfect ventilation in a stable. My own opinion is that there should be one or more according to the size of the stable, ventilating shafts in the roof, and one or more on each side of the walls. These should have "louvre" boards and cords to allow of them being opened or

closed, as the exigencies of the weather may demand.* Furthermore, there should be ventilating gratings a few inches from the wall on all the walls, furnished with closing bars. I have only heard one objection to this system of ventilation, namely, that in many private stables, if there were a hundred ventilators, the grooms would never dream of opening one of them, and the stables would still be found reeking with foul air laying the seeds for every imaginable form of lung disease. What does this objection amount to? It simply means that the owner of valuable horses does not employ servants upon whom he can rely to fulfil their duties. The groom who keeps his stable hot in order to make the coats of his horses shine is like the Chinaman who burnt his house so that he might roast his pigs.

The first thing which an architect has to consider is the aspect of a stable. The aspect should be south or south-west, so that the horses face north or north-east. The stable will thus gain the greatest possible amount of light with the least possible amount of glare to the horses. The situation of the stable should be on dry soil when possible, but never in a valley. It is not necessary to build a stable in a low valley in order to obtain the temperature at which it should be kept, namely, 60 deg.

The construction of the outside walls of a stable has been the cause of much difference of opinion. If possible, that is to say if the stable is near to a quarry, they should be of hard stone, since bricks absorb moisture and cause the stable to become damp.† I am an advocate of corrugated iron, lined with wood, providing that there is ample space between the iron and the wood, which could be filled

* "A Hunting Man," however, does not state whether he intends these for inlets or extracts, and possibly does not know. If intended as extracts, probably some of them will be found acting as inlets. And what is to induce them to act as extracts? To adopt his own phrase, "there seems to be a popular idea" that it is only necessary to have openings, and the fresh air will flow in through one and the foul air out at another, just as you wish, without anything more than wishing. If no mechanical force is employed, the best chance is to have only one ultimate extract at the highest point of the building; there may be ducts to it from different parts of the stable ceiling. In large stables—those containing as many as ten horses and upwards—it ought to be worth while to have a mechanically driven extract fan, but it must be used with moderation, so as not to draw in anything like a rapid current of air through the inlets.—E.D.

† This is, of course, far too sweeping a statement. It depends on the kind of stone and the kind of brick. Some bricks absorb much less moisture than many stones do.—E.D.

Table Extracted from the Work on "The Housing Question in London," issued by the London County Council.

By whom the areas have been or are being dealt with or dwellings have been erected.	Unremunerative work.			* Remunerative work.						Total number of tenements.	Total number of persons provided for or to be provided for.	Estimated cost of dwellings (including value or cost of land and all incidentals).	Gross rent receivable per annum in respect of tenements actually occupied.			
	Extent of areas dealt with or being dealt with.	Number of persons displaced or to be displaced.	Estimated or actual net cost of clearances.	Number (so far as can be ascertained at present) of tenements of												
				1 room.	2 rooms.	3 rooms.	4 rooms.	5 rooms.	6 rooms.							
By the Metropolitan Board of Works	Acres.	29,035	1,605,088	—	—	—	—	—	—	—	—	—	—	—		
By the Council	51½	14,422	1,043,250	124	280	1,444	179	0	—	3	4,038	27,780	1,221,418	8 9	35,164	8 0
By the Council and a Vestry	3½	1,355	69,750	—	—	—	—	—	—	—	—	—	—	—	—	—
By a Vestry or District Board and the Council	8½	4,042	178,728	—	—	—	—	—	—	—	—	2,052	—	—	—	—
By a Vestry	—	—	—	—	25	30	—	—	—	—	75	400	27,336	0 0	1,527	10 0
Totals	94½	49,375	2,898,616	124	2,95	1,494	179	8	—	3	4,113	64,428	1,248,754	8 9	36,691	18 0

* No work of this character was done by the Metropolitan Board of Works. Such figures as are given relate to what has been done by other bodies upon land purchased by them from this Board.

† Of this number, accommodation for 240 was provided by the Provident Association. The total also includes persons provided for in lodging-houses.

‡ This does not include any figures in respect of the Russell-court site, nor in respect of any rehousing in connexion with the schemes of 1899.

with sawdust or some other non-conducting material.* This provision is important, since a careless builder neglects to use sufficient non-conducting material, the corrugated iron will in hot weather turn the stable into a furnace. Some architects recommend painted cement in preference to wood for the inside lining of the walls, since it is easier to keep clean and is more economical; but there is an unsportsmanlike look about the cement, and the appearance of wood is far superior to that of cement. Then horses do not care to live in a place resembling an Ebenezer Chapel, and in the construction of our stables the horse is the first interest to be considered.

In regard to the external construction of a stable, no subject has aroused such divergence of opinion amongst hunting men than that which concerns the roof. Many hunting men are in favour of a thatched roof, because it is warmer in winter and cooler in summer. But there are many objections to thatched roofs. In the first place, it is difficult to find a good thatcher outside Dorsetshire, and a badly thatched roof is useless. In the second place, they absorb more damp than any other kind of roof, as anybody who has had the misfortune to live in a thatched house can testify. Thirdly, they are expensive in regard to the initial cost, and constantly need repairing. Fourthly, they serve as breeding places for vermin. Fifthly, they are a source of danger from fire. The late Mr. Ruskin stated that they were a pleasing prospect in the landscape. I willingly admit that, to the artistic eye, a thatched roof is a pleasant appendage to a country parsonage, though the parson's fat cob may differ from me; but a thatched roof on a gentleman's stable always reminds me of a dilapidated farmhouse. If we discard thatched roofs, we must alternate between slates and tiles. My chief objection to slates is that they generate more heat than tiles, while the ugliness is so apparent to require any comment from my pen. Good tiles, well laid, form the best of which I have had experience.

"Let the gutters from each stall or box run direct into one common gutter, which traverses the stable from one end to the other, and the further the gutter is extended beyond the stable in its open form before it received into any underground drain the better. As far as stable drainage is concerned, nothing further is necessary." Such is the *dictum* of Major Fisher, as written in his admirable little book, entitled "Through the Stable and Saddle Room," and his words convey the necessary advice to those connected with the construction of a stable drainage. It is my duty to warn my readers against the modern systems of borate drainage. The more simple the system of drainage is, the more healthy it is for man and horse. Moreover, it requires a special education to understand the complicated sanitary arrangements which have been introduced into stables during the last decade. Simplicity and cleanliness should be the two most important features of a stable. We cannot expect a stable-lad to keep in order drainage, when he is ignorant of the structure of the drainage.

A Hunt secretary, who is also a farmer

This may no doubt make a warm and comfortable stable, but few owners of large country houses would like to see their stable court disfigured by so hideous a material as corrugated iron.—E.D.

We should really be interested to know in what sense the word "unsportsmanlike" is used.—E.D.

and a breeder of horses, once stated to me that he only required the services of a veterinary surgeon in order to test the eyesight of a horse. Now, the bad eyesight of horses is invariably due to the misplacement of the windows in the stable. The windows of a stable should be behind the horses, facing south or south-west, unless the aspect be north or north-east, when the windows must be placed in front of the horses, and as near the ceiling as possible, so as to prevent any glare in front of the horses' eyes. Lattice windows are preferable to those made of squares of glass; but in either case they should be made to open upon pivots, and have holland blinds to shield the glare of the sun. One window to three stalls or loose-boxes is sufficient, unless the aspect is closed in by trees or other buildings. Whether or not there should be trees or shrubs in the vicinity of a stable has long been a controversial subject amongst the owners of valuable horses. My own experience is that verdure attracts atmospheric moisture, and thereby prevents the moisture from reaching the stable.

In reference to the internal structure, in the first place, let us consider the position of the forage loft. Should it be between the ceiling and roof of stable? Such a situation is the most convenient, so far as the grooms are concerned, and, moreover, serves to keep the stable warm. But in any case the forage should be stored near to the stable, and, wherever possible, in the same building. I recently considered some designs for stables in which the architect had placed the forage loft fifty yards from the stable. I will not refer to the extra labour entailed to grooms by such an arrangement, but how about the forage on a wet night? I should not like to eat my food sodden with rain water, and I do not think that my horses would care to do so. In regard to stables the horse is the first object for consideration, and yet how often do we see valuable horses ruined on account of inadequate stable accommodation! The stiffest fence in Leicestershire is a bagatelle when compared with a narrow stable-door. The door of the stable should be at least six feet, or, if possible, seven feet in width, since in passing through a narrow doorway horses are apt to knock themselves against the side-posts, and to do themselves serious injury. The doors should be half-doors, cut horizontally in the centre, and there should be no projections of any sort or kind whatsoever in the door. Sunken bolts and ring handles obviate any necessity for such projections, which are more liable to injure a horse than barbed wire.

The flooring of a stable should be of the hard corrugated or grooved blue bricks, specially manufactured for stable purposes. These should be so carefully laid that the grooves fit into one another, and thereby form a miniature system of drainage. The gangway should be as wide as space permits, but not less than 8 ft. in width, and the surface should be level. The slope of the surface flooring of a stall or loose-box has for many years been a subject of disagreement amongst men of the greatest experience in all matters connected with the stable; but, with the exception of the late Duke of Beaufort, who favoured a flat surface, the majority of hunting men consider that the gradient of a stall or loose-box should be $\frac{1}{2}$ in. in 13 ft. I do not like to differ from such an authority as the late Duke of

Beaufort, though in most hunting and racing stables the gradient which I have described is adopted. The reason for the adoption is obvious. If a rider wants to stand still by covert-side or anywhere else, and leaves the position to his horse, the horse will choose to place his forelegs on an elevation on a proportionate gradient to his hindlegs to the one which I have described. Surely, therefore, this gradient must be the most comfortable and the most natural for the horse. I may also add for the benefit of hunting men who may read these words, that when the surface is flat, horses contract the pernicious habit of "standing over."

I do not think that there can be any difference of opinion between the relative merits of stalls and loose-boxes. Unfortunately, space often prevents the use of loose-boxes, but it is easy to improvise them by placing strong bars of oak from the stall posts across the gangway to the wall. This is a method which I have often seen adopted in old stables. The economical objection to loose-boxes, namely, that they take more straw to litter them than it takes to litter stalls has long been exploded, since it must be apparent to everybody connected with stable management that the greater the space to be littered, the less amount of straw will be soiled, trodden upon, and have to be removed. In regard to size, twelve feet by thirteen feet is a fair size for a loose-box, and thirteen feet in length by eight feet in width a proper size for a stall. These dimensions may seem extravagant to some of my readers but they must remember that there is nothing more dangerous than for a horse, excited by the idea of leaving the stable, to be obliged to turn round in a narrow stall.

In regard to interior fittings, my primary statement is that there should be nothing superfluous in a stable, and that all the fittings should be as simple as possible. *Simplex munditiis* should be the motto for a stable, as our old friend Horace, who was the cause of many bad hours to me in my Rugby days, said should be the motto of ladies. The more superfluity that there is in a stable, the more dirt and dust, and the more things to be kept clean. Briefly, the greater the simplicity, the greater will be the tidiness. The stall partitions should be made of oak or pitch-pine boards; for it is false economy to use deal, which is liable to splinter, and has accordingly to be constantly renewed. These partitions are now made so as to be movable. Thus by removing the partition and putting up the oak bars already referred to on the two adjacent partitions, a loose-box, sufficiently roomy for the most capricious animal, can be made in a few minutes, and every hunting man will agree with me that after a long day the horse will appreciate the luxury. Space does not always permit of the erection of loose-boxes, though it is seldom that an owner of hunters does not possess a spare stall, by which, by the use of the movable partition, he can get a loose-box when required. The mangers in any stable should be made of enamelled iron, for wooden mangers tend to make horses crib-biters. Moreover, wooden mangers are not so easy to keep clean as those made of enamelled iron. One modern improvement which I strongly urge my readers to use is an enamelled basin or water trough, which can be bought and fixed in a stall or loose-box at a trifling cost, so that the horse can drink when he feels

thirsty. The old habit of giving horses their water out of a bucket at stated intervals always reminds me of Fagin telling Oliver Twist to drink his gin-and-water because another gentleman required the glass. The stomach of a horse is not like the boiler of an engine, though many people fail to see the difference.

In conclusion let me state that there should be no cupboards in a stable, but only shelves upon which nothing but the grooming utensils should be placed. With the exception of a dung basket, the stable utensils should be kept in the saddle-room. But the architecture of the saddle-room would demand a separate article.

NOTES.

IN accordance with the new Tilers and Bricklayers' working rules, a Joint Conciliation Board meeting was held at the offices of the London Master Builders' Association on Monday, the 28th ult. There were present on the occasion five representatives of the London Master Builders' Association, three representatives of the Operative Bricklayers' Society, and three representatives of the Slaters' and Tilers' Union. The question to be considered was the claim put forth by the Operative Bricklayers' Society that its members should have the exclusive right to do roof tiling; and the questions submitted to the board were:—(a) Is roof tiling to be given exclusively to tilers? (b) Is roof tiling to be given exclusively to bricklayers? (c) Shall roof tiling be done by bricklayers or tilers, at the discretion of the employer? The result was that it was decided by the majority of the board "That it shall be left to the employer to elect whether he shall employ bricklayers or tilers to do roof tiling." This is the common-sense of the matter. It all depends on the character of the work to be done, and the necessity or otherwise of skilled labour; and of this the employer has the best right to judge.

IN our note on the Luton Hoo tapestry case when it was decided by Mr. Justice Byrne, it was pointed out that the reasoning by which it was held that the tapestry in the drawing-room was a fixture, and belonged to the freehold, was fallacious. The decision has now been reversed by the Court of Appeal. There appears, however, to be a tendency to attribute too wide an inference to the new decision, and to regard it as having extended the law by giving greater liberality to it in regard to the rights of tenants for years or for ever as against a freeholder. No doubt law always reflects, sooner or later, the general feeling of the community, and public opinion is distinctly in favour of limiting the rights of freeholders to property for which they have not paid. This is most noticeable in agricultural tenancies, but the same trend of public opinion is reflected in such a decision as that of the Court of Appeal on the Luton Hoo case, in which the Judge of First Evidence took a narrow and technical view. At the same time, where there is any possibility of disputes arising as to what is or is not a tenant's fixture, it would be desirable for tenants to obtain a written license from the freeholder to erect fixtures, with the condition that they do not belong to the freehold. It is obvious that as long as the law on this

subject remains in its present somewhat indefinite condition, there must always be a certain danger of disputes. No doubt some class legislation on the subject is desirable by which the rights of tenants would be clearly defined and safeguarded. But modern legislation is so confused and muddled—as witness the Workmen's Compensation and other Acts—that it is sometimes worse than the evil which it is intended to remedy.

THE proposal to restore Linlithgow Palace as a memorial of our late Queen seems to us a rather foolish one. There is no suitability in it as a memorial to Queen Victoria; the name of the place will always be connected historically with that of a feminine royalty of a very different type; and as a matter of archaeological interest it would be a great deal better to leave the building as it is instead of "restoring" it into a modern building. All that seems necessary is to provide against its further decay.

ALTHOUGH the casual visitor to Newcastle may find little temptation to cross the river in search of the beautiful, there is, and has been for years, urgent necessity for more adequate means of railway communication between the banks of the Tyne. Apart from the heavy toll payable by the railway company to the owners of the High-level Bridge, this structure notoriously offers insufficient accommodation for the heavy local and main line traffic of the present day. Moreover, its position with regard to the Central station renders necessary for through trains a change of engines, causing expense and delay to the railway company, and a reversal in the relative position of the carriages, causing discomfort to many passengers. A second railway bridge, with four sets of metals, is now to be built, crossing the Tyne from Gateshead near the Redheugh bridge, and entering the passenger station at the western end. The new structure is to be of the lattice girder type, having two spans resting on a central pier of granite. On the south side of the river the approach will afford communication with the main line a little below Gateshead Station, with which connexion will be made by means of a loop line, so that the utmost advantage may be derived from the addition of the new bridge. Each span of the bridge will be about 300 ft. long, the total length being 675 ft., and the height above high-water level to the lowest rail of the bridge is to be 85 ft. The structural details of the northern approach are not yet finally settled by the engineer.

A CORRESPONDENT writes:—"I presume that the leading architects of Wiltshire are working hard to obtain the tempting bait held out to them in the enclosed advertisement, cut from the *Wiltshire Times* of February 9 inst." The following is the advertisement referred to:—

"TO ARCHITECTS.—The Trustees of the proposed New Wesleyan Church and Schools at Chippenham invite Pencil Sketch of Buildings, including Elevation, Ground Plan, and Section. Terms: Ten guineas for design selected, the same to be the property of the Trustees, without prejudice to any future action."

The hon. secretary to the Committee is the

minister. We are inclined to think a clergyman of the Established Church would have known better than this, at all events.

WE understand that Mr. Allan Wyon, F.S.A., chief engraver of his Majesty's seals, has received instructions for the making of new Great Seal. Mr. Allan Wyon is the third son of Benjamin Wyon, who in 1831 succeeded his father, Thomas Wyon, as chief engraver of his Majesty's seals, and was succeeded in that appointment by his three sons in turn—Joseph Shepherd Wyon in 1858, Alfred Benjamin Wyon in 1865, and Mr. Allan Wyon in 1884. The Wyon family were originally of German extraction and reckon amongst their members the Court jeweller of King George I., Thomas Wyon the younger, chief engraver at the Mint, and his successors at the Mint, Leonard Wyon and William Wyon, R.A., F.S.A.

WITH the demolition, now in progress, of the massive gateway and the Governor's house at Mount Pleasant, Clerkenwell, will disappear the only remaining portions of the old prison that was closed in November 1885. The stone gateway, having a lion's head and rusticated voussours around the arch and inner piers in the archway, is the last of its kind in London. It has retained the original doors with their two big iron knockers, but the linked fetters on the outer piers and the inscription beneath the cornice—"1794 Middlesex House of Correction 1866"—have been removed. In pursuance of the Act 26 Geo. III., c. 55, the erection of the prison was begun upon a site of marshy ground, nine acres in extent, bounded along its west side by the Fleet, which the county magistrates bought for 4,350*l.* from Thomas Clarke Jervoise. Plans and designs for 232 cells were prepared by Sir Robert Taylor after whose death in 1788 the works were carried on by Sir William Chambers in 1788-91, and then after Chambers's death in 1796 by T. Rogers. The prison, first opened in 1793, was enlarged and remodelled in 1830 by Robert Sibley with five blocks radiating from a common centre, to the north of the older buildings, and on such a scale as to render it the finest and one of the best appointed goals in the kingdom, with a capacity latterly for 1,558 prisoners. On the east side, in a detached building, was the great treadwheel for grinding corn (since removed to Pentonville), with room for 350 at a time of the prisoners condemned to hard labour for periods known as "short sentences"—two years or shorter. Upon the removal of the prisoners to Pentonville protracted negotiations ensued between the Clerkenwell Vestry, the Home Office, the late Metropolitan Board of Works, and the London County Council in respect of a project to secure the ground, partly as an open space and partly for the building of artisans' dwellings. In the result the site was acquired under the Post-office Sites Act, 1889, at a valuation of 96,000*l.* and a payment of 10,000*l.* to the London County Council in lieu of the reservation of any portion of the land as a recreation ground, for the Parcels and Telegraph Engineering Works services of the Post Office. In June last year the Provincial Mails service migrated from St. Martin's-le-Grand to the premises erected there, at a

cost of about 113,000*l.*, by Messrs. Lorden of Upper Tooting, contractors.

ADVERTING to the obituary notice in our last issue, pp. 142-3 ante, of the late Mr. John Murray Robertson, of Dundee, we may mention that in our number of August 13, 1898, "Dundee," being No. XVII. of our series, "The Architecture of our Large Provincial Towns," we published illustrations of the Fyffe's Buildings in the Nethergate, the Lochiee Free Library and Baths, the Caledonian Insurance Company's offices, and the Technical Institute—all erected after his plans and designs.

The usual series of lectures at Carpenters' Hall will commence on Thursday evening the 21st inst., with a lecture by Mr. H. H. Statham on the architecture of the recent Paris Exhibition, illustrated by lantern views of a number of the buildings, permanent and temporary. The lecture is not intended to be merely descriptive, but for the critical consideration of some points suggested by the treatment of the Exhibition buildings. The succeeding lectures will be by Mr. H. C. Richards, on "Old London" (February 28); by Mr. John Slater, on "Celebrated Ancient Buildings" (March 7); by Mr. W. E. Riley, on "Dwellings for the Working Classes" (March 14); and by Professor T. Roger Smith, on "Westminster Abbey" (March 21). The lectures commence at eight o'clock.

The receiving days for works sent in for exhibition at the Royal Academy this year are:—
 Royal Academy Exhibition.
 water-colours, miniatures, black-and-white drawings, engravings, etchings, architectural drawings, and all other works under glass, Friday, March 29; for oil-paintings, Saturday, March 30, and Monday, April 1; or sculpture, Tuesday, April 2. We may remind our readers that architectural drawings must all be sent in gilt frames; any other frames are not admissible.

PORTSMOUTH TECHNICAL INSTITUTE AND LIBRARY.

The designs submitted in competition for the proposed Technical Institute and Free Library have been on view at Portsmouth Town Hall this week. The competition was limited to architects practising in the town, and involved an estimated expenditure of 43,000*l.* Six sets were received; we have already published the names, together with the award of the premiums (see "Competitions" in our issue of January 10).
 The circumstances of the contest are somewhat unusual, and considerably to the advantage of the architects, as the Corporation engaged the services of Mr. A. W. S. Cross to act as the assessor, and he prepared sketch plans, outlines which were furnished to the competitors. This was no doubt a wise course to adopt, as otherwise probably it might have been difficult to have locally obtained a satisfactory plan. The competitors were directed generally to follow the lines of the plans as laid down, it being open to them to make what minor modifications might commend themselves.

All six designs are therefore practically identical, no one competitor caring to launch out. This is somewhat remarkable in regard to one special feature—the entrance; no design attempts to make this an element in the plan, and coming at the angle of the site it is of considerable importance.
 The site is a fine one, situated west of the town Hall, and now occupied as an ornamental garden; it is bounded on one side by a railway embankment, and on the other by

Park-road, to which latter it has a frontage of 180 ft., and of 160 ft. to the Town Hall, forming an *^-* shape, with the entrance at the angle.

The general disposition of the plans is as follows:—Entering from Park-road at the corner, the building is bisected by a corridor both ways, the staircase being opposite. In the right wing is located the free library—reference library, store and engineering-room being in the basement. The first and second floors provide an examination-room, which is also available for banquets in connexion with the Town Hall, and an elementary art room. The left wing contains in the basement the building-construction and engine rooms, &c. The ground floor has a range of ten classrooms and other offices on either side of the corridor, which is lit from the end, and is about 150 ft. long by 8 ft. wide, with caretaker's-room in a wing at end. The first and second floors have in front the physical laboratories, lecture-rooms, &c., while the art rooms are situated at the back, which has a good north light. Two lecture theatres come over the entrance, while cart access is provided at the rear.

This is the plan which all of the competitors have adopted, with but slight modification, and no one has grappled with the dislocation of the sanitary adjuncts, which are all within the building, or the architectural treatment of plan of the entrance.

The problem, therefore, submitted was tempting, and comparatively easy of solution in having merely to modify the plan and clothe it architecturally, and that the result has not been more satisfactory is a matter for some surprise, as no design submitted shows any high and unquestionable merit.

The first premium has been awarded to Mr. G. E. Smith, who follows the sketch plans; but the details are not wholly free from defects, the supervision of the library being imperfect, and the entrance doors, which are at the head of a long flight of steps, are inadequate. On either side are two great bay-windows partially treated as sash frames, the upper half being lead lights; angle turrets abound, which are utilised as recesses. A tower encloses the staircase at the rear, but would not be seen, at all events, from the point of view indicated. In regard to details the scheme may be a good deal improved. The elevations are brick and stone banded, with many breaks, projections, and turrets, and the fronts to the streets suffer greatly from a profusion of irritating ornament. For economy's sake this has been omitted on the back elevations, very greatly to their advantage. The design is illustrated by an admirable perspective, which gives a pleasing interpretation of the design, but will not bear investigation.

Messrs. Rake & Cogswell are awarded the second premium; this is a more spirited, though evidently hurried, design. The entrance is by a circular porch. The wall above is carried up and finished with a curved pediment, the angle being filled with splayed piers, with cappings; these not running into the pediments having an inconclusive effect. A lofty turret is carried up on either side, projecting at the top and much overweighted. It is clear from the plan that these features are impracticable, as a 14-in. iron column is being carried up on either side to produce them over the lecture theatres. The fenestration is deficient, the windows being ranged in a diminishing scale, which makes the laboratories on the top floor very dark. The examination-room is more effectively treated than in the first design, in view of its municipal use. The spacing of the façades is well considered, and the stonework agreeably grouped, with a pediment at either end, with the intermediate spaces divided by pilasters, makes up the two fronts. Parts of the plan are dark, such as the lavatories and the students' locker-room. The arrangement of the library is, however, good. The design is effectively shown by a pen-and-ink perspective sketch.

Mr. W. C. Bevis, who is awarded the third premium, has some good points in his plan, and the arrangement of the library is certainly the best submitted—the book stores being kept at the rear, and all well lighted, with the news and magazine spaces in front, all under visual control. The entrance hall in the plan has received some slight recognition, two alcoves being formed, one of which affords convenient access to the basement. The treatment of the angles is the especially weak point in the design, an error which is apparent in all the designs to a certain extent excepting the first, in cutting the building into two. In this instance, a portico and two segments, surmount-

ed by a stone balcony and turret, attempt to fill the space of the angles, but do much to mark the distinction the more. The building is seen to better advantage in the scale drawings than in the view. The elevations in this have been extended in every instance but one, without any real gain. The theatres are well-planned, and careful attention has been given to the fenestration.

Mr. C. W. Ball has his design evidently illustrated by the same artist as in that placed first, and it is noticeable that the perspective and elevations do not correspond as they should. Judged by the former, it is generally one of the best designs. The frontage to Park-road is, not unreasonably, treated in a different phase, being divided by a pediment treatment at the far end, and the intervening space by two curved pediments, the resultant being a crowded effect. The Town Hall front is quiet and satisfactory, and with a feeling of repose which but few have sought after; but the contrast between the two calls for some elimination on the Park-road elevation. The entrance is treated on a plane, within a curved pediment and porch, the fenestration over is not happy, the whole completed by an octagon and dome; but it requires more connexion to be entirely satisfactory. The library seems to be divided by solid partitions, which would not be desirable, and the lighting generally would require re-consideration.

Mr. A. E. Guy's design is the most pretentious of any. The chief point about the plan seems to be the complete system of heating and ventilation. The lecture theatres are on the reverse plan to the others shown, the lecturer being placed back to the light. The elevations and perspective do not call for remark, being of a nondescript character.

Mr. J. Walmisley submits a carefully-prepared set, and a good line perspective. The building looks suitable for its purpose, and has gables with stone tops of a rather commonplace type now in vogue. The porch on the Town Hall side is brought up to the path, contravening the instructions. The Park-road front has been kept at a higher level, and the whole effect as one building is satisfactory, although the windows have a wiry look.

We have before called attention to the question of perspectives in competitions; there is something to be said for them at times. They do not, however, influence an assessor's choice; but this is one of those rare instances where architects of good local repute might have been asked to submit perspectives without elevations, for more often than not the one or the other is delusive.

COMPETITIONS.

CARDIFF NEW ASYLUM.—The award in the competition for designs for a new asylum which the Cardiff Corporation have decided to build on the Velindre Estate, near Whitchurch, was made on Thursday last week, when Mr. George T. Hine, the assessor, placed first the designs of Messrs. George H. Oatley and W. S. Skinner, of Edinburgh Chambers, Bristol. Fifty-four architects had submitted plans, and five had been selected for the final decision. They were Messrs. Oatley and Skinner, Bristol; Messrs. Law and Allen, Arundel-st., London; Messrs. Greenaway & Newbury, Queen Anne's-gate, London; Messrs. Hooley & Sander, Nottingham; and Messrs. Wills & Anderson, Swansea. Messrs. Oatley & Skinner were appointed the architects to carry out the work at a commission of 5 per cent. on the contract. Their estimate is that the work will cost 235,000*l.* Each of the remaining four competitors named will receive a premium of 100 guineas. The accommodation is for 1,250, but it is proposed to open wards for 800 patients only at first. Mr. Hine announced that all the five named competitors had complied with the conditions, and that the standard was high.

UNION HOSPITAL, PATRICKCROFT, LANCASHIRE.—On the 6th inst. the new union hospital at Patrickcroft, erected by the Barton Board of Guardians, and situate adjacent to the new workhouse, was opened. The buildings were erected as a memorial of the Queen's Jubilee. The plans were prepared by Messrs. Worthington & Sons, architects, Manchester, and provision is made in the male and female wards for 200 beds. The contract for carrying out the work was entrusted to Messrs. Gerrard & Sons, builders, Swinton, and the cost has been considerably under 20,000*l.*

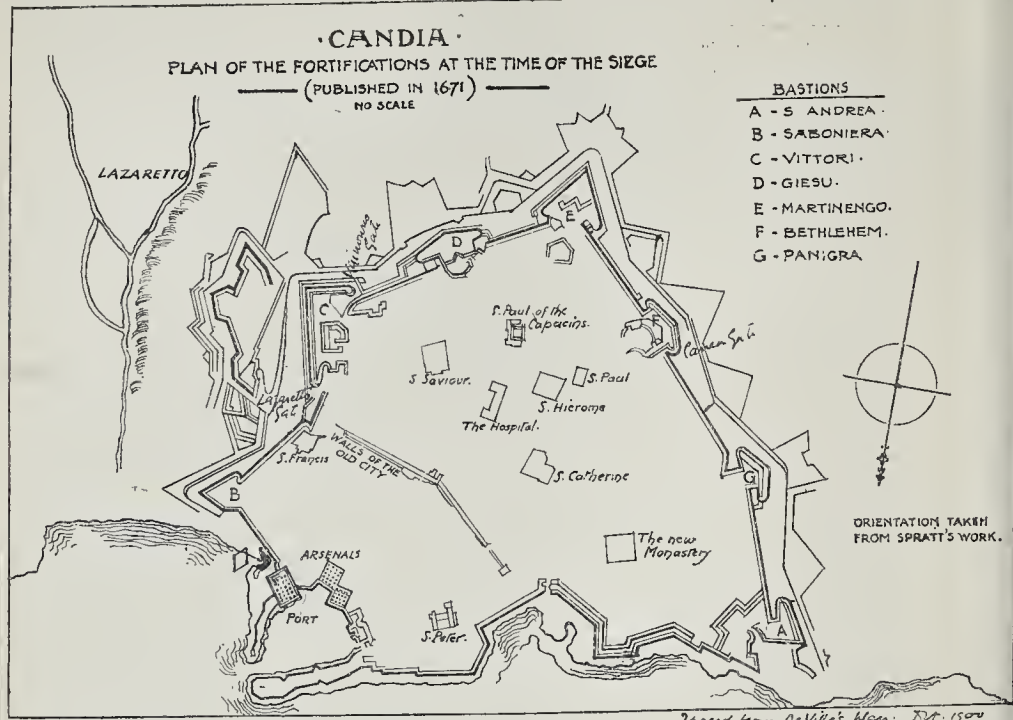


Fig. 1.

Drawn from De Ville's Plan. B.M. 1500

THE ARCHITECTURAL ASSOCIATION.

AN Ordinary Fortnightly Meeting of this Association, deferred from the 8th instant on account of the Queen's death, was held on Friday evening last week in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, the President, Mr. W. H. Seth-Smith, occupying the chair.

The late Queen Victoria.

The minutes of the previous meeting having been read and confirmed, the President said: "I think it will be in accordance with the wishes of all of you that the Architectural Association, at its First General Meeting after the death of the late Queen Victoria, should pass a vote of condolence with the King and with the Royal Family (the members of the Association here all rose from their seats and remained standing until the President's motion was agreed to). The Architectural Association cannot boast of Royal Patronage. Your committee, therefore, felt it might savour of presumption to send a tribute to the Queen's memory in a form such as that which it became the Royal Institute of British Architects to offer. The members will, however, I am sure, feel that this occasion must not pass without a public record of the profound sense of loss we, as a public society, in common with every one of our fellow subjects, have sustained by the death of Queen Victoria. Every man must acknowledge himself the poorer and at the same time the richer. We have lost a Mother in the highest sense; but has she not bequeathed us a fortune and a great one for all who recognise that man does not live by bread alone? That life, early consecrated by resolute will to the service of its author and its fellow men, has realized the ideal of religion and of ethics, and of public, domestic, and social duty. The throne of the greatest Empire the world has yet seen is a point towards which the eyes of all men are naturally directed, and when that exalted position is occupied by a life lived on a plane altogether higher—intellectually, morally, and spiritually—than that which mankind is accustomed to witness, it must wield an incalculable influence for the progress of the race. It is this which makes Queen Victoria's life so rich

a gift to mankind, so great an inheritance to the British Empire. A gift, which if made good use of as an ideal of womanly character to our men and as a pattern to our womanhood, cannot fail to make us true to our vast responsibilities as the teachers and rulers of so large a proportion of mankind. The King has, we consider, during his many years of gracious and generous devotion to the interests of the public, shown a desire to encourage art by every means within his power, and we welcome in him one whom we may surely hope will help to give architecture the place in the public estimation which its greatness merits, and who will in particular use his royal influence to further the better training and organisation of the profession. I will, therefore, move that the following respectful address of condolence be forwarded to His Most Gracious Majesty the King—

"May it please Your Majesty,

We, the President, Committee, and Members of the London Architectural Association at our first General Meeting since the lamented death of Your August Mother beg leave very humbly to offer to Your Majesty and to the Members of Your Family our profound sympathy and sincere condolences on the irreparable loss which you and Your Empire have sustained by the death of Your August Mother, the late beloved Queen.

At the same time we would venture to hope that Your Majesty will be graciously pleased to accept a dutiful assurance of our devotion and affectionate loyalty, both to Your Majesty's throne and person and to the Members of Your Royal House."

The address was signed by Mr. W. Howard Seth-Smith, the President, and the Members of the Committee.

The motion having been agreed to, the Chairman said that owing to an engagement made before the date of that meeting had been changed from the 8th to the 15th inst., he would not be able to remain for the rest of the evening; and he would call on the senior Vice-President, Mr. W. A. Pite, to preside.

Mr. W. A. Pite then took the chair, and the following gentlemen were elected members of the Association, viz.—Messrs. A. F. Benjamin, W. J. Brough, B. A. Everitt, A. H. Fleuss, A. P. Lambert, and E. E. Temple. It was also announced that Mr. T. Davison has been reinstated a member.

A vote of thanks was accorded to Messrs. G. Bell & Sons, the publishers of Mr. J. Blomfield's book entitled "A Short History of Renaissance Architecture in England," for presenting a copy of the work to the library.

It was announced that the first spring visit will be made on the 16th inst. to the Roman Catholic Cathedral and Cardinal's House Ashley-gardens, Victoria-street, Westminster by permission of the architect, Mr. J. Bentley.

Architecture in Crete and Turkey.

The Chairman then called on Mr. D. T. Fyfe to read a paper on "Architecture in Crete and Turkey," remarking that Mr. Fyfe was well known to most of them as a former Architectural Association travelling student, who has since had the honour of being sent out to Crete to take part in the recent excavations there.

Mr. Fyfe then read the following paper—"Like all Greek lands, Crete belongs to the dawn of history, and is rich in remains of the Mycenaean civilisation, about which so little is known. This period, however, belongs more to the domain of archaeology than of architecture, as also, in the case of Crete, do the Greek and Roman periods; their remains being so scanty as to afford little architectural interest. After the decline of the Roman period the island was conquered by the Saracens in A.D. 820; then by the Byzantines in 961; but to Venice belongs the chief mediæval period which lasted from 1204 till the final conquest by the Turks in 1669. The island in its most representative aspects is Venetian. Under the Turks how rebellion followed rebellion in a matter of well-known history.

It is certain that Crete held an important place in the Early Ægean civilisation. Homer mentions it as a land of ninety cities, from which we can infer that it was highly populated. The sites of many of the Homeric cities have been identified, and are now partially disclosed, notably, Knossos, Gortyna, and Ghoulas. In their construction we notice the same characteristics which are displayed in the Palaces of Mycenæ and Mycena, in the mainland of Greece, excavated by Schliemann and Dr. Dörpfeld, &c. In all are the same mud (or rubble and mud) walls, mysteriously

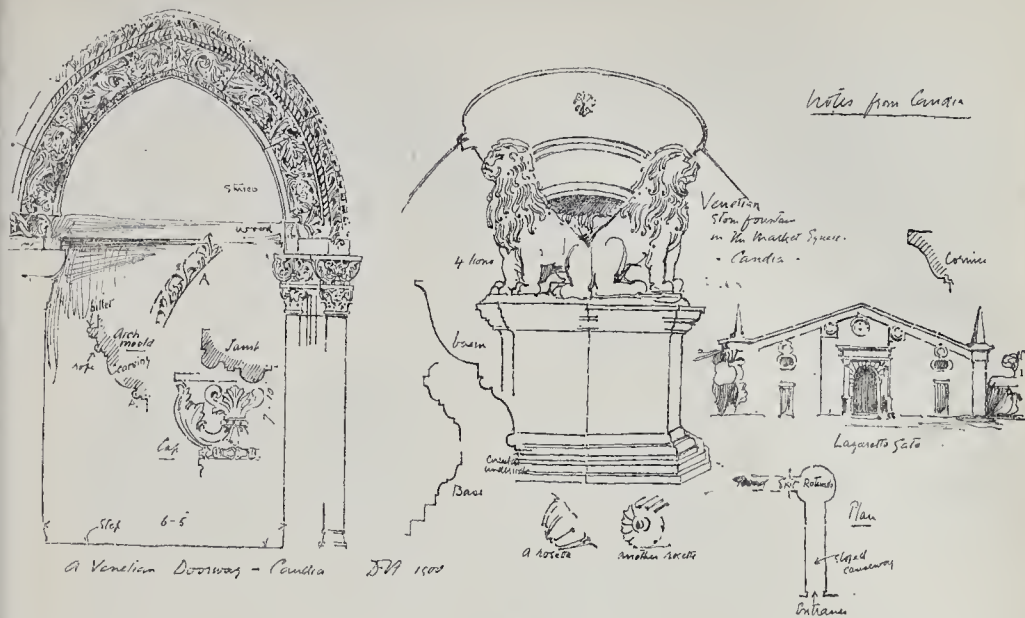


Fig. 2.—Sketches at Candia.

appearing to be contemporary with Cyclopean masonry; the same circular stone column-bases and paved areas. Only Knossos has produced some entirely new forms of architectural plan and detail, and such a collection of painted stucco, both existing on the walls and in fragments, as to make it quite unique in the Levant. Looking at this stucco as a means of decoration, it is noticeable that two distinct scales seem to have been employed; one, comparatively easy to appreciate now, consisting of life-size representations of figures, bulls, gryphons, &c., or conventional representations of landscape; the other consisting of very small objects or figures produced in a more brilliant style, and found in such small fragments as to make it hard to understand how it could have been used. From this latter variety some very interesting architectural representations are apparent, which help to elucidate the subject of Mycenaean building. The art displayed at Knossos is the complete fruition of the genius of the time. Though some of the finds at Vaphio, in Greece, are quite as artistically mature, a comparison of Knossos with either Vaphio or Mycenaean is futile at present, as so much of the treasure of the latter comes from the tombs, which in the Cretan site have not as yet been discovered. But in the palace itself enough has already been found to show that in this reputed home of the art of Daedalus, a very keen, strong perception of natural forms existed, and a direct getting at nature behind an indefinable veil of conventionality, which gives the art of this epoch a distinct value of its own. In building, the outer walls, which may have been more or less fortifications, are based on ponderous squared blocks of gypsum, which weathers with water grooves, like the hard calcareous substance of a cave. The bases of many walls in limestone and gypsum have been found very accurately levelled and laid out, but it still remains a problem in many cases whether the superstructure was of the same substantial material or of mud to take stucco work. Nothing of direct evidence has been found to point to the existence of later Greek or Roman settlements over this primitive one of the palace at Knossos, though many Roman fragments exist in the vicinity. The site of Ghoulas is an Acropolis much more approaching the wild and inaccessible character of Mycenaean than the refined and civilised Knossos. Splendid polygonal masonry exists here, forming ramparts up a steep hillside which overlooks a truly Greek prospect of hill and plain. And here also are picturesque evidences of a later Roman settlement on the Acropolis itself. But Crete has no prominent Roman

architectural remains above ground that would bear comparison with those of Italy, Greece, and Asia Minor, and be of much help to the student in his search for the historic links which bind the Imperial Art to the Romanesque and Renaissance of later times.

Coming to more modern times we notice also that Crete has passed through so many vicissitudes, and fire and sword have wrought in it such havoc, that its present day can show but little of permanent architectural value above ground. Whatever it was in early times, both under the Venetians and the Turks, it formed but an outpost-station, very liable to attack; so it is not surprising if the engineering of walls, and the useful side of architecture generally, form a large part of what is to be seen in the island to-day. Owing to the fusion of periods of the dominant mediæval power and the later conquering Islam, Candia, the most important historical town and the capital of the island, presents in its picturesque aspect an Eastern town with white walls and minarets, combined with massive sea-walls and fortifications. One can sail close in round the harbour in a small boat, and see as a sign the lion of St. Mark high up in frowning walls, and afterwards, on landing and traversing the market, be bewildered by all the strangeness of an Eastern town. This is true, of course, all over the Levant. The conquering Turk was an interloper and a barbarian, who settled down amidst the cultured evidences of mediæval times; and so from Constantinople, downwards in the scale, one finds the same thing—the dome, minaret, and whitewash of the Turk side by side with the grey stonework of the conquered Christian races.

The more modern architectural remains of Crete include:—1. Churches and monasteries in a pseudo-Byzantine style, similar to those met with in the country districts of Greece. 2. Buildings of the early Venetian period, in which the pointed arch was employed. 3. Later Venetian buildings in a provincial Renaissance style. 4. Turkish buildings, which are mainly domestic, and in plain stucco. The town of Candia contains examples of all of these, except the first, though it has also been sadly deprived of much that was apparently interesting of the Venetian period. I shall give some description of Candia, and then indicate what I saw of other work. The great defence of Crete against the Turks in the seventeenth century was a matter of such interest to the Christian Powers of Europe, that we fortunately possess some literature on the subject, and contemporary plans of the fortifications of Candia, the siege of which lasted for more than two years, and became

one of the most memorable in history. I have here a plan of that time made by a French Admiral, the Marquis de Ville, who commanded a relief expedition. This plan will serve to show to the curious the nature and extent of the original fortifications (fig. 1). Many of these, especially on the north side, exist to the present day in a good state of preservation; and some of the photographs I have will indicate their character. It will be seen from the plans, that the nature of the harbour has been taken advantage of much in the same way as at Rhodes; and the fortifications of the two towns resemble one another, both being more irregular than those of Nicosia in Cyprus, a plan of which was published in the *Builder* recently. The Candia walls are good examples of their class, but they have no prominent towers and no decorative details of interest, except the occasional panels with the Lion of St. Mark before alluded to, and a few small carved coats of arms. So they are probably inferior in general interest to those at Famagusta, in Cyprus, and those at Rhodes. There are three principal gates in existence, all Renaissance of the Venetian period: the Canea Gate, the *Kainourio*, or 'New' Gate, and the Lazaretto Gate (see lithograph). This last is probably the most interesting of the three, and has a long vaulted passage from the ornamental inner gate to the outer entrance. This passage is barrel-vaulted in rubble and descends pretty rapidly towards the outside. It turns sharply to the left at the end, so that there is an intersection, over which is a dome lit with a single eye; thus when the outer gate was shut the passage would not be in darkness. The form of the inner gate, with its pediment, is quaint; but the details are coarse and in no way improved by much whitewashing. The part of the wall at this gate was perhaps the most impregnable, as it commanded a very deep moat, owing to the rapid slope of the ground towards the sea. The level square of the town inside the gate (shown in the lithograph) is raised artificially, and a few steps ascend to a platform which juts out beyond the main line of wall, being built upon a forework which originally protected the bastion here. The raised plateau is now the Public Garden, and commands a fine, though limited, view seawards and a good sight of the walls. To return to the other gates. The *Kainourio* is more commonplace than the Lazaretto, but is of naked stone, and has a good quiet cornice. It forms the entrance to the town from the interior of the island, and the present roadway really crosses what was the moat of mediæval times. It has also a

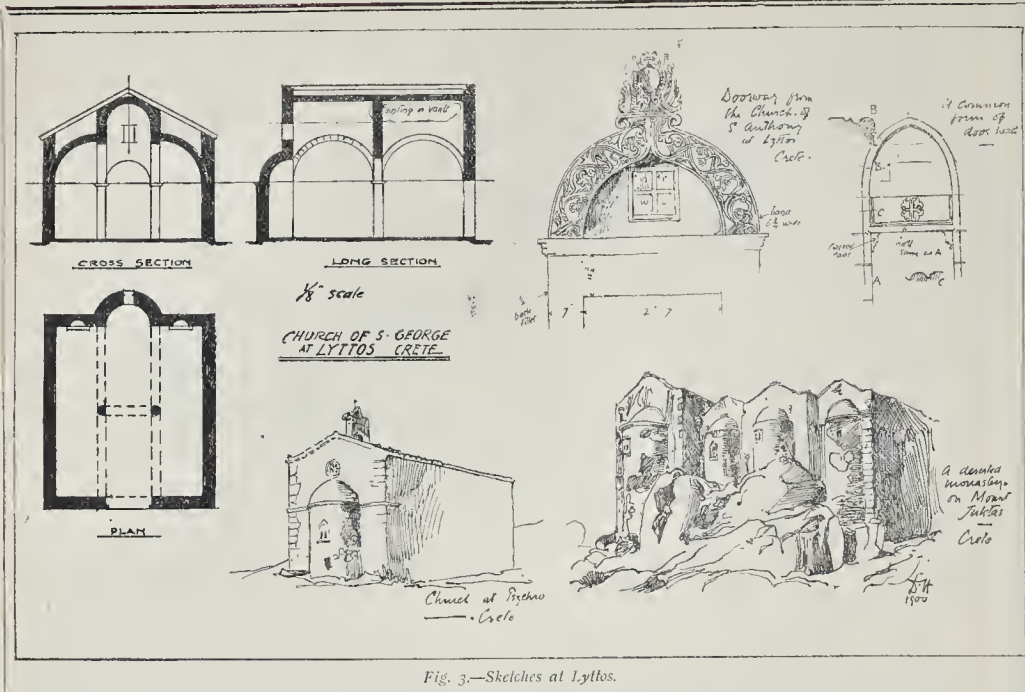


Fig. 3.—Sketches at Lyttos.

long vaulted passage from inner to outer gate, though not so remarkable as the other.

The Canea Gate has even less of architectural interest than the other two, and I do not possess any illustration of it. It has no vaulted passage, being merely in the thickness of the wall, and it leads to the high road that runs eastwards along the north shore of the island, towards Reimo and Canea.

Leaving the walls and gates now, and entering the town by the harbour, we see first the remains of the great arches of Venetian Gothic which formed the arsenals of the mediæval town. They are marked thus on the old plan, and were, no doubt, complete before the great siege. Now, in their ruined state they are used as boat-slips. The responds which exist on the back wall show that there must have been ribbed and groined vaults here, and the piers that exist are massive enough to show the large scale of the whole. Leaving the harbour, we pass up a sloping street to the centre of interest—the market square—at the highest part of the town. Streets radiate in all directions, but the interest here is diffused, and the square is only a quiet aside. The throng of the markets is at another meeting of streets a few yards from it, surrounded by low, squalid buildings, with here and there a crazy, whitewashed dome. The market square, however, has a fine old Venetian fountain in the centre, surrounded by a Turkish marble and wrought-iron grille (see lithograph); and from this point can be seen, partly hidden by a large plane tree, the only large building in the town of any character—the old Venetian Renaissance armoury (see lithograph), now proposed to be renovated and used as a museum of antiquities. This building is a very good example of its period, and exhibits, as do other little things in Candia, many of those quaint provincialisms which so often delight the careful eye in architectural by-paths. The proportions and details are alike good, and admirably in scale with the general air of the town. A crowning balustrade is rather wanting somehow, though its addition might take away from the Venetian character of the building. White stone is the material used, but the lower story has been whitewashed—a favourite trick of the Turk everywhere. The smallness of the rustication is noticeable. At the rear of the building, otherwise plainer than the front, are some quaint metopes in the Doric frieze, representations of weapons, &c., carved with great boldness. The other Renaissance work in the town is fragmentary, but the Turks largely adopted details of the late Venetian occupation, which causes some con-

fusion. The Gothic work in the town, or rather the 'pointed arch' work, is in some cases even more difficult to analyse, as the Turks are always at home with the pointed arch, so that the Venetian Gothic and the Turkish work are not always readily distinguishable. Both of them have probably a Saracenic origin. Venetian Gothic is certainly quite a unique flower in architecture, and perhaps belongs properly to the East, as the Turkish work undeniably does. There are one or two charming fragments of Venetian Gothic in the town, enough to show what might have been under a more fortunate dispensation. The doorway, of which I have a sketch, is a good example (fig. 2). The capitals at the impost show Byzantine and Classic influence, and are beautifully detailed. The sturdy stone fountain of lions in the market square (fig. 2) is quite a treasure, with large and generous treatment of basins and mouldings. The Turkish grille surrounding it, though it rather hides the older and better work, gives it additional dignity. The form of the grille is probably governed by the old carved marble panels of Roman or Byzantine time which are built in at the base. In the new upper part a light grey marble is used for the framework, sparingly decorated with gilding and green paint. Here should be mentioned the only Gothic church in the town which is still standing. It is now used as a mosque, but is evidently the building marked as St. Saviour's in De Ville's plan. It has no pretensions whatever, being merely a barn-like structure, with high, narrow, pointed windows, all perfectly plain. It has a stumpy Turkish minaret of pleasantly original design. This mosque is illustrated in Pashley's 'Travels in Crete.' I have, unfortunately, no illustration of the wall fountain in the little square beside this mosque, which is the only example I know in Candia of Roman work being built into a wall by later hands, and which is so commonly seen and often so charmingly effective in Rome and Constantinople. The Candia fountain has merely a quaintness caused by broken-nosed statues and battered columns, associated with some common-sense mouldings. Of Turkish work one of the best old fragments is the series of arches in the main street leading up from the harbour. It much resembles the boat-slips at the harbour, but has one or two tricks of Turkish detail (see lithograph). The Turkish fountains are mostly at the corners of the streets, and, generally speaking, are hardly worth taking note of; but in one or two cases the simplicity of the mouldings deserves attention. Turkish work, when it redoubles

on itself without other influences, has a tendency to over-elaboration, and most of the great show fountains of Constantinople are glorified grottoes in their total effect; so that it is refreshing to come across some things in this little provincial town which, either from poverty of workmanship or uncertainty of style, are simpler and broader in treatment. The little corner kiosk illustrates the better class of Turkish bijou in Candia, and though it is small, has some claims, if one can get behind the oceans of abuse and whitewash. The centre spot in the lower panels is a favourite form, and is met with all over Turkish work. In the narrow winding streets one sees Turkish wooden houses with latticed windows, usually with a good projecting cornice and pilasters, and the upper story projected two or three feet and supported on wood brackets. In the high walls giving access to the forecourts of the stone houses one sees here and there a Renaissance door and window, with occasionally a wall fountain, a trough surmounted by a round-arched niche and accessories being the usual motive. None of these call for any particular remark. The wood houses are pretty much the same as those in the streets of Stamboul, and remind one a little of English half-timbered work, gables of course being absent, and a thin, matchboard effect taking the place of the solid oak of the English. I have reserved the mention of the earliest work of all, the Byzantine, till the last; but there is really no definite building in that style that I am aware of existing in Candia. Pashley mentions nothing in his book, and the only thing which Spratt mentions which I have not identified is (I quote his own words) 'the ruined church of St. Titus, over the eastern part of the fortifications; for such a town, of cathedral proportions and architecture. A handsome entrance and circular window over, and part of an elegant baptistry attached to it, are still standing.' It may have been an oversight on my part, but I certainly know nothing of such a church, which may, of course, have been destroyed since Spratt's time (1865). The church also may not have been Byzantine. This takes us pretty well over the ground for Candia. In general impression it is a hopeless mixture of the odds and ends of various periods. There is not a recent building of any note whatever, except perhaps the Greek cathedral, and not a single mosque which is worth enlarging on. The best mosque in the town is the plain old building mentioned before as the only Gothic church existing; but here, beyond a picturesque, weather-beaten, brick-and-stucco wall, there is

nothing to be noted. The modern Greek cathedral (shown in the sketch in combination with the minaret of the new mosque) is best seen at a distance, and gives additional life to the sea-view of the town. One can pretty well take in the town after a walk through, and appreciate what it is—tawdry, neglected, mediæval Eastern—shortly to become more important, perhaps, through a museum which consists of valuable exhibits with no proper building to hold them; which is part of the fact that many people have ideas about reform in Crete, but as yet very little money or unanimity of opinion have been forthcoming to carry them out.

But, leaving Candia and the burden of Crete meanwhile, let us turn our attention to other parts of the island, and see what is to be found in the way of architecture. And if the result is disappointing, we can remember that archaeologically, at least, the ancient evidences are of immense value. The results of Knossos, Praesos, Gortyna, Ghoulas, &c., and the sundry caves of Zeus are giving Crete a research interest quite exceeding expectations. Architecturally, however, it has no town with a strong mediæval interest, like Rhodes, and no body of work such as is disclosed to us in M. Enlart's new book on Cyprus. The results for Crete are in comparison meagre and fragmentary; here and there a small Byzantine church or a picturesque monastery, and for the rest, merely the plain domestic work met with in the country districts of any Eastern land. It is true that there are two other towns of importance on the north coast—Canea and Retimo—Canea being really the modern capital of the island; and I have not examined these towns as I have Candia, but anything really important would naturally be found at the latter place. The growth of Canea is due to the adjacent harbour of Suda, by far the best in Crete, and its prestige is only on the modern side. It is the residential town of the High Commissioner, and, like Retimo, a commercial centre. It would be necessary, therefore, to thoroughly explore the country districts to arrive at a complete knowledge of all the smaller Cretan work. As the architectural bits are so fragmentary, and native evidence so little to be depended on, this would mean a tour of several months' duration. The Italians are said to be working up the architecture of Crete now, but I am not certain how thoroughly for the country districts. I was only able to make a tour of about 100 miles through fairly representative country, but was unable to appreciate pretty well what can be looked for from the island. I could not do better, I daresay, than illustrate by examples the Cretan house, church, and monastery.

The houses of the Turkish beys are the only ones left to us of any importance. They are usually farm-steadings in themselves, but the houses of retainers are sometimes grouped in their village near. I can briefly illustrate the latter class of house by the one I have most acquaintance with—the headquarters of the Cavation at Knossos—of which I have a sketch (see lithograph). The front entrance is like a private one, and leads to the little piazza served for the household. The real entrance is at the back, through a courtyard, and leading out of this yard round which are grouped e stables, is a smaller one descending to the kitchen apartments and entrance to the harem. The *scamliik* looks out to the front, as do the other principal rooms. All have stone wall-utains, which cool the air in summer, and a divan, or at least a platform, round three sides. Glass is a luxury, but hinged wood-utters opening outwards are indispensable. In the house I am describing, there are loopholes in the walls, presumably for defence, lined on to the house, besides the little piazza in front, is a large water tank, forming a reservoir for the irrigation of the garden. This tank is not conducive to health in summer. The house is all whitewashed externally, and is very sensibly plain, with a square parapet to the flat mud or cement roof, so that rain water is carried off by channels running down the wall, which in the front of the house are screened by plasters. The ceilings are of wood; stout exposed rafters trying boarding. In the back entrance-lobby an olive press in the wall for the use of the household. As for the villages, the small out-of-the-way ones have the merest shanties, with high stone whitewashed walls and flat mud roofs, huddled together in picturesque style. The hill-villages in summer are pleasant, as a half lives on the roof. The larger villages

have whitewashed houses, the more important ones with courtyards opening off the streets, and sometimes of two stories, as in Candia. Red tiled gabled roofs are also occasionally met with, though they are really modern features.

The next thing to consider is the Byzantine church. This is often in splendid isolation, sometimes on a hill-top, and occasionally even on mountain summits. But every village has its *εσθια*; at feasts, such as Easter, a very important place indeed. The universal plan is an oblong hall, without a narthex, and with but one feature—the tiny apsidal projection at the east end, finishing semi-dome fashion. In this apse is the only fancy window; in common cases, usually a queer little two-light, with the luxury of a hood-mould. The better class of church has a carved door, or painting in the plastered vault. Notes from the two churches beside the ancient site of Lyttos will illustrate. The rough plan and section of the church of St. George illustrates an average arrangement (fig. 3). There are traces of rude painting in the vault of this church. A very common type of door-head is shown. The wood doors of these churches are sometimes elaborately carved. The usual type is a two-leaved square door, with a rounded centre-post, on which most of the carving is lavished. Many of these wood carvings are so undoubtedly executed in the full tradition of good work, that it is astonishing to find they mostly belong to this century; in some cases being done within the last thirty years. So tradition is dying hard in Crete. It is quite possible that these churches at Lyttos, not specially celebrated in the island, may point to some fairly interesting bit-bits of Byzantine work, fairly, perhaps, one or two new developments of plan in other parts of the island. But there are no outstanding churches of any size, and I doubt if results would go beyond the student's notebook. I have the names of three or four other churches in the island which are said to be interesting.

Following naturally from this, of course, is the subject of the monasteries, as they always have chapels attached. The situation of monasteries here, as elsewhere in the Levant, is often very delightful. One rides up a ringing stony pathway to a sense of summit and retirement, and a clean spacious comfort which is a relief to the wayfarer after the squalid village. They are usually more subjects for the sketcher than the architect in his more practical moods, but the monastery at



Fig. 4.—Monastery at Arkadhi. (Traced from a Photograph by Mr. F. B. Welch.)

Arkadhi (fig. 4) shows a front of considerable interest, with that quaintness of combined Gothic-Classical influence so instructive often in unacknowledged forms. In this way it appears to be even more interesting than the armoury at Candia, though I regret that I have not been able to verify the detail from actual observation.

Unfortunately, I have reason to believe that this is one of the only things of its kind in Crete. The country is not rich in monastery work. Pashley mentions a monastery at Triadha, and gives rough sketch, which appears picturesque enough. The pen-sketch of a deserted monastery on Mount Iuktas shows how the average of these buildings tell by their grouping, but have no particular architectural qualities, strictly speaking.

The second part of this paper, dealing with some Turkish work at Broussa, follows somewhat naturally from the first; as after an examination of the mosques at Constantinople, one feels, as in Crete, the readiness of the Turk to adopt the indigenous architectural forms in the territories of his conquests. The work of the Osmanlis at Broussa, however, is earlier and more representative than any found at Constantinople, and holds an isolated position in Turkish art, somewhat similar to the *Cinque-Cento* in the history of the Italian Renaissance. The intricacy in the developments of Eastern work is manifold, but in the vast web of Saracenic styles the growth of what might be called the Renaissance of Turkish architecture is at least clear and distinct. The beginnings are to be found in Asia Minor, in those large and suggestive and often very beautiful remains of the Seljouk domination. It may be said that this pointed work of the Seljouks bear most affinity to Persian work, on which, as far as I know, it was directly founded. The work about which I wish to speak begins with the era of the Broussa Sultans, when Mourad, Bayezid, and Mohammed—all first of the name—built the chief mosques of Broussa. Founded, as it was, on what the Seljouks had done before, this work seems to have, in addition, some large and common-sense individualities. The typical two-dome plan, which Texier observes is not found at Constantinople at all, is best seen here in the Mosque of Mourad II., the Mosque of Bayezid I., and the Green Mosque, or Mosque of Mohammed I. It is of this last, and of its *Turbek* adjoining, that I wish specially to speak (see lithograph).

The two-dome plan, in its completeness, has an open porch, or loggia, of the whole width of the entrance front; and this feature can be seen in the Bayezid and Mourad Mosques. The Green Mosque, however, was left incomplete, and the porch was never added. It would be interesting to know whether the great canopy of the entrail doorway (see lithograph) belongs to the original period, or was added later. The mosque was built in 1420, and one hardly looks for such big, say *Michelangelesque*, detail in Anatolia at that time. In exterior disposition the mosque is, uniformly, of two stories, finished with a cope, over which is a low-pitched roof. At the entrance end are two minarets, originally covered with green *faience*, and evidently reconstructed since the earthquake of 1855. The exterior, generally, is all marble surface, and has exquisite carving at the doorway, windows, and niches. The doorway is a particularly fine piece of design, both in proportion and detail. The plan (fig. 5), in essentials, I can answer for as being reasonably correct, though there is no scale. As yet, I have seen no publication of the plan of this mosque. Recollect, in this connexion, the caution that is necessary in Turkey when taking notes on a casual visit, and do not judge hardly of these meagre sketches. The thought displayed in this building is its essential quality, and this one may realise without elaborate means. The adjoining *Turbek*, or tomb of the founder (see lithograph), is one of the most delicious creations imaginable. The lower part of the exterior is of white stone, with large panels of bright blue-green tiles. The upper part is painted light green, and it is finished with a domical lead roof. It is of large scale, as can be seen from the figures in the photo of the entrance. The sketches exhibited were from memory, and, as in the case of the mosque, have no scale. The following notes concerning both these buildings were taken on the spot. Beginning with the *Turbek* first, 'Outside, the mouldings are large and simple, and the size allows for great breadth of scale. There are ornamented tiles over some of the lower windows, and panels of same above these. The doorway is a fine piece of colour, painted, not tiled, and over the doorway is a good, simple, stone-moulded hood. The plan of the building is an octagon, with a range of large lower windows occupying six sides, the *mihrab* and door, opposite each other, being in the other two. There are two ranges of upper smaller windows, the highest being just below the springing of the dome, in that deep band of slightly projecting corbelling, triangled out, which occurs so often in Turkish domes. These top windows are stained glass, the others plain; but the light coming from the lower ones is subdued, as the wall is very thick, and the straight ingoings catch a lot of light. The interior defies description. A rich blue-green dado of hexagonal tiles, with a

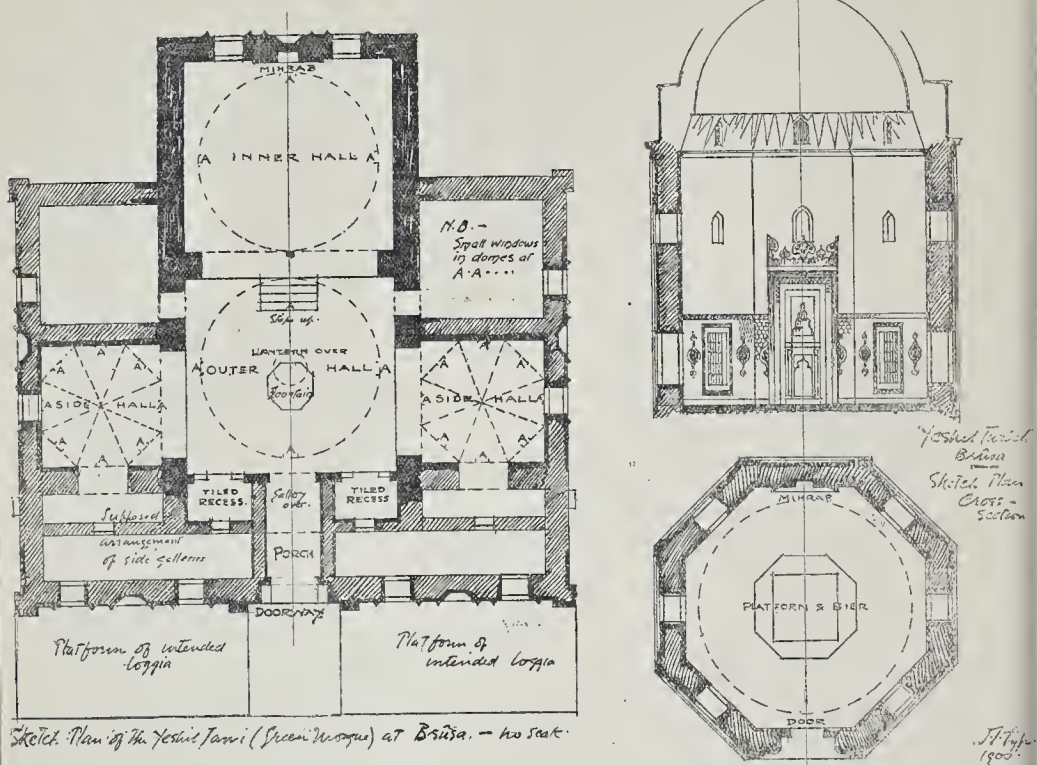


Fig. 5.—Plans and Section of Green Mosque and Turbeh, Broussa.

border at the floor and ditto at top, runs right round to a height of about 10 ft. It stops against the doorway and *milrab*, and the windows are set in it with independent borders. At the sides of each window, about midway up the dado, is an ornamental spot of tiling. At the broader *milrab* and door there is only room for half of this (see sketches). All is white plaster above the dado, except for a little centre flower painting in the dome, not of much account. The stone floor has an octagonal centrepiece, raised one step, and ornamented with tiles on the edge. Above this, again, is a square tiled platform, about 18 in. high, for the bier. This platform has a vertical design of tiles of great beauty and exceeding richness of colour—a perfect harmony of blues. The *milrab* has some exquisite work; in fact, it is full of the most delightful detail in form and colour. The small round pillars, covered with *faience*, and the centrepiece over the pointed niche-head, are specially noticeable. In the latter one notices the delicacy and beauty of the contrasts between the main ground colours: pale mauve competes with a light blue-green, helped by a judicious balance of white and green-yellow. There is an immense amount of study in the floral patterns. The lighting is perfect. Leaving the *Turbah*, we come to the mosque. 'Outside, certain windows have a thin blue strip of tiles, 2 or 3 in. wide, inside the architrave. This has a good effect in combination with the white marble. The interior, considering its size, for bigness and beauty and rest, impressed me more than almost any I know. It is on the two-dome system, and quite successful, owing to some simple expedients. (1) The entrance-domed hall has two side-spaces opening off it, roofed with hexagonal domes, and with floors raised above centre level, which gives the entrance a breathing room that is particularly valuable. (2) The floor of the inner domed hall is raised some 2 ft. 6 in. clear drop above the other, with a small centre stepway only. (3) There is

a flat marble arch between the domes, which is good, as it does not exclude too much light, or separate the domes too much. (4) There is a small octagonal fountain under the outer dome, which helps it to be more obviously an entrance to a higher shrine. (5) There is a circular top light over this dome, so that the inner dome, being darker, has more of an air of mystery. All the richness of tile decoration (and this part is quite as fine as the *Turbah*) is concentrated on the doorway, side recesses and upper gallery, so that the entrance end is bright and cheerful, yet with an air of quietness about the side niches of the door; the inner part is plain, sombre, and tomb-like. Yet with all the accessories the two are so perfectly joined together that there can be no question as to their being one building. Standing in front of the dais, looking back to the door, one notices the fine effect of the subdued light in the rich tile work there, all in a beautiful scheme of blue. There is a dado in this building as in the *Turbah*, but not so fine; the colour is a plain dark green. There is nothing particular about the *milrab* and *minber*.

The lighting arrangements of this mosque are most instructive for study: there are three small windows in each of the main domes, at the springing; and the side domes have each six similar windows. The other windows, shown on the plan, give a subdued light, as in the *Turbah*. The gallery on each side of and above the entrance is a most interesting feature. It is shown, to some extent, in the photo, but its plan is by no means clear to me. Undoubtedly it bears some resemblance to the similar feature in the Mosque of Mourad II., of which Texier has a plan.

Other most interesting mosques in Broussa, besides those already mentioned, are the *Ulu Fami*, or Great Mosque, the Mosque of *Emir Sultan*, and the Mosque of Mourad I. at *Tehekirgeh*. The former is a very large building, more like a bazaar than a mosque, and quite dominates the general view of the town.

It is of large simple-pointed work, with two tall minarets and a forest of domes. It is finished in stucco, like most of the Constantinople mosques, and this poverty of material contrasts rather unfavourably with the Green Mosque, which is finished with marble both outside and in. Some very good brickwork is also to be seen at Broussa—in the exterior of the Mosque of *Emir Sultan*, and in the various *Turbahs* at the Mosque of Mourad II. The type of entrance loggia which was so common here, and which was continued as a feature in the Constantinople mosques, may be well seen from the Mosque of Bayreid I.

In considering the conditions of the problems presented to us by these Turkish buildings, we can learn by seeing the use the builders of them made of their materials to hand in *tolerance*; that is to say, of conditions of climate and religion, as well as hard, matter-of-fact forces of everyday design; and following from this, by the good old lesson on the justification of apparent eccentricities, common in some form or other to every period of architecture. What strikes as boldness in a design, when we come to analyse its constructive meaning, may appear simplicity itself when the effect as it stands is only taken into account, and unworthy of any except admiring notice. For example, stripped of its effects and considered on plan, the corbelling out of the main domes of the Green Mosque on three sides only may appear freakish, but in reality it serves to make one interior of the two domes, especially as softened by the beautiful form of corbelling adopted by the Turks and all Saracen races. The fact, too, in the same building of a higher shrine inferior in cheerfulness to the lower entrance part seems peculiar on the face of it, apart even from any religious motive; but when we see that this effect is balanced by a stately gravity in the design of the entrance wall, and, moreover, is quite reasonable in itself from an æsthetic point of view, we realise something here which gives a sense of fresh perception, and, as such, is, of course, of the

highest value. The sense of strangeness in contemplating Eastern buildings at the first rush is inevitable to us, because the real East is far removed from the West in everything, including such a small thing as the treatment of an interior. The elements of the composition in a mosque interior are the fountain of cold water surrounded by cool and restful colours, and an exquisite diffused light. In the best mosques there is no attempt at strenuousness in anything. The mihrabs, though often marvels of detail, are set as a rich door in a plain wall would be, which means that they draw attention to themselves, but do not detract from the simplicity of the composition as a whole. Naturally, in Eastern countries the smallness of the entire window area necessary for lighting a building adequately, vastly affects the conditions of design. It is this partly, perhaps, that makes the domical construction of these countries so easy, as there is no need to be eternally fussing about this or that window which interferes with this or that construction. The total effect of lighting in two interiors (one Western and the other Eastern) may be the same; the former with its many windows, and the latter with its few. The advantage, however, for purposes of decoration is distinctly with the East; the wall-spaces are broader and simpler, and the absence of an appearance of lighting forcing itself on one gives greater restfulness to the decorative effects. Thus in a measure the entire question of Eastern decoration must be considered with reference to itself alone. The large use of tiles in decoration is the prevailing characteristic of Persian art and what emanated from it. This makes possible the large spaces of plain colour which are necessary when only borders and spots of pure ornament are used. Hexagonal tiles of an exquisite blue-green, relieved by gem-like touches of pure colour, such as we see in the Green *Turbah*, are, under the circumstances, perfectly satisfying. It is a question of surroundings and mental attitude to a large extent. Coming from the blinding sun and dusty glare of an Eastern summer into such a perfectly neutral half light, with its cool marbles and fountains, and its atmosphere of satisfying colour, one feels a sense of the fitness of things. Use and wont and perception of long ago have made the materials which best suit the situation. The practical conclusion of the whole matter is to try and find out how the Moslem has solved the ordinary problems of his building, for naturally he has a certain discount to start with, having Persian tiles, which belong to the world's chiefest treasures of art, at his command. But if there are evidences of thought in their setting—as I think, will easily be found in such buildings as the Green Mosque at Broussa—we can have scope, after the first burst of admiration, to contemplate wise solutions of problems which come very near to us after all. There is a strange freedom also in the treatment of much of the Turkish work which makes it easy to institute a comparison with modern work. For instance, Mr. Philip Webb's conception of stone detailing seems to me similar to the attitude of the Broussa builders in a like capacity. A strong feeling or material is evident, and a daring reserve in design which is nearly always justified in effect."

After the paper, Mr. Fyfe showed a number of lantern slides illustrating the newly-excavated palace at Knossos, Crete, and gave a brief description of numerous drawings of the same which were hanging on the walls, including architectural plans, details, and large photos, and a large selection of the original drawings of the painted stucco work which was found. The slides and drawings were kindly lent for the occasion by Mr. Arthur J. Evans, Keeper of the Ashmolean Museum at Oxford, who was present at the meeting, and who referred in detail to an architectural representation on a small scale which had been found in fragments of coloured stucco; but without the illustration of this it would be useless to report his remarks.

Mr. Phené Spiers said that the whole subject was absolutely new to all of them, and it was impossible for anyone who had not been over the ground of the discoveries in Crete to say much. He was struck by one remark which Mr. Fyfe made in the first part of his discourse, *i.e.*, where he noticed how strange it was that in those early towns the people built in materials of the most lasting

nature, and also carried out works built in the poorest material; but that which was strangest of all was that evidence should now be found of crude or unburnt brickwork. One would suppose that a wall built of crude brick which, here in England, a week's rain would destroy could not have stood through so many centuries; but in some of the photographs they had seen there was distinct evidence of some material, probably the crude brick he had referred to, above the walls of stone. Sometimes the walls were built of rubble masonry with clay mortar, and that was the description of a wall found by Schliemann at Troy. Of course, there were other instances of crude brick walls lasting through many centuries, but they were in countries where the intense dryness of the atmosphere made destruction almost an impossibility. Professor Petrie found at Denderah, in Egypt, an arched vault with three rings of voussoirs of unburnt brick, dating from 3,500 years B.C. It must be borne in mind that these ancient bricks were very different from those which people might think of. They were dried in the Egyptian sun, and their hardness was so great, that it was very difficult to scratch them with one's nail; they acquired a hardness of which people in this country had no conception. Vitruvius mentioned the very great care which had to be taken in preparing these crude bricks, remarking that they must be exposed for at least two years in the sun, and that care must be taken that at first they were not exposed too much to the heat of the sun, or otherwise they would crack and would not last. It was interesting, therefore, to notice in some of the illustrations they had seen the remains of crude brick on the top of the broad and well-built stone walls. The same construction was employed in the temple of Hera at Olympia—at least, that was Dr. Dörpfeld's conclusion. The paintings they had seen that evening were very interesting, because they were so natural. Work of a similar kind had been found in Egypt. A certain king gave up the religion of the country, and in changing it had adopted a system of decoration which, as in the case of the pavement of Tel-el-Amarna, one might think the work of the Japanese of the present century. We wanted to know a good deal more about the architecture of the Seljouks. He desired to propose a hearty vote of thanks to Mr. Fyfe for his lecture. They could congratulate themselves that Mr. Fyfe was going out again to Crete, and no doubt at some future time he would communicate to them something more on the subject.

Mr. A. C. Dickie, in seconding the vote of thanks, said that the paper was very interesting, especially that part relating to the plan of the palace at Knossos. That plan was rather confused, and it was almost impossible to come to a conclusion in regard to it unless one had been over the ground. The suggestion he had made in regard to it was suggested by a mosaic of the sixth century he had seen, where the columns were shown in exactly the same manner as in the illustration shown that evening—in the manner of primitive people who combined elevation and plan in their drawings. It seemed difficult to find anyone who could appreciate Turkish architecture unless it was seen on the spot. Seeing Saracenic architecture in drawings was not the way to judge it, and unless seen in its native soil it was difficult to appreciate its beauties. There was much in Turkish buildings that violated what were considered to be the canons of design, that one often forgot the frequent harmony of the whole.

Professor Beresford Pite said he was sure they would all wish to include Mr. Evans in the vote of thanks for the honour he had done them by attending the meeting, and by lending the photographs that had been shown that evening. As to the newly-discovered and now world-famous frescoes from Knossos, one could speak on the subject without much knowledge, but they suggested to him something which he had not fully realised before. If they reviewed the whole growth of Greek art as they knew it from the period indicated in the colour work in the Cretan palace to the period indicated by a Roman city like Pompeii, he did not think they could lose sight of the fact that Greek architecture which lay between these two extremes was coloured in the same key and with the same richness, and it was interesting and suggestive that the same-colour schemes had been found in earth-bound and ash-bound cities separated by such a long period of time. In some of

the fresco work which they saw that evening there was an extraordinary naturalistic expression. The figures were very life-like, and were distinct from the ordinary Egyptian form, to say nothing of the perfect freedom and beauty of drawing. He was glad Mr. Fyfe had not been to Egypt, because had he done so they would not have had his careful description of some commonplace but interesting Turkish buildings. That, of course, raised another question, *viz.*, had the Turks any art at all—any building materials which they did not borrow, and any forms which they did not degrade? In fact, was not the whole of Turkish art a degradation of what had preceded it?

Mr. Walter Crane supported the vote of thanks to Mr. Fyfe for his paper and to Mr. Evans for his help on the occasion. He had been attracted principally on account of the frescoes which, as seen from his position, reminded him of a sort of blend of Egyptian and Etruscan work. Closer examination revealed resemblances (in treatment of drapery and extremities) to the work of early Greek vase painters. He did not know about their being naturalistic (except the modelled and coloured bull's head, which had great vivacity), for that was a comparative term, and as they were treated on one plane they could scarcely be said to be naturalistic. He would like to know more about the colours—whether, for instance, they were the ordinary earth colours, or colours of which we did not know. As to the scheme, frequent use of turquoise blue and deep red reminded one of Pompeii and Egypt.

Mr. A. T. Bolton said it would be a misfortune if Mr. Fyfe, who seemed to be inclined to take up the study of Turkish architecture, were to be discouraged by the idea that Turkish architecture was merely a degradation of what had gone before. Some of the later Turkish buildings possessed a value of their own, for in them the ideas of the Arab builders were carried on. One did not get the detail, but as far as the forms were concerned, in the ideas of the builders of some of these comparatively late and rather unprepossessing buildings there was a distinct value. The very late mosque on the citadel at Cairo, for instance, was interesting, for in that building could be seen a dome supported by four half domes. Some of the Turkish mosques in Constantinople, judging from drawings, he thought might be of interest and value; while some were very extraordinary; for instance, there was one where the domes were supported by immense octagonal pillars. He thought that if Mr. Fyfe examined some of those mosques he would realise that they afforded valuable information in the way of development. Somewhere about the Renaissance times some of these Oriental buildings were worked out by Italian architects who had gone abroad. Nearly all Turkish architecture was the work of foreigners, and he did not believe that the Turks, as a people, ever did any building at all; it was all the work of Greeks, Arabs, Italians, Frenchmen and others. In short, the Turk did not appear to have any building instinct at all; but, however unprepossessing their work might be, he did not think it should be neglected, and anyone who took up the subject would do a work of much value.

Professor Elsey Smith said, in regard to the frescoes, it would be interesting to compare them with a very small fragment which existed in the museum at Athens, and which was found close to the Erechtheion in 1886. It was on a much smaller scale than the drawings they had seen that evening, but it represented the figure of a warrior with a shield, on which was a drawing of a satyr. In that case, also, the figure was in elevation, and the colour was perfectly flat; but the outline appeared to be drawn with a strong brown line with the colour filled in between. Was there any explanation of the great tank in the throne-room of the palace, or of the curious set of chambers running out of the long passage? It was a matter of great satisfaction that a member of the Association should have taken part in such work, which rivalled in interest anything since the days of Mycena. As to the other part of Mr. Fyfe's paper, it was an important contribution to the history of architecture in Crete. It was disappointing to find that the remains were so extremely slight of almost all periods.

The vote of thanks having been heartily agreed to, Mr. Arthur J. Evans said he could bear testimony to the very good work that Mr. Fyfe has done in connexion with the excavations which he (the speaker) undertook last year at Knossos. The results of the

excavations were very surprising. He had known the site for some years, and Schliemann had his eyes on it once. When he was especially studying the existence of early writing in Crete, it seemed very important to undertake the excavation of the site, where the remains of wall paintings, curious signs, &c., might refer to written characters. He secured a part of the site as early as 1895, but it was only last year that he obtained the remainder. Although he had great hopes of finding something during the excavation, he had been inclined to think that with such a site, occupying an elevated bit of ground in the immediate neighbourhood of a great city which had lasted through Greek and Roman times, and not far from another city—Candia, which was its immediate successor, and at one time a great fortress—it seemed quite hopeless that there should be much of interest left under the surface; but the result of a few weeks' digging was to reveal the astonishing fact that the site had practically never been touched since the days when the Mycenaean Palace was destroyed. He supposed that last season they excavated about two acres of the site, and over the whole extent there was hardly a bit of pottery later than the Mycenaean period. Another curious fact was that very often a foot or so below ground began the remains of intact walls, with frescoes on them, as intact as when left by the workmen. It was very astonishing to dig down a few inches below the surface and find these walls—to find a carved throne unharmed; beautiful alabaster vases laid on the floor just as they were left. In fact, if one took the arrangement of the throne-room—the benches, the throne itself, the pavement with the traces of painted cement, and the very beautiful stone tank, one might imagine oneself in the room of a Pompeian house, though the palace at Knossos was fourteen centuries older than Pompeii. As he had said, there was nothing later found than of the Mycenaean period, and what pottery had been found fitted in generally with that found in the tombs of Mycenae, and also with fragments found in Egypt under circumstances which enabled one to date them absolutely to the time of the Pharaohs of the eighteenth dynasty. There was a great deal of resemblance, too, between the fragments found and those found by Professor Petrie at Tel-el-amarna. In addition to that, there was evidently a very intimate contact with Egypt, as was seen in the Egyptian forms of griffins and sphinxes. Even in the procession there were certain Egyptian elements which curiously recalled some of the processions on the tombs of the times of Thothmes III. at the beginning of the fifteenth century B.C., in which the people called Kefts, the islanders of the sea (who evidently were the representatives of the Mycenaean civilisation), were depicted. People were bearing vases precisely similar to those found in the palace at Knossos. But the most important discovery of all was the establishment of the fact that these people possessed a highly elaborate system of writing. Some of the paintings went back to the period of fully developed Mycenaean art, viz., about the fourteenth century B.C., but beyond that there was evidence of a still earlier stage. As to the different dates of the walls, there could be no reasonable doubt that the walls to a certain extent represented certain dates, but on the whole there was a great deal of unity about the main walls of the palace. The walls went off at right angles; there was the great gallery running along the main access, but here and there were slight deflections from the original direction; and in many cases fragments of the early wall were built into the later. Some of the curious symbols, cut on gypsum blocks, were religious; the double axe, for instance, which appeared in conspicuous positions, and which occurred on nearly every block. There were also found on the floor level vases of a very beautiful ceramic style, and which showed them to be more or less continuous with the Mycenaean period. There was one bit of fresco which unquestionably represented the same stage of art as those earlier pre-Mycenaean vases. In addition to that, there was found a very interesting monument of a figure with an inscription on three sides, and about which Egyptologists seemed to be pretty well in accord, and the approximate date of which was 2,000 B.C., corresponding to the earlier period of the palace. As to the frescoes, there were one or two specimens of what might be called the minotaur style, representing ladies in extraordinary aspects—with narrow waists, and

with their hair most elaborately curled and frizzed. One thing was clear, and that was that Crete was the centre of a very high civilisation. Perhaps in the earlier time it had few foreign relations, but by the time of the great Mycenaean days, it was becoming more or less cosmopolitan; it took ideas from Egypt and Assyria, and in the main was independent. Some of the monuments were very naturalistic in style, and, so far as the animal representations were concerned or in the portrayal of nature, they were never rivalled in any period of classical Greece.

Mr. Fyfe also replied. As to the way the frescoes were treated, the red was very permanent and would stand scrubbing, but the blue was rather perishable and came off somewhat easily. As to Turkish architecture, he thought that later examples had a good deal of Renaissance influence in them. He agreed with Mr. Bolton in thinking that later Turkish work might be usefully studied now. Of course Cyprus was more interesting than Crete, and it could not be expected that Crete would produce anything like the beautiful mediæval work of Cyprus.

The meeting then terminated.

The next meeting will be held on Friday the 15th inst., when Mr. E. S. Prior will read a paper entitled "Gothic Architecture, and the basis of its Beauty."

Illustrations.

CHOIR STALLS, AND VIEW IN CHOIR, LINCOLN.

THESE drawings from Lincoln Cathedral, as well as that of the entrance to the Galilee Porch at Ely, form a portion of the excellent work done in connexion with the Pugin Studentship of the R.I.B.A. by Mr. Jas. McLachlan, of Edinburgh, who gained the Studentship last year.

The stalls form a fine example of Gothic woodwork of the Decorated period. Of so well-known an interior as the choir of Lincoln it is unnecessary to say anything here. Mr. McLachlan's charming sketch shows it from a point of view different from that most usually taken, looking back westward from the eastern portion of the choir. In the distance, between two of the piers, are seen the stalls shown in the larger drawing.

GALILEE PORCH, ELY.

THIS drawing shows the entrance to and interior of the Galilee Porch added to the Transitional front of Ely in the Early English period, obviously in the first instance for a structural reason, viz., to afford a western abutment to the arches of the tower, which had probably shown some signs of requiring such support. This piece of "engineering" was turned into an exquisite piece of architecture, more satisfactorily to be viewed in the interior than on the exterior, where it can be seen in connexion with the older work of the front, with which it does not harmonise; while the interior is complete in itself.

ANCIENT REMAINS IN CRETE.

THESE should more distinctly be defined as Venetian remains in Crete, with one exception, the view of the Turkish arches in Candia. They form a part of the illustrations to Mr. Fyfe's paper at the Architectural Association on "Architecture in Crete and Turkey." The two sketches at the top are by Mr. Fyfe; the other illustrations are from photographs taken by Mr. Welch.

TURKISH BUILDINGS AT BROUSSA.

THESE are also in illustration to Mr. Fyfe's paper above referred to, and represent three portions of the "Green Mosque" at Broussa, and the "Green Turbeh." They are described in Mr. Fyfe's paper on another page, in connexion with which will be found also a sketch plan and section.

NEW CHURCH, KIRKCALDY.—Dunnikier United Free Church, Kirkcaldy, was opened on the 31st ult. Designed by Mr. John B. Wilson, Glasgow, the church is fitted for electric light, but is in the meantime lighted temporarily with gas. It is seated for 740, and has a hall for 260 attached, with session-room, vestry, cloakroom, &c.

THE SURVEYORS' INSTITUTION: FUTURE OF THE LONDON WATER SUPPLY.

A MEETING of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, Mr. J. Shaw, the President, in the chair.

The secretary, Mr. Julian C. Rogers, read the following address to be presented to His Majesty the King, which had been adopted by the Council:—

"We the president, council, and members of the Surveyors' Institution, in general meeting assembled, respectfully approach your Majesty with an expression of heartfelt grief at the great calamity which has befallen the whole Empire in the death of our beloved Sovereign, Queen Victoria, and our gratitude for the blessings which the nation has enjoyed for the many years of her long reign under the influence of her Majesty's exalted character and noble example. While thus expressing to your Majesty and the Royal Family our respectful sympathy, we desire to offer our sincere congratulations on your Majesty's accession to the Throne of the Empire and an assurance of our loyalty and devotion."

The President moved the adoption of the address by the meeting. The motion was carried, the members standing.

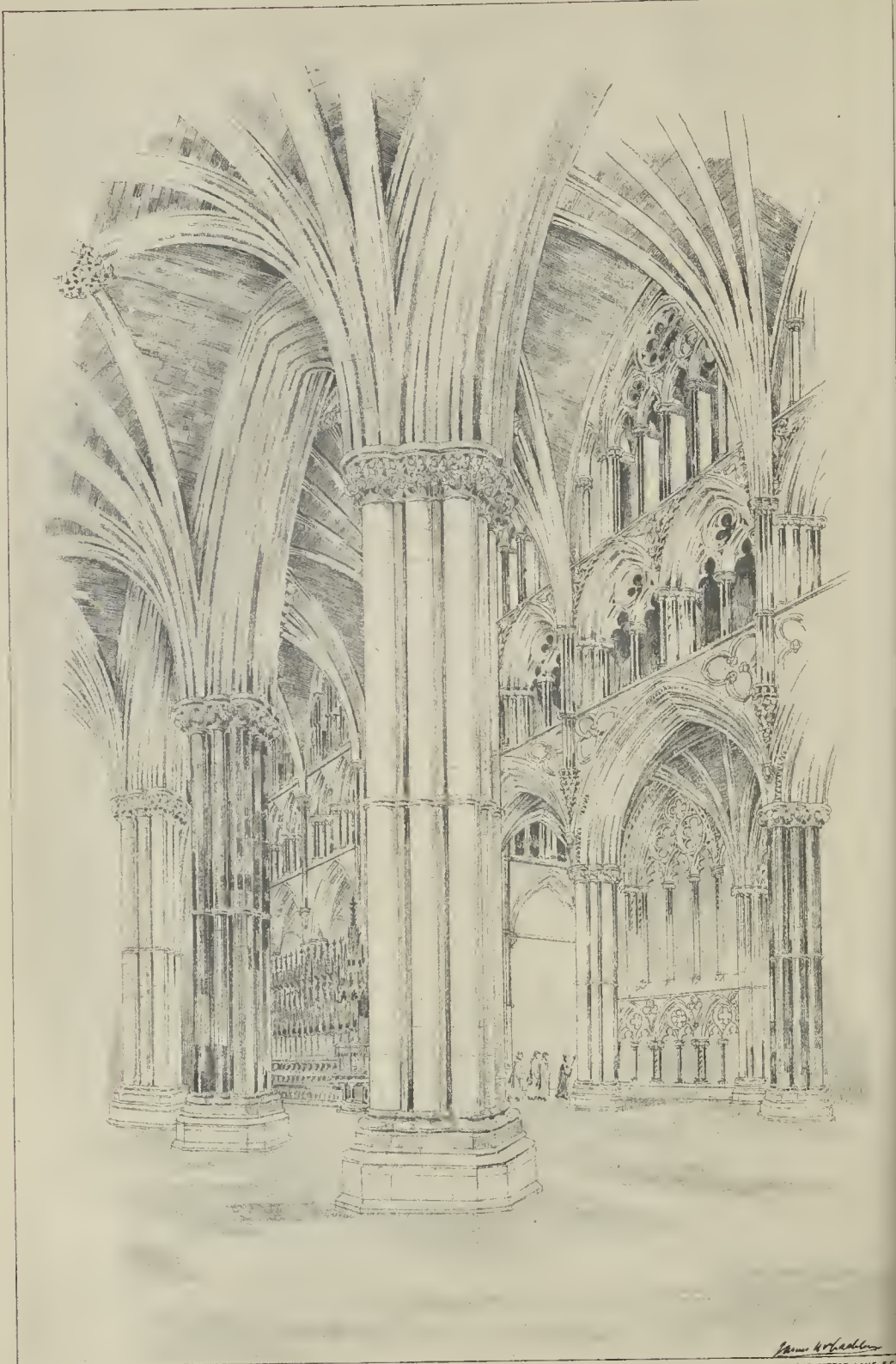
It was announced that the address would be inscribed upon vellum.

The meeting then resumed the discussion on Mr. R. E. Middleton's paper on "The Future of the London Water Supply," which has occupied the attention of the two previous meetings.

Mr. E. K. Darvall, in a letter which was read by the secretary, stated that at the beginning of 1892 the eight London companies supplied approximately about 31 gallons of water per head of the population. Constant supply was afforded as follows:—Chelsea, November, 1891, 23 per cent.; November, 1900, 100 per cent. East London, 98 per cent. in November, 1891, and 99 per cent. in November, 1900. Grand Junction, 75 per cent. in November, 1891, and 100 per cent. in November, 1900. Kent, 56 per cent. in November, 1891, and 93 per cent. in November, 1900. Lambeth, 53 per cent. in November, 1891, and 76 per cent. in November, 1900. New River, 44 per cent. in November, 1891, and 95 in November, 1900. Southwark and Vauxhall, 77 per cent. in November, 1891, and 93 in November, 1900; and West Middlesex, 43 per cent. in November, 1891, and 98 per cent. in November, 1900. The great increase in the percentage of constant supply was a point upon which the companies were to be congratulated. At the present moment the supply was afforded to about 6,200,000 persons at the rate of nearly thirty-three gallons per head per day. If the population in the said area had increased as was anticipated, according to Mr. Middleton's figures, the number would have been 6½ millions. It was therefore apparent that the population was not increasing at the rate that was anticipated. There could be no doubt but that a domestic supply of seventeen gallons and a trade and public supply of eight gallons was ample for London or any well-managed undertaking (unless the trade supply was abnormal), or a total of twenty-five gallons per head daily. It was apparent that a loss of over eight gallons per head daily was taking place, or approximately 50 million gallons a day, or a supply for an additional two million persons, or 30 per cent. more than the number at present supplied, as pointed out by himself and partner, Mr. Stevenson, in a pamphlet on the Metropolitan Water Supply published in 1892. These 50 million gallons daily led to an expenditure for collecting, pumping, and filtration of nearly 50,000l. annually, and the expense of nearly 10,000l. yearly in the additional quantity of sewerage which had to be dealt with by the London County Council at their pumping stations. In comparing the month of November, 1891, with the same month in 1900, it is found that only one company—the East London—had improved its position in the matter of checking waste. The other companies had all gone on the backward path, thus:—Chelsea, 1891, 33.87; 1900, 45.25; Grand Junction, 35.49, 45.29; Kent, 27.24, 39.21; Lambeth, 27.46, 33.29; New River, 29.85, 30.25; Southwark and Vauxhall, 29.97, 30.19; and West Middlesex, 29.08, 32.63. The notice recently published in the papers intimating that the Metropolitan Water Companies were intending to propose fresh

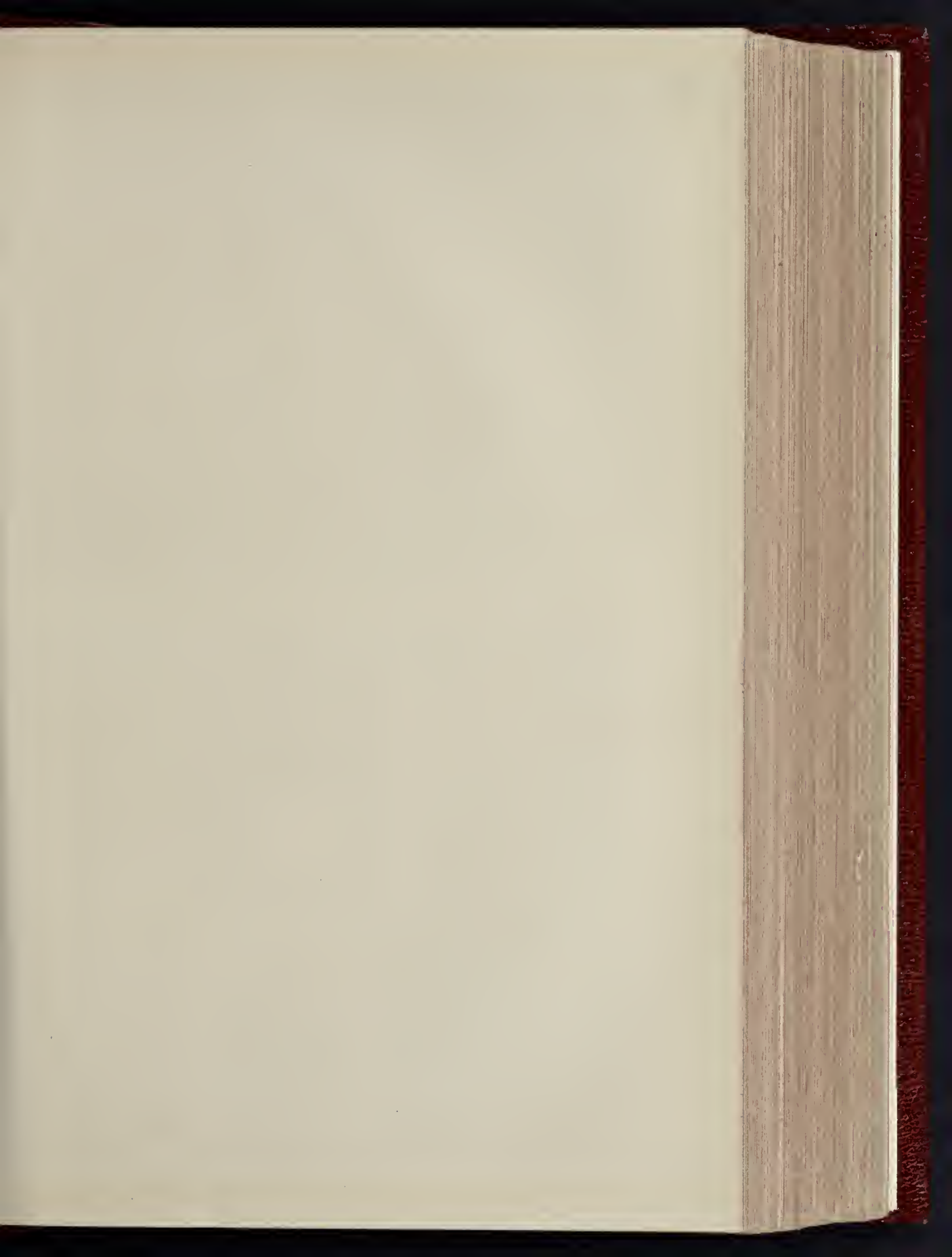
* See our issues for December 15 and 22 and January 19.





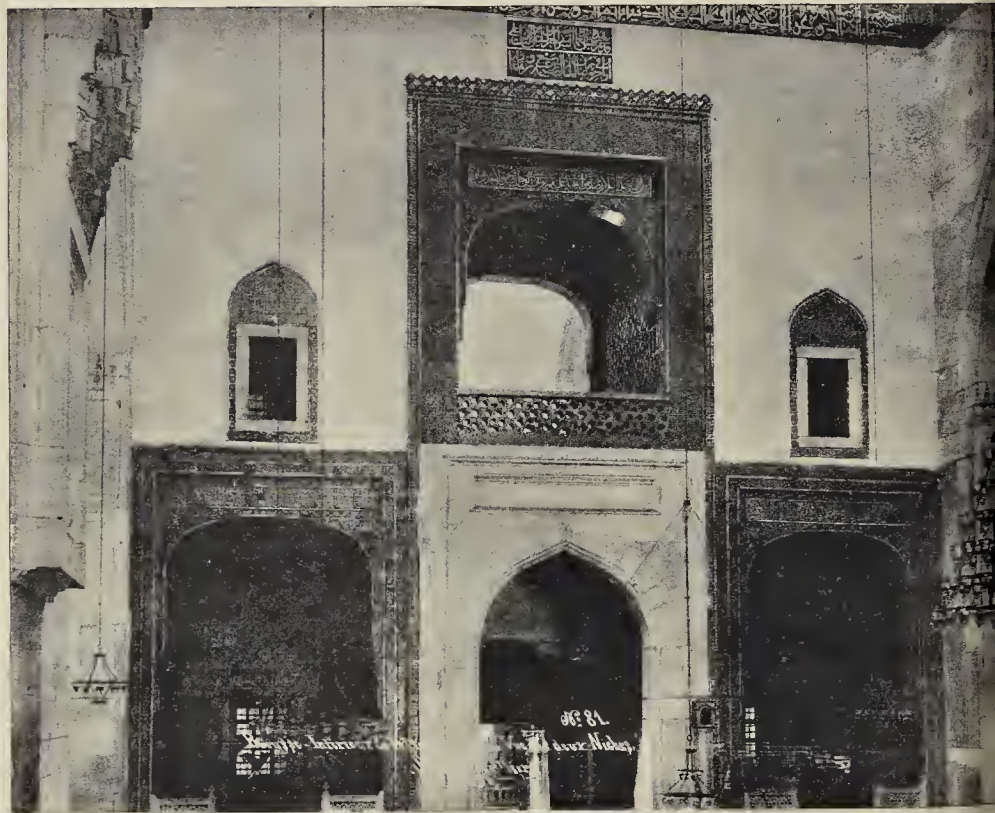
INK-PHOTO, SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE CHOIR, LINCOLN CATHEDRAL.—DRAWN BY MR. JAMES MCLACHLAN (Pugin Student, R.I.B.A.).





ENTRANCE DOORWAY, GREEN MOSQUE.



INTERIOR OF GREEN MOSQUE: ENTRANCE END.

FROM PHOTOGRAPHS BY SEBAH AND JOUILLES, CONSTANTINOPLE.



EXTERIOR OF GREEN MOSQUE.



THE GREEN "TURBEH" (TOMB OF FOUNDER).

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



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GALILEE PORCH, ELY CATHEDRAL.—DRAWN BY MR. JAMES McLACHLAN (Pugin Student, R.I.B.A.).

regulations under the powers of their Acts of 1852, 1871, and 1897, was apparently an earnest of their intentions to bring the regulations of the water companies in London into harmony, and it was to be hoped more in unison with those prevailing in well-managed undertakings in provincial towns such as Portsmouth, Nottingham, Norwich, Bury, Derby, &c. Unless regulations similar to these were adopted in lieu of the enunciated regulations usually finding favour with the Local Government Board, they would be of little more use than those existing at the present time.

Mr. Hunter stated that he was connected with Mr. Middleton in carrying out the new water-works at Staines, and he could congratulate him upon his paper; it was written in that scientific spirit which appealed to the judgment of them all. He agreed with him in his conclusions generally, and the deductions by which he had arrived at them. It appeared to him that Mr. Middleton had brought forward many cogent reasons with regard to wells, and it was quite possible that they could derive from wells a much larger supply than they at present availed themselves of. He proposed to confine his attention to the question of the development of the Thames and the means of storage. The matter divided itself into four divisions. First, what was likely to be the requirements of London in the future? Secondly, was the quality of the present supply good? Thirdly, was the available quantity sufficient for many years to come? And then, if Nos. 2 and 3 be answered in the affirmative, there remained this question—which was the cheaper method of supply, and therefore the more advantageous, to London? With regard to the future requirements of London it was very difficult to arrive at reliable figures so far as population was concerned. Generally, he agreed with Mr. Middleton, his figures being fairly in agreement with those accepted by the Balfour Commission, who considered the question up to 1931, by which time they anticipated that if London were to increase in the same proportion as between 1881 and 1891 it might reach a population of about 14½ millions. They took as the rate of supply about 35 gallons per head per day, and that seemed to him to be ample, because, for instance, in Norwich it was 17, Manchester about 32, Liverpool about 28, and Sheffield about 26. He was glad to find that they would have the support of Mr. Whittaker in their endeavours to check waste. The water companies had that day appeared before a tribunal appointed by the Local Government Board with the view of obtaining reasonable regulations which would assist them in guarding against waste. Waste was of no use to anybody, but was detrimental to the interests of the large body of consumers. He hoped that in this matter the companies would have the support of the Institution. The fact had been arrived at that in 1901 there would be required a supply of 717 million gallons, and that 400 million gallons would be taken from the Thames. He proposed on this occasion to confine his remarks to the consideration of the 400 million gallons which had been shown in the Balfour Commission might be required in forty years from the present time. With regard to the question of quality, several gentlemen—Mr. Lovegrove, for instance—had a doubt as to whether the Thames could be used, and Mr. Whittaker said that the river must be adequately safeguarded, it doubted whether that could be done. Mr. Vernon Harcourt had similar doubts, but they turned to the reports of the responsible bodies during the last few years they could see that the quality of the water was absolutely secured. Since the date of the Balfour Commission the Thames Conservators had obtained their Act of 1894, and they have used it with great effect. Anybody who had observed the river must have seen that it was in a very much better condition than at that date. Mr. Groves, of the Thames Conservancy, stated before Lord Landaff's commission that the water contained only one part of the impurities it did some eight or nine years ago, and Sir Edward Franklin, in a report dated January 31, 1898, bore testimony to the improvement of the quality of the water, if he had had more experience as analyst to the Local Government Board perhaps than any other man in the country. A great proof of the goodness of the London water was given in the vital statistics of the Metropolis. Apart from the reports of chemists, they could not over the importance of the death-rate.

There never could be such a low death-rate as 18 per thousand if there was an impure or imperfect water supply. He could state with the greatest possible confidence that the water as supplied by the companies of London was of excellent quality. Another point was the quantity obtainable. As they were aware, it was proved by Mr. Moore, the engineer to the Thames Conservancy, in his evidence before the Balfour Commission, that the average flow of the Thames was 1,350 millions daily. The minimum which the Thames Conservancy required was 200 million gallons, so that there was a balance of 1,150 million gallons available for water supply if only reservoirs of sufficient capacity be made to store water. Of course, in time the cost of storage became greater than the cost of obtaining a sufficient supply from an outside source. The supporters of the Welsh scheme at first proposed doing away with the supply from the Thames and the Lea, and anticipated obtaining 415 million gallons from Wales daily at a cost of 38,000,000. They then proposed the Welsh supply as a supplemental scheme, and he did not wonder at their change of front, because in time the Welsh supply would be exhausted, and it would be necessary to revert to the present source, which the supporters of the Welsh scheme now affected to despise. The true solution was to develop our present supply until the cost of that was greater than that of obtaining water from Wales or some other outside source. In estimating the cost of these schemes he used as analogy the cost of the works at Liverpool, Birmingham, and Staines. The Welsh scheme for 121 million gallons daily would cost for works 20,600,000, and the Thames scheme for the same quantity would cost 5,340,000. The interest during construction would be 3,190,000, on the Welsh and 943,000, on the Thames scheme; and the on the Welsh scheme and 2,773,000, on the Thames. So that for 121 million gallons daily supply the cost of the Welsh scheme would be 23,878,000, and for the Thames scheme 9,057,000. For a total quantity of 214 million gallons daily the total cost of the Welsh scheme would be 37,169,000, and for the Thames 17,486,000. Water companies were often attacked and called all sorts of names, but he ventured to think that no public bodies in the world had done more beneficent service for the health, comfort, and convenience of mankind.

Mr. Wheeler, K.C., stated that the discussion was of the highest moment. The whole of this agitation had been commenced, fermented, and brought about because at some unknown period of our future history the population of London might amount to no less than twenty millions. He, personally, did not follow such statistics to any great extent. He would like to point out the exaggeration with which this subject had been treated. Any one who knew the habits of the majority of Londoners was aware that a very small proportion had a morning bath.* He believed that in time this consumption of 35 gallons per head per day might be largely reduced. An enormous quantity of twice purified water was used for washing our streets, and an immense economy could be effected if the tidal water of the river was used. The whole matter was condensed into a few sentences of one of the speakers, who contended that there was nothing whatever to justify the burden and expense of going to Wales for water when it was close at hand. There was no evidence to prove that there was any immediate necessity of going to Wales. When the necessity arose, if it ever did, means would be found to deal with the matter.

Mr. Wilkins said the first difficulty they had to face was the prejudice which had been introduced. The question had become the sport of political party, and it was difficult to find a common basis for any branch of the subject. One would have thought that after the exhaustive inquiry which Lord Balfour of Burleigh made his report would have commanded the respect and adherence of most people; but they found that no sooner was it published than it was attacked, and it was assumed that it was unworthy of credence and that it contained a lot of improbable statements which ought not to be accepted. The same thing had occurred with regard to Lord Landaff's Commission, and he was sure—having attended almost every meeting—that a more

* Apparently this is supposed to be a desirable state of things, and one which ought to be encouraged and continued.—Ed.

patient attention could not have been given to the various interests. They, however, it seemed to him, had one starting ground, viz., that the present supply was adequate for the present requirements, and that the quality was satisfactory. The problem they had to solve was not the present but the future supply, and that depended entirely upon speculation as to how London would grow. In considering the question they must bring in the four tests laid down by Mr. Hunter. There was no doubt that the quality of the water had improved, in spite of the increased population on the banks of the Thames, the Conservators having used their increased powers with a certain amount of vigour, tempered by a great amount of discretion. He did not think it would be wise to supplement Thames water, which during some months was spring water, by very soft water, as the inhabitants of London had become accustomed to their water and a change might result in illness. The colour of Welsh water could not be compared with that of the Thames; and then, again, it would be brought to London through covered culverts which would prevent its being purified by sunlight and air. With regard to the proposed new regulations, the members of Lord Landaff's Commission were strong upon this point, having blamed the companies for not seeking further powers to prevent waste. It had been said that the water companies were bringing in these regulations in order to inflate their market value, but he would like to point out that the fittings were not the property of the company, but of the householders. There would, however, be a certain amount of saving to the companies. It seemed to him that Mr. Middleton had proved his case very well indeed—that the source nearest at hand should be utilised to the fullest extent before they embarked upon an unknown supply.

Mr. Basil Kilis said there was an idea in the minds of a great many people that if they only go to Wales for water there was practically an inexhaustible supply. Mr. Middleton had shown that this was not by any means the case, and he had also shown that the extension of the present system of supply was far cheaper than bringing water from Wales.

Mr. Wiseman referred to the possibilities of chalk.

Mr. Hennell said the storage of Thames water had been well considered from the water companies' point of view, and almost entirely from their point of view, and possibly not from that of the general public. He advocated the system of storage by gravitation, and contended that 300 million gallons, if not the whole 400 millions required, could be taken by this system at times when the flow of the river was considerably above the average. Storage by gravitation would be a great advantage over the present system and would be much cheaper. The Staines works would be very important as the first storage. The second should be at no great distance from Reading, and there should be another reservoir above Oxford. By whom was this work to be done? He could not help thinking that the proper authority was the body whose duty it was to look after the purification of the river. It seemed to him that the conservators who purified the water should store it and supply it to the companies, but what would be better would be that the future water body should also be made conservators of the Thames.

Mr. Hutchinson said the question was not who should be the authority, but whether we should turn away the water supply which was at our doors and go further afield. He was not at all disposed to admit that it was within the region of moral ethics to say we were entitled, because there was a large amount of water existing elsewhere, to take it away and bring it to another part of the country; and no one could predict what change might take place hydrologically in the district. It appeared to him outside the question from a chemical standpoint that because the water was drawn from the Thames, the source of which was looked upon many years ago with suspicion, that therefore you are to condemn it. It was better to trust, in some respects, to the water from an area that required to be looked after with a great degree of care to prevent pollution rather than to put the fullest trust in the idea that you are securing pure water from an area that was beyond the possibility of contamination, when a single shepherd might pollute the water and bring disease to five millions who inhabited London.

Mr. Middleton, in reply, said that in some

cases the speeches had been a little discursive, and had not held very strictly to the matter of his paper. Professor Robinson's remarks were almost entirely alien to the paper. He began by saying that he advocated a system of storage which was different from the system advocated by the author. He, Mr. Middleton, had looked very carefully through his paper and failed to see that he advocated any system whatever. He had, in fact, avoided going into any engineering system outside the question of the supply of water. With regard to the system of storing water by gravitation, he could see conditions in which it might be advisable to adopt it for the present system, but Mr. Hennell had pointed out one weak spot, inasmuch as the storage must be some distance from London. He was bound to disagree with some of the figures given by Professor Robinson. For instance, he said that the cost of storing a million gallons at Staines would be 378*l.*, whereas it would be 184*l.*, and it was possible to make reservoirs so that the cost per million gallons would be as low as 100*l.* Mr. Hennell had said that the water question had only been considered from the companies' point of view. He thought that was scarcely correct, but, at any rate, the companies were endeavouring to do the best for themselves and the best for their customers in giving an ample supply of water. With regard to the question of population, he did not think that it would increase so rapidly as was anticipated; but the Royal Commission, after careful consideration, had accepted a particular rated increase, and he had accepted that because it was authoritative. It was extremely improbable that the population would increase at such a rate, however, and that being so, his point was consequently stronger; if the anticipated population was never arrived at it would never be any necessity to go to Wales. Unlike Liverpool, Manchester, and Birmingham, there was no need for London to go a long distance for water, because there was plenty of it within reach, and there was no possible reason why we should repudiate water at our doors.

The meeting closed at a late hour, Mr. Middleton stating that he would write the remainder of his reply and forward it to the secretary.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Poplar Borough Council 11,360*l.* for pipe sewer and paving works, and 27,360*l.* for electric light installation; the Fulham Borough Council 24,145*l.* for dust destructor and street lighting; the Guardians of St. George's Union 17,500*l.* for the extension of infirmary; the Hackney Guardians 20,770*l.* for the erection of workshops and boundary wall and purchase of lands; and the Woolwich Guardians 10,475*l.* for the erection of a nurses' home.

Standing Orders—Dangerous and Neglected Structure Expenses.—The General Purposes Committee recommended, and it was agreed, that the following be substituted for paragraph 11 of Standing Order 249, relating to the recovery of dangerous structure expenses:—

"As soon as these accounts have passed the Finance Committee and been paid, the whole of the expenses incurred in relation to each dangerous structure shall be charged to the owner, and in cases where the expenses remain unpaid after demand has been made by the comptroller, the necessary proceedings for their recovery shall be taken by the solicitor."

Housing of Working Classes.—Mr. Samuel George Burgess, secretary and manager to the Middle Class Dwellings Company, Rowton Houses, Limited, and Wharnciffe Dwellings Company, Limited, was appointed manager of the new Housing Department at a salary of 800*l.*

Fire Stations.—The following recommendations of the Fire Brigade Committee were agreed to:—

"That the supplemental estimate of 25,000*l.* submitted by the Finance Committee in respect of the provision of additional fire brigade stations in London be approved, and that the estimate of 2,000*l.*, approved on February 1, 1898, in respect of the site for the Homerton sub-station, and the estimate of 2,000*l.*, approved on May 24, 1898, in respect of the station to be established at Highbury, be cancelled.

That the Council do sanction an expenditure of 11,375*l.* for the work of erecting the West Hampstead station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification, and estimate be referred to the manager of works for that purpose. That the Council do authorise an expenditure of 860*l.* in connexion with the electric light installation at the West Hampstead station, and for incidental expenses arising out of the erection of the station.

That the estimate of 13,010*l.* submitted by the Finance Committee in respect of the proposed Perry Vale station be approved; that the Council do sanction an expenditure of 11,000*l.* for the cost of erecting the station; that the work be executed by the Council without the intervention of a contractor; and that the drawings and specification be referred to the manager of works for that purpose."

Applications under the London Building Act, 1894.—The Building Act Committee brought up the following recommendations, which were agreed to:—

Hackney, South (Width of Way).—Retention of a boundary fence wall in front of three buildings on the north side of Homerton-road, Hackney, adjoining Hackney-cut, such wall being at less than the prescribed distance from the centre of the street (the Lee Conservancy).—Consent.

Deptford (Cubical Extent and Construction of Buildings).—An addition to a workshop at the Hatchesham Iron Works, Pomeroy-street, Hatchesham, which workshop and addition will together exceed in extent 250,000, but not 450,000, cubic feet. (Mr. J. Donald for the General Engine and Boiler Company, Limited).—Consent.

Chimney Fire Penalties.—The following recommendations of the Fire Brigade Committee were agreed to:—

(a) That the following be the scale of payments to be demanded under Sect. 30 of the London County Council (General Powers) Act, 1900, in cases of chimney fire:—

Rateable value of premises.	Sum to be demanded	£	s.	d.
Not exceeding 20 <i>l.</i> a year	0	2	6	
Exceeding 20 <i>l.</i> , but not exceeding 30 <i>l.</i> a year	0	5	0	
" 30 <i>l.</i> , " 40 <i>l.</i> "	0	10	0	
" 40 <i>l.</i> , " 50 <i>l.</i> "	0	15	0	
" 50 <i>l.</i> a year	1	0	0	

(b) That the recovery of penalties in respect of chimney fires be left in the hands of the solicitor of the Council.

(c) That the following be the procedure in cases of chimney fires:—(1) that the chief officer of the Fire Brigade do report to the solicitor all cases of chimney fires other than those cases in which the poverty of the occupier of the premises is so apparent as to make it inexpedient for the Council to take action; (2) that the solicitor do then send to the occupier a demand note requiring payment within seven days of the sum mentioned in the scale, and if that amount be not paid within the time limited that the solicitor do take proceedings forthwith, unless there be special circumstances in the case which in his opinion render it advisable that the matter should be first reported to the Fire Brigade Committee.

(d) That a communication be addressed by the solicitor to the chief metropolitan stipendiary magistrate drawing attention to section 30 of the General Powers Act and mentioning the action which the Council has determined to take under that section.

Tenders.—The following tenders were accepted:—

Additional stabling, Kingsland Fire Station.—J. Jarvis & Sons, 293*l.* 19*s.* 6*d.*
Iron fencing, Archbishop's Park.—Hill & Smith, 455*l.*
Iron fencing, Battersea Park.—McVey, 191*l.*
Repair to Shakespeare fountain, Leicester-square-gardens.—R. Harding & Son, 299*l.* 10*s.*
Supply of shell at various parks, &c.—J. Weston & Sons.

Dangers of Electricity.—Replying to Mr. Baker, Mr. Parker said the attention of the Highways Committee had been called to the serious accidents which had happened in Liverpool and Sunderland, where they had the trolley system of electric tramways. No such danger would arise in London, because the Highways Committee had decided on the underground system.

Appointment of Electrical Engineer.—It was agreed to appoint Mr. John Rider Hele, the Chief Consulting and Resident Engineer for electric tramways and electric lighting under the Plymouth Corporation, Electrical Engineer to the Council at a salary of 1,000*l.* a year.

The Works Department.—The Housing of the Working Classes Committee brought up the following paragraph:—

Clare Market, Strand, Scheme—Sheridan, Beaumont, and Fletcher Buildings.—By the provisional order confirming the Clare Market, Strand,

improvement scheme, under the Housing of the Working Classes Act, 1890, as modified by the Council's Improvement Act, 1899, the Council is required to provide accommodation on sites adjoining the cleared area for 750 persons of the working classes to be displaced by the carrying out of the scheme. Working drawings, specification, quantities, and Duke's-court, one of the sites allocated for dwellings, are now completed. These dwellings, consisting of three blocks, will be known as Sheridan, Beaumont, and Fletcher Buildings, and will provide accommodation for 670 persons. In view of the completion of the plans and particulars of the work, it has become necessary for us to determine the steps to be taken for the erection of the buildings. It is essential that there should be no delay in putting the work in hand, as, until the new buildings are erected and ready for occupation, the Council is unable to remove the existing houses on the condemned area. We are urged by the Improvements Committee, who are dealing with the Clare Market properties in conjunction with the Holborn to Strand Improvement, to make provision as quickly as possible for the persons to be displaced, and we have therefore, in order to save time, advertised for tenders to be delivered to the Council on 26th inst. for the erection of the dwellings. We propose to submit to the Council the working drawings and estimate of cost on the same date, and the Finance Committee will, at the same time, report the estimated financial result of the erection of the buildings. We recommend that the course taken be approved.

Mr. Goulding, M.P., said the decision of the Committee was a justification of the policy of those who held that the erection of such dwellings could be done more cheaply and expeditiously by contractors than by the Department.

Mr. Edward White said the work could not only be done better but cheaper by contractors.

Mr. Purchase added that it was impossible for contractors to do work as good as that performed by the Department.

Mr. D. S. Waterlow said the decision of the Committee was because the dwellings were urgently needed; but the Committee's policy had not changed.

The matter then dropped.

Bills Opposed.—On the motion of Mr. Cornwall, Chairman of the Parliamentary Committee, it was decided to oppose the following Bills, which are to be introduced in Parliament this Session:—Gas Light and Coke Company's Bill, London and India Docks Company (Lighterage Rates) Bill, London and India Docks Company (New Works) Bill, and South Metropolitan Gas Company's Bill.

Gift of a Fountain.—The Parks Committee reported that a lady had offered to present a drinking fountain to be erected in Archbishop's Park, Lambeth.

The gift was accepted by the Council.

Russell-street, Drury-lane.—The Improvements Committee recommended and it was agreed:—

"That the estimate of 4,133*l.* 6*s.* 8*d.* submitted by the Finance Committee be approved, and that a contribution be made by the Council on the usual conditions of one-third of the net cost of widening Russell-street, between Catherine-street and Drury-lane, to 50 ft., proposed to be undertaken by the Council of the City of Westminster, such contribution not to exceed the sum of 4,133*l.* 6*s.* 8*d.*"

Proposed Enlargement, Brockwell Park.—It was agreed to contribute 2,250*l.* towards the cost of acquiring certain land for adding to Brockwell Park.

The Council adjourned soon after six o'clock.

BUILDERS' FOREMEN'S ASSOCIATION: ANNUAL DINNER.

The seventh annual dinner of this Association was held on Saturday last week at the King's Hall, Holborn Restaurant. Mr. Henry Hibberd presided, and amongst those present were Messrs. E. C. Ackermann (the President), J. Hibberd, G. Hibberd, Sydney Butler, G. H. Webster, and W. Cook (secretary).

After the toast of "The King and Royal Family,"

The Chairman proposed "The Builders' Foremen's Association." He said it was at such gatherings as this that they became intimately acquainted with one another, and that enabled them to assist each other in business and often in their private matters. There was a sort of mutual help association, for if a member were out of employment, all the others would be looking out for work for him. Mr. E. C. Ackermann, the President, in reply,

said that the Association had been established a little over eight years, and although it might still be termed a budding Association, it had come to stay. Lectures and smoking concerts had been held during the winter, and they had been very successful. They had lately formed a system of insurance in connexion with the Association, the fees of which were very small.

A toast in honour of Mr. W. Cook was proposed by Mr. Ackermann, who referred to Mr. Cook's services as secretary, and Mr. Cook, replying, expressed his thanks.

Mr. G. H. Webster submitted "The Building Trades," and said that master builders had been objecting very strongly to their foremen being members of a trade union. He quite agreed with them, and he did not see how a builder's foreman could do his duty as a foreman and at the same time be a member of the men's trade society. He might be ever so good a man and ever so good a foreman, but it was impossible for him to serve two masters. The master builders in the north of England were formulating a scheme for inducing foremen to withdraw from the trade society, and recompensing them in some way financially for any loss they might incur. He thought the London builders would take the matter up also.

Mr. McKenzie, in responding, said that one of the things which struck them in these days was that everybody bemoaned the fact that they were losing their ability and capacity for building great structures. It was considered that the early Greeks and Romans were the masters of the art, but he ventured to think that the builders of these days were quite equal to the occasion; they had shown by the great transformation that had and was taking place in London that the builders of to-day were worthy successors of the ancients who showed them how to build. So long as they joined together in such associations as this, where members could help one another, improve their skill, and receive culture in the arts and sciences, so long could they expect the men of London to do well.

A toast to the visitors, proposed by Mr. W. Read, and to the chairman, submitted by Mr. Sydney Butler, completed the list.

METROPOLITAN ASYLUMS BOARD.

The weekly meeting of this Board was held on Saturday at the Board's offices, Victoria Embankment, Sir E. Galsworthy presiding.

The tender of Messrs. Bradford & Co., of High Holborn, of 4,580l., was accepted for supplying and fixing the necessary laundry machinery at the North-Eastern Hospital. The other tenders were: Lees & Harrison, Leeds, 3,214l. 16s. 11d.; Lighting Corporation, London, 4,243l.; Matthews & Yates, Swinton, Lancashire, 4,233l.; Berry & Sons, Westminster, 4,057l.; Potter & Sons, 4,001l.; J. & F. May, London, 5,100l.; Morwood, Sons, & Co., Sheffield, 5,178l.; Wenham & Waters, Croydon, 5,280l.; Fraser & Co., London, 5,329l.; Douglas & Sons, Putney, 5,349l.; Thomas & Taylor, Finsbury Park, 5,362l.; Macintosh, Brocklehurst, & Co., London, 5,091l.; Cherry Tree Machine Company, Blackburn, 6,102l.; Manlove, Alliott, & Co., London, 6,405l.

The Finance Committee reported having considered the question of the mode of defraying excess cost of building works over amounts authorised by the Local Government Board's order. The Committee had hitherto authorised small amounts to be defrayed out of current rates without first obtaining the Board's formal approval thereto. They thought, however, that they should have a general authority vested in them to deal with such matters, and they recommended that excesses not exceeding 500l. be defrayed out of current rates. This was adopted.

The Hospitals Committee presented a copy of an account they had received from the accountant detailing the cost of executing the ward pavilions (8 to 18) and workshops at the South-Eastern Hospital. The total cost was 21,721l. The loan sanctioned by the Local Government Board was 21,350l., which left an additional order required for 371l. 18s. The Committee recommended that an application be made to the Local Government Board for an order sanctioning the further expense of 371l. 18s. This was adopted.

The same Committee presented a return showing that 11,515l. 7s. 7d. was spent during 1900 in painting works at the several hospitals.

The Works Committee reported upon the orders received for the erection of White Oak school.

They recommended [and the Board agreed to

accept the tender of Mr. Charles Wall, of Ashburnham Works, Chelsea, in the sum of 112,324l. The other tenders were:—Martin, Wells & Co., Vauxhall, S.E., 115,000l.; J. J. Wise, Deal, 116,035l.; W. H. London & Sons, Footing, 121,888l.; B. E. Nightingale, Albert Embankment, 133,227l.; Stephens, Bastow & Co., Bristol, 135,220l.; R. J. Tonge, Watford, 138,052l.; Foster and Dicksee, Rugby, 140,270l.; Leslie & Co., Kensington, 14,1450l.; Balaam Bros., Old Kent-road, 151,256l. The total cost of erecting, fitting up and furnishing this school is estimated at 137,041l.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The fifth ordinary meeting of the fifty-third session in connexion with the Liverpool Architectural Society was held on the 4th inst., at the Law Library, Castle-street. Messrs. Segar Owen and James Strong were elected as Fellows to the Society, and Mr. A. C. Broadbent as Associate. Mr. G. Haswell Grayson was elected joint secretary, vice Mr. F. E. P. Edwards, who had resigned. The members afterwards considered a draft memorandum and articles of association in connexion with the proposed incorporation of the Society, which had been prepared by the council in accordance with the resolution passed at the last annual general meeting, and, after considerable discussion, the articles were left over for further consideration. The paper by Mr. A. S. Flower, M.A., entitled "Old English Architecture: a Retrospect and a Suggestion," has been postponed until April 15th.

ARCHITECTURAL ASSOCIATION OF IRELAND.—At the general meeting of this Association held at the Grosvenor Hotel, Dublin, on Tuesday, the 5th inst., the following resolution was proposed by Mr. R. M. Butler, and seconded by Mr. F. G. Hicks:—"That the Architectural Association of Ireland, in general meeting assembled, desire to record their sense of the great loss which the nation has sustained by the death of her Majesty Queen Victoria, and their sympathy with his Majesty King Edward VII. and the Royal Family in their bereavement." The resolution was adopted in silence, the members standing. Mr. P. J. O'Reilly then delivered a lecture dealing with the history of Mont St. Michel, in Normandy, and descriptive of its numerous features of architectural interest. The lecture was illustrated by upwards of 60 lantern slides.

ARCHAEOLOGICAL SOCIETIES.

ROYAL ARCHAEOLOGICAL INSTITUTE.—A general meeting of this Institute was held on the 6th inst., Judge Baylis, K.C., in the chair. Professor T. McKenny Hughes, M.A., F.R.S., F.S.A., read a paper on the forms of implements of war and other appliances in use among primitive races of past and present times, pointing out and illustrating by actual examples that many of them were suggested by natural forms. On this occasion he confined himself chiefly to bone objects, first calling attention to the suitability of the material and to its universal occurrence. He exhibited specimens of small bone graving tools from recent mediæval Saxon, Roman, and earlier deposits. He showed apple scoops and flayers made of the limb bones of ruminants, in which one end of the bone remained untouched. He produced some bones from the heads of common fish which almost exactly resembled the fish-hooks made from turtle bone, and used in the South Sea Islands. He was of opinion that the form of the Fijian battle-axe was suggested by the ribs of cetacea, and pointed out the variation in the shape of the proximal end as we approach the head of the animal, and thought that the different ribs may possibly account for the original manufacture of different forms which are observed in the axes, rather than that they were a modification of one original type of weapon. He criticised the statements of some authors respecting the widespread use of the boomerang, especially as to the catéa having been a boomerang. He thought that the early notices, which described that weapon as having been hurled with a thong (amentum), developed into the idea that it had a string attached to it; next, that it could be drawn back by the string; and lastly, dropping the mention of the string, that it was so thrown as to return to the thrower, and, therefore, must have been something like a boomerang.

Mr. R. E. Goolden, F.S.A., read a paper by Dr. Russell Forbes on "Recent Excavations in

the Forum at Rome." The report dealt especially with the remains of the Regia, the official residence of the Pontifex Maximus, which lies between the Via Sacra and the Temple of Vesta. Dr. Forbes gave many quotations to show what history relates about the palace at different periods, which the excavations have confirmed. He also reported on the more recent discovery of the Fountain of Juturna, with its adjoining altar and the inscription. Messrs. Hilton, Wilson, and Rice took part in the discussion.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—The sixth meeting of the Session was held at 32, Sackville-street, on February 6, Mr. C. H. Compton, Vice-President, in the chair. The paper of the evening was read by the Rev. C. H. Evelyn White, the subject being "Some Recently Discovered Earthworks: the Supposed Site of a Roman Encampment at Cottenham, Cambridgeshire." A large plan of the earthworks was exhibited on the easel, and in order that the paper might be more readily followed smaller copies of the plan were furnished to the members and visitors. These earthworks are of a very singular nature, extending over 20 acres of ground, and have hitherto been unnoticed, so far as the writer was aware. Immediately to the north of Cottenham Parish Church is the Cottenham Lode, and abutting upon this lode to the north-west is an unploughed field of about 8½ acres, in which field are situated the principal entrenchments. This field is bounded on the north-east by the Car Dyke; while the roadway known as the Setchell Drove, running nearly parallel with Cottenham Lode, encloses it on that side. There are visible large rectangular ramparts of chevron, or zig-zag formation, with a ditch on each side; the formation extends into the field beyond the Setchell Drove, which cuts through it, and there are remains of geometrically formed entrenchments in the surrounding fields. The trenches are well above the old water level of the Car Dyke, and vary in depth from 6 in. to 2 ft. Mr. White exhibited a large number of pieces of Roman and other pottery, which is found in abundance all over the site; Samian, Upchurch, and red ware, some bearing potters' marks and decoration. One fragment of the neck of a vase, or urn, bore an unusual type of ornament in the shape of a series of straight lines going up from the collar. The only article of personal adornment found was a portion of a bone pin having a series of notches for ornament, somewhat resembling one illustrated in Keller's "Lake Dwellings." The question to be decided by antiquaries was whether these remains indicate the site of a British settlement or of a military position, as the peculiar formation of the entrenchments would rather suggest. At all events, we had here ancient earthworks hitherto apparently unnoticed, Roman pottery in abundance on all sides, surrounded by lines of British and Roman communications, and near to an ancient waterway that afforded means of access to the larger rivers in very early times. In the discussion which followed the paper, Mr. Bull, a resident of Cottenham, who had been largely instrumental in bringing these remains to notice, gave his impressions of their nature.—Mr. I. C. Gould pointed out that the character of the pottery exhibited, which was of the fourth century, and probably late in that, showed that the place had been occupied at that date. He also said that the so-called Samian ware was not real, but British imitation of Samian, and was typical of a late period. The chevron, or zig-zag formation of rampart, was entirely new to him. The Rev. H. J. D. Astley remarked upon the seemingly unique character of the earthwork, contrasting it with the round or oval shape of the British fortifications and the Roman, which were rectangular. It is probable that further explorations will take place, when the rampart will very likely be cut through and sections obtained.

AN IMPROVEMENT IN WHITEHALL.—The Westminster Borough Council have commenced an improvement in Whitehall. The broad pavement along the Government Offices was very irregular; now it is being made rectilinear from end to end, and in some places it is necessary to extend the pavement into the roadway in order to accomplish that object. The surface was very uneven, not having been repaired for some years; now it will be relagged. The work is at present proceeding in front of the Horse Guards, the Paymaster-General's Office, and the Admiralty.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At a meeting of the Institution of Junior Engineers, held at the Westminster Palace Hotel on Friday, February 8, the chairman, Mr. Percival Marshall, presiding, a paper was read by Mr. L. F. Awde on "Electric Power Supply in the Metropolis." After emphasizing the importance of the subject of a cheap and general supply of electricity for power purposes, as evidenced by the attention devoted to large power distribution schemes during the last Session of Parliament, the author referred to the comparatively small amount of electric power at present used in London, and dealt with the difficulties attending the supply of electricity for power purposes from the existing stations in the metropolis at a price that could really be considered as reasonable, and which would induce the manufacturing community generally to adopt this form of energy for machine driving, &c. The disadvantages attaching to the positions of most of the various stations and their results upon the working costs were dealt with at some length, and in this connection a curious fact was adduced, viz., that the average works costs for 1899 were exactly the same for both local authorities and companies, being 191d. per unit in both cases, the advantage resting with the local authority only in the matters of rates and management to the extent of 0.37d. per unit. After a reference to the attitude of the local authorities as to assessments of electric supply stations—when these were not their own property—the author protested against their proceedings with respect to the question of smoke nuisance, and spoke strongly upon the action of the colliery proprietors last year in cornering the coal market, the results of which were so severely felt by all the electrical undertakings, and hinted at some contracting remedy that it might be necessary to find, should their tactics be sustained or repeated. He expressed himself in favour of one large station down the river, generating for power purposes and street lighting only, and submitted detailed estimates for such a station of a plant capacity of some 33,000 h.p., the whole scheme involving a capital expenditure of over one million sterling distributed as follows, the station estimates providing for five triple-expansion sets of 3,500 k.w. each and two sets of 2,500 k.w. —

Lands	£
Generating station	30,000
Mains, &c.	625,000
Distributing centres	105,000
	288,000
	£1,068,000

The system proposed was a 3-phase generation, and distribution at extra high pressure to transforming centres, the low-pressure distribution to consumers' premises being at 500 volts from rotary converters and batteries. The costs of working were set out in detail, showing a total cost of under 4d. per unit, the maximum selling price being suggested at 14d. per unit, or 14d. per h.p. hour. In the case of factories in the immediate neighbourhood of the generating station, and with a view to encourage the erection of such factories, the special price for these was put at the low figure of 14d. per unit, equivalent to very little more than 4d. per h.p. hour. The author dwelt upon the fact that in this country, and especially so in London, electrical engineering was a long way behind the times, and had been far outstripped in the direction indicated by American and Continental practice; but if such a scheme as he had propounded could be inaugurated, some of the grounds for self-reproach would thereby be removed, and the position of the metropolis as a manufacturing centre substantially improved.—As a sequel to the paper, a visit has been arranged for Saturday, February 23, to the Willesden station of the Metropolitan Electric Supply Company.

BOOKS RECEIVED.

EXERCISES IN GRAPHIC STATICS: Part 2: Beams and Girders. By G. F. Charnock, Assoc. M. Inst. C. E. (J. Halden & Co., Manchester.)

PLYMOUTH EYE INFIRMARY.—We are asked to state that the stoves used in the wards of the above-named building, described in a former issue (page 143 ante), are by Messrs. Shorland & Brother, of Manchester.

CHARING CROSS, EUSTON, AND HAMPSTEAD RAILWAY EXTENSION BILL, 1901.

THE FOLLOWING HAS BEEN ADDRESSED BY THE Royal Academy to the London County Council on the subject of the above-named Bill:—

"We, the undersigned Members of the Royal Academy, do most earnestly petition the London County Council to oppose the above Bill, in so far as it affects Hampstead Heath.

We should deplore any tunnelling under the Heath, and the erection of any railway stations, and other railway buildings within the boundaries of the Heath, the wild aspect of which is of incalculable value to London, and to all lovers of natural beauty.

Edward J. Poynter, President.
Ernest Crofts, Keeper.
Briton Riviere.
William D. Yeames.
Val Prinsep.
Thos. Brock.
B. W. Leader.
Andrew C. Gow.
Seymour Lucas.
Hamo Thornycroft.
W. C. Orchardson.
February 4, 1901.

We need hardly say that we are entirely in sympathy with the above protest, and hope it will have the weight with the London County Council which it should have.

Correspondence.

To the Editor of THE BUILDER.

"BUILDING CONTRACTS FROM A BUILDER'S POINT OF VIEW."

SIR,—I have read with some interest "Clerk of Works" comments on the above, and with your permission, give him my ideas on the subject as a contractor's agent.

With regard to the fact that clerks of works do represent the architect there is no doubt, but whether they do so truly and in the way the architect would wish is an open question, or whether they at times place the architect in such a position that he must either side openly with the contractor against his clerk of works (which he would be very loath to do) or must cause the contractor unnecessary annoyance and expense; and as for the information supplied by the clerk of works, my own experience is that it is very limited, and then confined to verbal instructions. I have never known a clerk of works give a signed working detail drawing or definite written instructions.

With regard to "Clerk of Works" wish that Mr. F. Cowlin may write a paper on clerks of works so that he may criticise it, this is eminently characteristic of some clerks of works, who wait until the work is done and then criticise it. How much better would it be if instead of his waiting for anyone to read a paper on clerks of works, he would at an early date give your readers the benefit of his suggestions, so that these improved methods may be put into operation! I should also be glad if he will explain what he means by a builder being more in touch with his foreman.

As regards the builder making a proper agreement with the merchant in respect to the materials he supplies, "Clerk of Works" must know, or should know, that no manufacturer would agree to this. They would willingly agree to supply goods according to sample or as is generally recognised in the trade; but who would risk having their goods thrown on their hands at the discretion of an architect, more especially seeing that damage may be done to them in transit? Not only that, but architects at the present time often specify the manufacturers who shall supply the different materials, thus further tying the builder's hands.

Coming to the question of the quality of the work, he gives your readers his method of dealing with a dispute which is fair and reasonable, and which, I think, no foreman could object to; but at the same time, it may be of interest to the foreman to know of a method I usually adopt when unable to agree with a clerk of works. I tell him that as I consider the work is according to the contract, it is my duty to keep on with the work, and as he considers it is not, it is his duty to stop the works, and I ask him to give me a written order to stop them until further notice, so that my employer and the architect may settle the matter; and I have found that most clerks of works are rather shy of maintaining their opinions to this extent.

With regard to delays, the principal cause I have found is that the detail drawings are not supplied at the same time as the contract, and a builder has to be cautious or he may find the architect make a variation and the material will then be thrown on his hands.

Coming to "Clerk of Works" remarks as to a

foreman not telling his employer or the office that the materials are not being delivered fast enough, I consider it one of the most essential parts of his duties, and when he finds it necessary to write on that point, to do so in a way there is no mistaking.

With regard to the setting out, I fully agree with him; the clerk of works is welcome to check the works when set out. Help in the actual setting out, I am afraid, would more likely prove a hindrance.

My own opinion is that the great mistake clerks of works make is that they start with the idea that the builder or his foreman is going to try and "have them"; if a suggestion is made, they look upon it as a kind of trap for them to fall into, and so act accordingly, and this it is which so often leads to friction.

CONTRACTOR'S AGENT.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

7.—SINKS: WASTES AND OVERFLOWS.

ON the common sink-of-all-work, the waste-outlet generally takes the form of a simple brass grate, the stone or freelay having a rebated hole, as shown in fig. 1, to receive it. A cup of lead (a), with a flange or rim at the top, is bedded in red-lead cement, and the brass grate (b), with the edge previously tinned, is then soldered to the flange of the cup; sometimes the grate is secured by pouring molten lead around it instead of by soldering. The lower end of the cup is soldered to the inlet of the lead trap. At one time glazed freelay grates and shanks were often used, but they are not as durable or as satisfactory in other respects as brass grates. The area of the openings in the grate ought to be at least equal to the area of the cross section of the trap and waste-pipe, so that these will be effectively cleansed by the flush of water. It is a good plan to place in every sink a small perforated metal strainer for the reception of garbage, such as tea-leaves and scraps of food, so that these do not choke the grate or the trap.

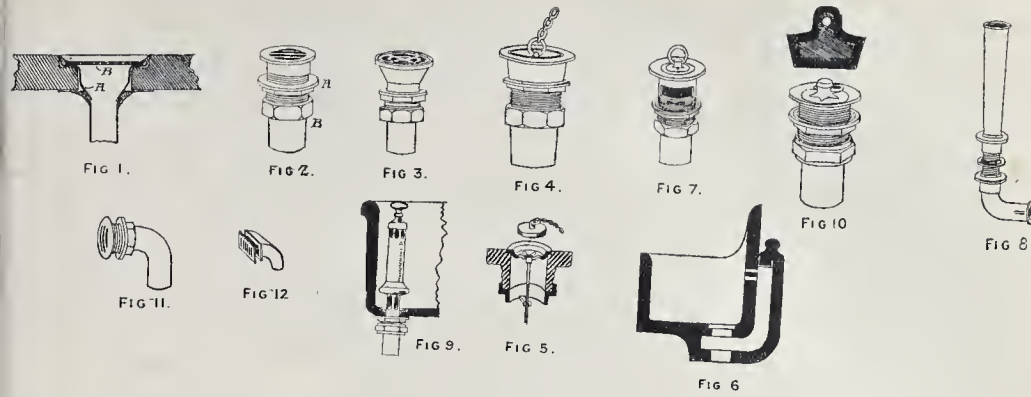
Another method of fixing the grate is by means of a brass coupling with fly-nut (a), as shown in fig. 2. The brass tail-piece (b), after being tinned, can be soldered to the inlet of the lead trap by an ordinary wiped joint. Fig. 3 is an improved form with enlarged grate; the dimensions are as follows:—Diameter over flange 3½ in., diameter over screw 2½ in., bore of union tail 1½ in.

Similar arrangements to those shown in figs 1 and 2 are often adopted for butlers' sinks, but the grating is placed at a lower level, so as to leave a socket above it for the reception of the plug. Fig. 4 shows an improved form of plug and washer for large sinks or baths; the diameter of the plug and grating is 3 in., diameter over flange 4½ in., diameter over screw 3½ in., and the outlet tail is either 3 in. bore throughout or tapered to 2½ in., the latter being preferable. If a tail-piece shown in fig. 5 may be used. Fig. 7 in our last article shows the common form of waste-plug for lead-lined sinks. For wood sinks, the flange of the washer is sometimes square and fixed with four screws, one at each angle.

In freelay sinks with overflows formed in the body of the ware itself, after the manner illustrated in fig. 6, page 118 ante, it is necessary to have an opening in the side of the brass washer to receive the overflow. Fig. 6 in the present illustrations is a section of Twyford's "Ruchill" hospital sink, showing the overflow in detail. This sink is made to stand clear of the wall and is glazed on the back. A loose enamelled freelay plug or cover is provided for the top of the overflow. The form of washer for such an arrangement is shown in fig. 7, with union for lead pipe. In the modification known as the "safety plug" the plug can be raised, but cannot be withdrawn; with this plug a pull-up arrangement is required, which, by a quarter-turn, will hold the plug some distance above the washer, so that the water can escape.

The waste and overflow shown in fig. 7, page 118 ante, are extremely simple, and can be easily kept clean. Of course, the same overflow can be used with an ordinary chain and plug instead of the spindle and safety plug shown in the illustration.

Combined wastes and overflows are now made in almost endless variety, but they are,



Illustrations to Student's Column.

as a rule, merely modifications of the old standing waste and overflow, of which the simplest form is shown in fig. 8. The vertical tube is made to fit into the washer of the waste-outlet, and so take the place of the plug. When the tube is in position and water is turned into the sink, the water will rise to the level of the top of the standing waste, and will then overflow down the standing waste to the waste-pipe below. A simple improvement consists in attaching the standing waste to a hook and knob above, so arranged that, when the knob is raised and slightly turned, a projection on the spindle passes into a corresponding socket or over a bar, and holds the standing waste clear of the grated outlet; by a backward turn of the knob, the waste is released and drops back into the washer.

Sometimes these standing wastes are concealed in small chambers formed at the back of the sink, but this arrangement cannot be recommended, as neither the chambers nor the standing wastes can be kept clean. The grease and other objectionable matters present in the water of sinks will soon render concealed parts of the apparatus extremely foul, and it is, therefore, highly desirable that standing wastes should be exposed to view, and should be easily detached for cleaning. A very good form of waste (Shank's "Simplex") is illustrated in fig. 9, which is adapted either for lavatories or sinks. To empty the basin, the standing waste is raised and slightly turned; a further turn will permit the waste to be taken out. If desired, the waste is furnished with a set-screw, so that it cannot be removed from the side; this arrangement is suitable for gymnasiums, schools, &c. Standing wastes are generally made of copper, brass, or gun-metal, and often have a rubber seating around the lower end to form a watertight joint with the washer. Porcelain standing wastes have also been made, and xylonite has recently been pressed into service. Porcelain and xylonite, however, will not stand rough usage, suitable though they may be in other respects; for this reason porcelain cannot be recommended, and xylonite only for lavatories in private houses, where they will be carefully used. They are, however, suitable for sinks.

Waste-plugs are generally of brass, carefully turned to fit the washer, but the weight of a plug of this kind is so great as to damage the enamel of the sink if the plug is allowed to drop upon it from some height. A slight improvement is effected by covering the plug with indiarubber, as shown in fig. 10. Plugs of solid indiarubber are better in this respect, are apt to get out of shape, and vulcanite is frequently used with satisfactory results. Plugs have the advantage of not forming a projection above the bottom of the sink. The size of the waste-plug and grate will tend to some extent upon the capacity of the sink, but the larger they are the quicker the water escape, and the better will be the scour through the trap and waste-pipe. As to the waste-pipes of sinks should not be less than 1 1/2 in. in diameter, and need not be more than 2 in. It is a good plan to have the trap and washer at least 1/2 in. more in diameter than the trap and waste-pipe, as the trap is more easily kept clean. This can be done by means of the tapering washers and tails

illustrated in figs. 3 and 4, or by using a washer and tail of larger size than the trap, and belling out the inlet of the trap as required.

Several kinds of overflow have already been described and illustrated, from the old-fashioned pottery overflow in fig. 3, page 118 *ante*, to the more modern forms of pottery overflows and of combined metal waste and overflows. Two simple overflows for connection with lead pipes are shown in figs. 11 and 12. In the former the joint is made tight by bedding the metal in suitable cement and screwing the metal in to the bent tail-piece; in the latter the grating is fixed with two screws to the back plate. These overflows and the pipes connected with them cannot be easily cleaned, and are therefore not as satisfactory as some of the other kinds which have been described.

GENERAL BUILDING NEWS.

TOWER, ST. MICHAEL'S CHURCH, BOURNEMOUTH.—On the 5th inst. Bishop Sumner dedicated a new tower which has been erected in connexion with St. Michael's Church, Bournemouth, at a cost of 5,000l. The tower has been placed in a nearly central position on the south side of the church, and in style is a rather late variety of Early English. A figure of St. Michael stands above the gabled entrance. The architect is Mr. J. Oldrid Scott, of London.

LEICESTER BOROUGH ASYLUM.—On the 7th inst. the new buildings of the Borough Asylum, which, exclusive of land, have been erected and furnished at a cost of 94,743l., were opened. The extension, which is to the east of the old building, and comprises a complete asylum for males, provides accommodation for 235 patients. The total number of beds now provided in the old and the new buildings is 855. Plans were prepared by Mr. Hine, of London, and Messrs. Moss & Sons, Limited, of Loughborough, obtained the building contract, and began the work in the autumn of 1897. Good progress was made till 1899, when the strike in the building trade hindered the erection of the superstructure. From an exterior point of view the buildings present no strikingly attractive feature. On the contrary, they are severely plain, the red brick being relieved only by a dressing of stone. There is, however, a peculiarity about their formation, the wards having been arranged in blocks in echelon, but as a continuous building, with a main corridor in the rear, giving a separate approach to each ward. The formation of the site, which slopes considerably to the south, made this arrangement necessary. It is by no means a disadvantage, as the whole of the wards look out on the south, and receive much more sunshine than would otherwise be the case. Centrally placed between the new and old asylums are the new administrative buildings comprising, on the north side, facing Gipsy-lane, an official block with a new principal entrance, and rooms for committee and officers. The stores, with an inclined sunk roadway for delivery of heavy goods to the basement, are between the entrance block and the kitchen and offices, and to the extreme south is the recreation hall, 84 ft. long by 44 ft. wide. Adjoining the recreation-hall is a small detached block, containing rooms for the assistant medical officers. Flanking the administrative buildings on either side is a corridor leading from the principal entrance, kitchen, stores, &c., to the several wards, that on the west side for the female asylum, and on the east side for the male asylum. Adjoining the male corridor is a complete suite of rooms for the male attendants, comprising a sitting-room, mess-room, and billiard-room, with a number of bed-

rooms over. To the north of the attendants' rooms is a large bakery, with a two-decker oven, and machinery driven by electricity. On the north side of the main corridor are the engineering workshop, comprising a boiler-house, containing three Lancashire boilers, 28 ft. long by 7 ft. diameter, engine-house, containing two direct driven dynamos for lighting the whole of the new buildings with electricity, a battery-room, with storage cells sufficient for providing light through the night; also engineers' workshops, smithy, coal store, &c. To the east of the boiler-house is the workshops' yard, surrounded by shops for plumbers, painters, carpenters, upholsterers, tailors, and cobblers, a bricklayers' shed, and an office and store for the clerk of works. The day rooms, dormitories, and corridors are warmed by ventilating radiators, and the ventilation is effected by means of extraction flues built in the walls and gathered up in the roof as chimneys. The single rooms are treated in a special way to prevent the patients from injuring themselves against any heated metal. In a room sunk below the level of the boiler-house is fixed a receiver which collected the condensed water from the whole apparatus. The electric installation has been carried out under the supervision of Mr. Colson, and comprises a total of over 1,000 16-candle power lamps and two motors, at a cost of about 4,000l. —*Leicester Post*.

CO-OPERATIVE PREMISES, EDINBURGH.—Premises for a drapery branch of St. Cuthbert's Co-operative Association have just been completed in Nicolson-street, Edinburgh. Mr. T. P. Marwick, of Edinburgh, was the architect.

ARDROSSAN AND SALTCOATS JOINT HOSPITAL.—A new infectious hospital has just been opened for the reception of patients at Springvale. The site lies about equi-distant from the centres of the Burghs, and is situated on the higher ground behind Saltcoats. The buildings are four in number, and are designed to accommodate nominally fourteen patients with the necessary staff; in the event of an epidemic, however, this number may be doubled without unduly crowding the wards. The administrative block provides accommodation for a matron, four nurses, and two servants, and has kitchen offices of sufficient size to do the culinary work for the whole establishment. The ward block is divided into three sections, thus allowing for the treatment of three distinct infectious diseases. Each set of wards has its own nurses' duty-room, bath-room, &c., and is entirely disconnected. The wards are well ventilated and heated by hot-water radiators in addition to the most modern description. The sanitary fittings are of the latest type. The laundry, wash-house and laundry, with drying-room attached; boiler-house, mortuary and visitors' room; ambulance-house and disinfecting-rooms. Connected to this building are the rooms where the patients are discharged, being bathed and supplied with clean clothing before leaving the premises. The porter's lodge, which is situated at the gates, is a compact little cottage, and controls the access to the grounds. The sewage is treated before leaving the site by the Septic Tank system, the apparatus being designed and supplied by the patentees, Messrs. Cameron, Commins, & Martin, of Exeter. The roads and paths leading to the various blocks have been formed, and the avenue leading to the site has been re-made. Lamps have been erected, and hydrants provided to cope with any outbreak of fire. The whole work has been carried out from the designs and under the direction of Messrs. Fryers & Penman, architects, Largs. The contractors for the various works were:—Brick work, Messrs. Greig Bros., Kilwinning; joiner work, Mr. Thomas Miller, Saltcoats; slater work, Messrs. Hogarth & Co., Ardrossan; plumber work, Mr. T. B. Stevenson, Ardrossan; plaster work, Messrs. Murray & McCallum, Salt-

coats; painter work, Messrs John Gillilan & Son, Adrossa; heating, Messrs. Boyd & Son, Paisley; disinfecting apparatus, The Reck Heating Company, Copenhagen; railings, gates, and lamps, Messrs. Frazer Bros., Largs. The clerk of works was Mr. James Potter, Largs.

VICTORIA HALL.—HALIFAX.—The new Victoria Hall, which occupies a position at the juncture of Commercial-street and Fountain-street, Halifax, has been erected from the designs of the architect, Mr. W. Clement Williams. The site was a difficult one to deal with, but the wedge-shaped end has been utilised for the principal entrance, and allows of a semicircular lecture theatre. The large hall is placed on the westerly side of the site, adjoining Powell-street, and the shop-premises front into Commercial-street on the easterly side. The stage, which is at the northerly end, will give full accommodation for a large orchestra as well as for the organ presented to the town by Miss Porter. Under the stage dressing-rooms have been placed for both sexes. The hall itself, and especially the ceiling, is of a highly decorated character, consisting of enriched panels of ornamental outline, and the leading spaces have been filled with processional groups of figures representing the Fine Arts. The large cove, which connects the ceiling proper with the wall line, is divided into panels filled with ornamental fibrous plaster medallions. The ranges of fluted pilasters face round the hall in the clearstory down to the balcony level. The gallery fronts are enriched with varied scroll work, supporting Cupids bearing panels on which are inscribed the names of the chief musicians and poets of the century. The proscenium consists of a large archway, having deeply recessed panelled soffits. One feature of the scheme is the mode of support of the galleries. The cantilever principle has been put into use, with the result that the necessity for pillars is quite obviated, while at the same time safety is assured. The floor of the area is supported on spiral springs, which, by a block arrangement into a solid floor. From the broad corridors, passing round the whole of the hall proper, there are seven entrances into each section of the hall, and connected also with the four curves of each corridor is a panic staircase communicating with no other portion of the premises. All the doors are made to open outwards, and are fitted with automatic locks. The whole area is fitted with concrete and steel. From the principal entrance a broad staircase ascends to the grand circles, with communication on either side of the area. The northerly side of the staircase landing is divided into open arcade work, pilastered and corbelled. The lecture theatre is approached from the grand staircase by two separate entrances, and both the large and the small halls may be used at the same time without interfering one with the other. Accommodation has been provided for a lounge and refreshment-rooms, cloakrooms, and other offices. There are eight lock-up shops, and a semicircular restaurant in the basement. The style of the building externally is English Renaissance. The building externally is English Renaissance. The contractors are as follows:—Mason and joiner, J. Charneck & Sons; plasterer and slater, J. Bancroft & Sons; plumbing and ornamental modelling, Jonas Binns & Sons, who also are the painters and decorators; electric lighting, H. Wright, who has worked under the scheme of Shepherd & Watney, electrical engineers, of Leeds; stained-glass dome, William Pape, Leeds; other ornamental work, Reuben Bennett, Manchester; concrete and terrazzo flooring, G. Greenwood & Sons; ventilators, W. Crossley; structural steel work, A. Handyside, Derby; mosaic pavement, Maw & Co., Salop. The accommodation of the hall is exactly 2,436.—Balcony, 750; area, 856; grand circle, 500; orchestra, 350. The lecture theatre will hold an additional 300. Twenty-one inches per person is allowed in the best seats, and 18 in. in the cheap seats. The total cost is about 30,000.—*Halifax Guardian.*

SANITARY AND ENGINEERING NEWS.

CARDIFF WESTERN SEWER.—The Borough Engineer of Cardiff (Mr. Harpur) has prepared the estimates required by Parliament showing the cost of the works proposed to be executed by the Corporation under their Bill for powers to construct new intercepting and other sewers for the purpose of discharging sewage into the sea at or near Lavernock Point. The total estimated cost of these works is 181,000, made up as follows:—intercepting sewer, 21,100; outfall sewer from the termination of the intercepting sewer to Lavernock Point, 103,070; two connecting sewers forming connexions with the intercepting sewer, 12,570; storm overflow sewer, 1,670; pumping station, engines, pumps, and buildings, 33,000; and land easements, 9,500. To meet this expenditure, including the cost of passing the scheme through Parliament, provision is made in the Bill to enable the Corporation to borrow any sum not exceeding 186,000.

MANCHESTER SHIP CANAL.—From the half-yearly Report of the Engineer to the Manchester Ship Canal (Mr. Henry Hunter), we learn that the depth of water in the canal and docks has been maintained

throughout, notwithstanding that, as a consequence of the excessive rainfall experienced during the half-year, exceptionally large quantities of sludge and detritus have been carried down and deposited in the canal and docks. Above Eastham Locks two dolphins, which are required for the berthing of vessels while being ballasted, are in course of construction on the easterly side of the canal. At Barton Coal Basin additional lines of railway, together with two weighbridges, have been laid down and are in use. One set of the spare steel gates for the 65 ft. locks on the canal has been completed and delivered at Barton. The additional roads and railways at the timber storage ground at Weaste have been completed and are in use. In the Manchester Docks, the curve which forms the junction between Salford Quay and No. 8 Dock is being faced with timber work so as to provide additional berthing space for vessels in the dock. The erection of new offices (1) at Trafford-road and (2) at the end of No. 1 Dock, for the staff engaged in the working of the docks and railways is proceeding. Considerable additions have been made to the railway sidings at the docks; a portion of the new railways on the Trafford Park side of Trafford Wharf-road has also been completed. A commencement has been made with the operations required for the dock and railway extension and other works under the provisions of the Company's Act of 1900, and the main road on the northerly boundary of the property recently acquired by the company are in course of construction; the permanent fence is also being erected, and the levelling of the ground for quay and storage space is in hand. The embankments and slopes of the canal generally are in good condition, and the works throughout the canal have been efficiently maintained.

AYLESBURY RURAL DISTRICT SEWERAGE.—A Local Government Board inquiry was held on Thursday, the 7th inst., at the Public Hall, Waddesdon, by Mr. F. H. Tulloch, M.Inst. C.E., one of the Inspectors of the Local Government Board, into the subject-matter of a petition presented to that board by the Aylesbury Rural District Council, to put in force a provisional order to acquire certain lands required by them for purpose of sewage disposal for the township of Waddesdon, the powers of the Land Clause Act with respect to the purchase and taking of lands otherwise than by agreement. The land in question was about three acres of glebe adjoining Quainton-road, of which the Rev. Dr. Yule, as Rector, is the life owner. Mr. Guest Luckett, engineer of Aylesbury, was present, and explained the scheme to the Inspector. On the following day a similar inquiry was held at Haddenham by the same Inspector. Mr. G. Luckett on this occasion was also present as engineer of the scheme, and explained the plans to the Inspector as on the previous day.

BOILERS FOR THE BUFFALO EXHIBITION.—The boiler plant of the Pan-American Exhibition which is to be held at Buffalo, U.S.A., from May 1 to November 1 this year, will be stationed in a separate building across the canal to the west of the machinery and transportation buildings, the steam main being brought under the bridge to the boiler-house. The steam will be furnished by four "Climax" water-tube boilers, built by the Crownrock Steam Boiler Company, Brooklyn, New York. These boilers will be about 13 ft. external diameter, will stand over 31 ft. high to the base of a 48 in. chimney stack, and will have a minimum evaporative capacity of 5,000 lbs. of water per hour each. They will be fired with natural gas, but will have the regular coal grates covered with fire brick, so that in case of failure of the gas supply the covering can be removed and the boiler run with coal without serious interruption to the service. The "Climax" boiler is now being built in this country by Messrs. B. R. Rowland & Co., Limited, Climax Works, Reddish, near Manchester, who are the sole manufacturers outside the United States.

SEWAGE OF RHOSLANERCHRUGOG, DENBIGH.—Colonel A. J. Hepper, R.E., Local Government Board Inspector, held an inquiry on the 8th inst. at the Public Hall, Rhoslanerchrugog, with reference to an application made by the Wrexham Rural District Council for a loan of 25,000 required for purposes of enlarging the Rhos sewage outfall. Mr. Erice Evans, engineer to the Council, gave evidence in support of the scheme.

FOREIGN.

FRANCE.—There is continued talk of the formation of a new Académie des Beaux-Arts outside of the Institut. The promoters of the scheme are MM. Gérôme, Bonquereau, Bonnat, Benjamin Constant, Mercier, Fremiet, Vaudremer, Chaplain, Cormon, and Dagnan-Bouveret. It is to number one hundred members, and is to include women, after the example of the old Académie Royale, of which Mme. Vigée-Lebrun and Mme. Rosalba were members.—The graceful building in the Boulevard des Capucines, known as the "Favillon Hanovre," is to be demolished.—The commemorative medal of the great Exhibition, intended for presentation to exhibitors, and which is designed by M. Chaplain, presents on the principal face a figure of Fame bearing on her wings a figure of Labour, and sailing over a panorama of

the Exhibition. On the reverse is a profile head of the Republic, with a view of the city of Paris as a background.—A statue to the celebrated philanthropist, Victor Considérant, is to be erected at Salins (Jura).—The demolition of the fortifications of Abbeville and enlargement of the ancient cathedral of Nice has just been completed.—Parliament has decided on building new hotels for the French Ambassadors at Vienna and at Washington.—The statue of a Parisian lady, by M. Moreau-Vauthier, which surmounted the entrance to the great Exhibition from the Place de la Concord, has been bought by a contractor concerned in the demolition of the buildings, who proposes to set it up in the public square of a small town in Cantal called Puy-Mary.—The death is announced, at the age of seventy-seven, of M. Louis Fabre, a former pupil of Constant Dufeux, and who was since 1866 a member of the Société Centrale des Architectes. He had been an inspector of works under the Paris Municipality, and had carried out numerous works in the provinces and in Paris, including a number of private houses at Neuilly-sur-Seine.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The well-known business of Mr. George Jennings, sanitary engineer, has been converted into a limited company under the style of "George Jennings, Limited," the share capital being taken up by members of the family or friends.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The usual meeting of this Society was held on the 8th inst., Mr. Alex. David presiding. The subject for the consideration of the members was "Wall Coverings," the lecturer, reading papers thereon, being Colin Sinclair, honorary secretary, discussed the subject of "Limes" and their application to wall surface, drawing special attention to the successful use of hydraulic lime plaster, as perfected by Mr. Alex. McAra, Glasgow, by his process in the preparation of Arden lime for this purpose. Mr. Robert W. Horn, A.R.I.B.A., confined his remarks to the use of "Gemeux" as plaster, and made clear in an interesting manner the various uses of "Bedford" in its numerous functions. A third branch of the subject, Mr. David Jackson, modeller, lectured on "Patent Plasters," speaking of such forms as Keene's, Robinson's, and Parisian cements, adamant, &c., and gave some useful information with regard to "Fibre" plaster and the casting of such, with special reference to its use in the Glasgow International Exhibition.

THE LONDON MANUAL.—The London Manual for 1901 (the fifth year of publication) contains much interesting and useful information concerning public bodies such as the London County Council, City Corporation, Boards of Guardians, Metropolitan Asylums Board, and the School Board. The work of the new Borough Councils is also described. The Manual, which is published by Edward Lloyd, Limited, Salisbury-square, appears to contain everything that is looked for in such a work. There are several small illustrations and maps in the issue.

ARBITRATION CASES.—At the Surveyors' Institution, Westminster, on the 6th inst., Mr. J. H. Clifton, arbitrator, concluded his inquiry as to their compensation to be paid by the London County Council for the property at Albert-square, on the south side of Commercial-road, E., which they had acquired as an open space under their General Powers Act of 1869. At the previous meeting evidence was taken from which it appeared that in 1869 the claimant, Mr. Morris Cohen, a mantle manufacturer, purchased the property at Albert-square, consisting of thirty-nine houses and the open square, for the sum of 22,000, or 1,000 more than was paid by the previous purchaser. Mr. Cohen, on obtaining possession of the property, proceeded to build workshops in the rear of the houses, and, as the demand for such premises was brisk at the East End, got an extra rental of 20l. per annum for each house. He was about to erect houses with workshops and shops on the square when the County Council obtained their compulsory powers. The claimant had been offered 37,500 for his property, but had declined the offer in view of its development. The value of the vacant land at Albert-square as a building estate was variously estimated by his witnesses—Mr. Haslock, architect, Mr. E. J. Housfield, surveyor, Mr. Douglas Young, surveyor, Mr. H. J. Dils, surveyor, and Mr. C. H. Moore, surveyor—at 10,500, to 17,187. The case of the County Council was opened by Mr. English Harrison, who contended that the valuations of the claimant's witnesses were greatly exaggerated. He called Mr. S. Walker, surveyor, whose estimate was 7,600; Mr. Farmer, surveyor (of Messrs. Debenham, Tevson, & Co.), whose estimate was 3,202; at the rate of 5s. per foot; Mr. Collins, surveyor, whose valuation was 7,920; and Mr. J. M. Knight, surveyor, who valued the open space at 7,497. The arbitrator, at the close of the proceedings, reserves his decision.—On the 31st ult., at the Surveyors' Institution, Mr. Ralph Clutton sat as arbitrator in the case of "Lord Guildford v. War Office," claim in respect of the compulsory acquisition of the War Department of 247 acres of frehold land

for military purposes. It was stated that the land in question formed part of Lord Guildford's estate, and was situated in the parishes of East Langdon, Guston, and St. Margaret-at-Cliffe, and within easy distance of Dover. Evidence on behalf of Lord Guildford was given by Mr. Alex. R. Stanning, F.R.I.B.A., Mr. George James Brown, F.S.I., and Mr. W. J. Jennings, F.S.I. For the War Office evidence was given by Sir William Crundall, Sir J. Whittaker Ellis, Bart., F.S.I., Mr. R. F. Granville, Mr. Cobb, F.S.I., and Mr. James Green, F.S.I. The owner's contention was that the land was of value as a possible building estate, an assertion which was denied by the War Office.

STREET IMPROVEMENTS, MAIDENHEAD.—Colonel W. Langton Coke recently held an inquiry on behalf of the Local Government Board in respect of the application of the Maidenhead Corporation for sanction for a loan of £9000 for street improvements. The Borough Surveyor (Mr. Percy Johns) gave evidence in support of the application. After several objections had been heard, the Inspector visited the various streets and localities proposed to be dealt with.

WIDENING OF HAMPESTEAD-ROAD.—A local committee held a public meeting, on the 11th inst., at Tolmer's-square Institute, Drummond-street, to consider the danger arising from the narrowness of Hampstead-road at the Euston-road. Dr. Collins, L.C.C., who presided, said the width of Hampstead-road at its southern outlet was only 33 ft. According to recent police returns, no fewer than 33,941 vehicles passed this spot between 8 a.m. and 12 midnight on a given date. The three lines and 12' width of the road was insufficient for the number of trams deposited thousands of passengers at that spot daily, and the danger was increased by the changing of horses. The question was affecting the welfare of London in general, and St. Pancras and North London in particular. The Mayor of St. Pancras moved a resolution declaring that the great and continuous increase of traffic rendered imperative the widening of the road at Hampstead-road. Of the 33 ft. of the thoroughfare, 18 ft. 6 in. were, he said, appropriated by trams, on either side of which omnibuses usually pulled up. The resolution, which was seconded by Mr. W. R. Cremer, M.P., and supported by Lord Elcho and Mr. Westacott, L.C.C., was adopted, with one dissentient. It was further resolved to bring the matter before the London County Council and the St. Pancras Borough Council, and to ascertain from London County Council candidates their views upon the subject.

THE PROPOSED RESTORATION OF LINLITHGOW PALACE.—Mr. Ross, of the firm of Messrs. H. Gibson Ross, architects, Edinburgh, who has had a life-long practical acquaintance with Linlithgow Palace, is of opinion that it could be restored in keeping with the other parts of the building at a cost of, say, about £40,000. He suggests that it should be converted into a great national institution, such as a museum or a library. "I have before now," he says, "urged the advisability of restoring Linlithgow Palace, and that for many reasons. First of all, that it is not in such a desperate state of ruin but that it could be easily restored to its original condition. Nothing else would preserve it but to place a roof upon it. As history records, in 1746 it was set fire to by Hawley's Dragoons, who were quartered in the Palace after the battle of Falkirk of that date. Up till then the Palace was in constant occupation. As the birthplace of Queen Mary, there is undoubtedly great appropriateness in the suggestion for its restoration as a memorial of a still greater Queen, and of a Queen about whose history there can be no cavil or dispute. Of course, the building, when restored, would not be suitable, owing to its situation, as a Royal residence, but still it could be used as an institution of the kind already suggested. Being situated mid-way between Edinburgh and Glasgow, there could be no rivalry between the two cities as to which city it belonged, and consequently, the rivalry being eliminated, it might become a very favourite Scottish institution. Some of the large apartments, especially the great hall, erroneously termed the Parliament Hall, would be one of the most magnificent rooms in Scotland. The Domestic Chapel is also a place of singular interest. It is by far and away the finest of the kind in Scotland. In fact, the Palace might be made a place to illustrate the medieval history of Scotland."—*Dundee Advertiser*.

BRITISH FIRE PREVENTION COMMITTEE.—At the monthly meeting of the executive of the British Fire Prevention Committee the death of her Majesty the late Queen was referred to in fitting terms, and it was proposed by Mr. Edwin O. Sachs (chairman of the executive) and seconded by Mr. F. R. Barron (chairman of the commercial section) and unanimously carried, that, "The executive of the British Fire Prevention Committee representing some 500 architects, engineers, municipal officers, and other professionally interested in fire prevention and research desire to offer their sincere condolences to his Majesty the King on the great sorrow sustained in the death of their late beloved sovereign, Queen Victoria. The executive further desire respectfully to assure his Majesty of their unwavering loyalty and devotion to the Throne."

MUNICIPAL HOUSE BUILDING IN SHEFFIELD.—The following item appears on the minutes of the Health Committee of the Sheffield Corporation:—"The City Surveyor reported that ten of the cottages

in Hands-lane were ready for occupation, and that five more would be ready in a few days. He also reported that the cost of cottages, including land, erection, street works, and incidental expenses, would be approximately as follows:—

	Estimate.	Approximate total cost.
	£ s. d.	£ s. d.
Land.....	.....	714 12 0
Contract work.....	1,856 15 4	
Increased (through contractors having declined to carry out tenders).....	2,020 14 6	
Building wages, &c., done and lock-out of operative bricklayers.....	2,750 0 0	2,751 5 7
Printing, clerk of works' wages, street works, &c.,.....	.....	306 18 2
		£5,793 10 3

Resolved, that the Tramways Committee be requested to lend to the Health Committee a sum of £800, the amount required, in addition to the £5000 already lent by them, for the cost of the erection of the Hands-lane cottages, on the same terms as to interest and period for repayment as the £5000.

THE SANITARY INSPECTORS' ASSOCIATION.—In consequence of further unavoidable circumstances, the annual dinner of this Association has been postponed to March 15. It will be held at the Venetian Chamber, Holborn Restaurant.

CAPITAL AND LABOUR.

THE NORTHERN BUILDING TRADE DISPUTE.—The Northern Centre of the National Federation of Building Trades Employers and the London Order of Operative Bricklayers have agreed to submit the matters in dispute at several of the centres of the industry to arbitration. An agreement to this effect has been made as follows:—"Memorandum of an agreement made between the Executive Council of the Northern Centre of the National Federation of Building Trades Employers of Great Britain and Ireland and the Executive Council of the London Order of Operative Bricklayers for the settlement of the strike and lock-out of operative bricklayers in Newcastle-on-Tyne, Gateshead, and district and the Northern Counties Federation district. It is hereby agreed that the dispute between the employers and operative bricklayers at Newcastle-on-Tyne, Gateshead, and district shall be submitted to the arbitration of two gentlemen, one each of which shall be appointed by the respective parties hereto, and in the event of the two gentlemen nominated being unable to come to an agreement they shall have power to appoint a referee, whose decision shall be final and binding on both parties; and it is hereby further agreed that in the event of the two arbitrators being unable to agree upon a referee the President of the Board of Trade shall be respectfully asked to nominate one at the request of both parties to this agreement. The arbitrators' award to be given within a fortnight of the date of signing this agreement, or at such subsequent early date as they the arbitrators may fix. It is further agreed that all the union operative bricklayers shall return to work in all the northern towns affected immediately the arbitrators' award is given, those in Newcastle-on-Tyne, Gateshead, and district on the terms of the award, and those in the other towns affected on the rules and rates of wages in force prior to the lock-out." Since the signing of the agreement by the chairman and secretary of the respective parties it has been practically arranged that one arbitrator shall be accepted, to be nominated by the President of the Board of Trade at the request of both parties.

SHEFFIELD CORPORATION AND THE PLUMBERS DISPUTE.—The Sheffield Corporation Water Department are going to pay the plumbers in their employ the 9½d. per hour asked for, on the condition that they accept the new proposals in regard to walking time and winter hours. Originally the men demanded 9½d. per hour—an increase of 3d.—without any conditions, but later the employers suggested certain new rates, the most important of which were that within a radius of 1½ miles of the parish church, or 2 miles of the workshop, no walking time should be allowed, and that the rule fixing 49½ hours as the working week throughout the year should be so varied that during the four winter months it should be 47 hours.—*Sheffield Telegraph*.

PERTH JOINERS' WAGES.—Perth operative joiners have received notice from the masters that on and after April 1 the wages will be reduced from 8½d. to 7½d. per hour.

THE DUNDEE BUILDING TRADE.—A conference took place on the 8th inst. in Dundee between the Master Builders' Association and the Operatives' Association regarding a proposed reduction of wages. The men's wages at present are 8½d. per hour, and both committees recommended a reduction of 3d. per hour, commencing on February 16, with no further change till the end of May, when a new agreement could be considered.

PENRYN QUARRIES.—Negotiations are being carried on between the managers and the men, but we do not think it probable that the latter will resume work.

LEGAL.

BUILDING DISPUTE AT SOUTH SHIELDS.

The case of the Mayor and Corporation of South Shields v. Wilson Brothers came before a Divisional Court of King's Bench, composed of Justices Wills and Channell, on the 7th inst., on appeal from a decision of the Justices of South Shields, who decided in favour of the defendants.

Mr. Ralph Bankes appeared for the appellants, the Mayor and Corporation of South Shields; the defendants were not represented.

The case came before the Court in the form of a special case stated, from which it appeared that a complaint had been brought before the Justices on behalf of the Mayor and Corporation of South Shields against Messrs. Wilson Brothers, that they had unlawfully erected a "new building" in Redhead-street in the borough without having first given fourteen days' notice in writing to the Corporation, and not having delivered to their surveyor plans thereof, contrary to the by-laws of the borough. Upon the hearing of the complaint the following facts were either proved or admitted by both parties: The defendants were the owners of a piece of ground of about an acre in extent in Redhead-street. It was boarded on every side, and occupied in part by a veterinary surgeon, who had an office, a stable, and some other wooden erections for his business. The defendants also occupied other parts of the ground as a builder's yard, and near the centre of the ground the defendants had an open shed. Against this shed the defendants put up the wooden erection complained of. It was of no great size, being under 20 ft. each way, and at the apex of the slanting roof only 12 ft. high. The public had no access to it, and it was to all intents and purposes in the enclosed private ground of the defendants, and was intended for a stable. On the part of the appellants it was contended that the wooden erection complained of required plans to have been delivered to the Corporation, which had to be approved of by the Corporation before the defendants commenced to build, and this the defendants had not done. The defendants' contention was that it had never been the custom of the Corporation to require any plans for wooden-built stables to be submitted to them; that the by-laws had not been insisted upon in such a case previously; and further that the by-laws did not apply to such a case as the present. The Justices, before deciding the case, surveyed the erection and its surroundings, when they held that the by-laws did not apply to a stable built of wood upon enclosed ground, as in the present case. In the opinion of the Justices, "a building to be a building within the meaning of the by-laws should answer to the description of an edifice having some approach to architectural design and structurally fit and intended for use and occupation by humanity in a civilised form." They therefore held that the structure in question was not a "building" within the meaning of the by-laws, and that no question of law arose in the case.

At the conclusion of the argument of counsel, their lordships held that the structure in question did come within the meaning of the by-laws, and remitted the case to the Justices, directing them to convict the defendants.

The appeal was accordingly allowed.

CENTRAL LONDON RAILWAY AND SUBSIDENCES.

The case of the Trustees of Mrs. M. Cunliffe v. the Central London Railway came again before Mr. J. W. Penfold, F.R.I.B.A., sitting as sole arbitrator, at the Surveyors' Institution on the 8th inst. The case is one in which damages to the extent of £4,800 are claimed against the Central London Railway for alleged damage to No. 2, Lancaster Gate, Bayswater-road, caused by subsidence of the soil consequent upon the construction of the railways.—Mr. A. G. Mantou, C.E., chief agent to the contractor, in giving evidence on behalf of the company, said it was his opinion that the subsidence was due to the bursting of a water main belonging to the East London Water Company. It was quite impossible that the railway could have had anything to do with it. The house was built upon a layer of mud, and any considerable stream of water, such as would result from the bursting of a large water-pipe, would certainly tend to shift the foundations and ultimately to cause the cracks complained of.—Sir Douglas Fox also gave evidence for the railway company. He said the method of the construction of the tunnel of the Central London and similar railways was such as to preclude all possibility of overhead subsidence. After the Greathead shield had cut its way, and the iron lining plates fixed in position, the inch and a half of space remaining between the plates and the soil of the tunnel was immediately filled with a clayey composition injected through the plates, so that the whole was as firm and compact as before. Subsidence was in that way rendered impossible. He had watched the construction of the railway for the Mercers' Hall and the Royal Exchange, and he had found out that any subsidences that occurred invariably took place some time before the spot was reached by the work-

men, and that no movement occurred subsequently. Even then the cracks were only "hair cracks." He concluded that for the tunnel to have affected the house the damage must have been done in the autumn of 1897, whereas it did not take place till much later. As the house was built upon the valley of a once-existing brook, the ground, if it became saturated by water from a burst water-main, would certainly give way and cause cracks in the houses above. Another reason which made him believe that the tube had not affected the house was that a 6-ft. sewer which ran between the house and the railway was quite intact. The construction of vertical shafts for stations very often caused subsidences in the adjacent buildings, but as No. 2, Lancaster Gate was 440 ft. from a station, this cause was extremely unlikely.

Mr. J. Seaton, the resident engineer, gave corroborative evidence, and the case was adjourned provisionally until March 1.

ACTION BY A SCENIC ARTIST.

THE case of Ryan v. the Portsmouth Theatre, Limited, came before Mr. Justice Bigham, sitting without a jury, in the King's Bench Division on the 11th inst. It was an action brought by the plaintiff, Mr. Thomas Edward Ryan, a scenic artist, to recover from the defendants 73*l.* 11*s.* 10*d.*, his fees for an act drop representing the ship *Victory* being towed into port, and which he alleged was executed by him to the order of the defendants' managing director.

It appeared that the price agreed on for the act drop was 50*l.*, and that the plaintiff made a sketch which was submitted to Mr. Matcham, the defendants' architect. The plaintiff, to complete the work, obtained the assistance of Mr. T. T. White, who painted the figures at a cost of 20*l.*, which the plaintiff paid. The act drop had been used at the defendants' theatre from August 6 down to the present time, but defendants refused to pay the full price for it on the grounds that it was not according to the instructions given by their architect, and that the architect had not given a certificate for the work. The defendants paid 58*l.* 11*s.* 10*d.* into Court as being sufficient to satisfy the plaintiff's claim.

For the defence, Mr. F. Matcham, defendants' architect, in giving evidence said he told the plaintiff he wanted three or four fair-like figures, with wreaths of roses and other flowers, attached to the bow of the ship *Victory*, towing the ship into port. He wanted Britannia at the side, drawing the drapery back and disclosing the picture. The plaintiff said it was a good idea. The plaintiff did not say it could not be done. He did not approve of either of the sketches, neither did he approve of the "act drop," and suggested alterations—namely, other figures to be added. The plaintiff intimated that he would do that and do his best to make it comply with his wishes. He did not think that the act drop as executed carried out his ideas, and he refused to certify that it was done to his satisfaction.

In the result judgment was entered for the plaintiff for 15*l.* beyond the amount paid into court, with costs.

Mr. Stephen Lynch appeared for the plaintiff, and Mr. Emanuel for the defendants.

BREACH OF CONTRACT.

[NORTHERN CIRCUIT.]

MESSRS. NEILL & SONS, builders, of Manchester, brought an action recently to recover damages for breach of contract from Mr. Hamor Lockwood, a contractor. Mr. C. A. Russell, K.C., and Mr. Gilbert Jordan appeared for the plaintiff, and Mr. Pickford, K.C., and Mr. Langdon for the defendant. A watching brief for an insurance company was held by Mr. Acton. From the statements of counsel it appeared that the plaintiffs, who were builders in Manchester, entered into a contract with the Lancashire and Yorkshire Railway Company for the construction of certain works, and relet a portion of the asphalt work to the defendant, a contractor in Manchester, under a sub-contract. In the specifications and conditions attached to the sub-contract there was a clause stipulating that the defendant should include in his tender insurance of the workmen employed by him, there being a condition that the plaintiffs were not to be responsible for any accident which might befall any of the defendant's workmen. During the execution of the work an employee of the defendant's was injured and died. A claim was made by his widow under the Workmen's Compensation Act, 1897, and both the plaintiffs and defendant were made parties to the action, which came before Judge Parry, of the Manchester County Court, sitting as arbitrator. Judge Parry, following a decision of the Court of Appeal, which laid down that a sub-contractor was not an "undertaker" within the Act, awarded the widow 234*l.* damages against the present plaintiffs and dismissed the case as against the present defendant. The plaintiffs now sought to recover that sum, together with 21*l.*, the costs of the arbitration, from the defendant. Mr. Russell argued on behalf of the plaintiffs that the defendant was bound to indemnify them against any claim for damages for

injuries sustained by the defendant's workmen. For the defence it was submitted that the defendant, in taking out a policy of insurance, had fulfilled his obligations under the clause in question, and that there was no contract to indemnify the plaintiffs against damages in any accident which might be brought against them. In the course of his judgment the learned Judge said that he was of opinion that the clause in question was inserted for the protection of the plaintiffs with the object of throwing upon the defendant the obligation to discharge any claims which might be brought against the plaintiffs by any of the defendant's workmen. He thought that the intention of a clause was that the defendant was to take out a policy under which the insurance company would be responsible for any claim brought against either the plaintiffs or the defendant by the defendant's workmen. Such intention was, he considered, sufficiently shown by the words in the contract, "it being a condition that we are not responsible for any accident occurring to your workmen." The meaning of this clause was clearly that the defendant should take such steps as would prevent any liability falling upon the plaintiffs in respect of any accident happening to the defendant's workmen. There would be judgment for the plaintiffs for the amount claimed, with costs. A stay of execution was applied for by Mr. Pickford, and granted.—*Times*.

BUILDING CONTRACT: ARCHITECT'S CERTIFICATE: NOTICE TO TREAT.

IN the Official Referee's Court, on the 6th inst., before Mr. Verey, the case of Lole and Lightfoot v. Vidal was heard. This was an action brought by the plaintiffs, a firm of builders at Chelsea, to recover 485*l.* 10*s.*, and loss of profit on a building contract, and raising the question of whether architects' certificates should be issued after a notice to treat had been served on the owner.

Mr. Morton Smith appeared for the plaintiffs; the defendant, who conducted his own case, had paid 500*l.* into Court.

Mr. Morton Smith said that in the latter part of 1899 negotiations took place between the plaintiffs and defendant as to rebuilding No. 51, Shaftesbury-avenue, and other premises in Wardour-street. The defendant ultimately accepted the plaintiffs' tender of 610*l.* for the work, but afterwards altered his view as to what was required to be done, and on March 22, 1900, the parties entered into another contract for 872*l.*, including an addenda which contained priced items commencing with the 610*l.* The contract contained clauses stipulating that when, in the opinion of the defendant's architect, work to the value of 200*l.* was done, the contractor should be entitled to be paid at the rate of 85 per cent., that the defendant's architect should give certificates from time to time, and that after a stoppage for a month the contract could be determined. On April 2 the architect, Mr. J. A. Soutar, authorised the builders to proceed, and they pulled down and cleared away the wall next Wardour-street, the defendant agreeing to pay 50*l.* for it, as the architect thought the work necessary. On April 17 both the architect and the defendant wrote to the builders directing the work to be stopped, and a notice to treat had been served on the defendant by the Strand Board of Works, the land being required for widening the street. In consequence the builders stopped at once, but the plant and materials were left on the site for about six weeks. On May 3 the builders applied for payment of 485*l.* 12*s.*, being the account rendered for work executed up to the date of the stoppage of the work. The works having been stopped one month and no further orders to proceed given, the contract was determined. On May 24 the defendant's solicitors wrote informing them that items in their claim were not covered by the architect's certificate, and mentioning the compensation claim against the Strand Board of Works. The builders replied that the compensation claim had nothing to do with them, and required payment by the architect's certificate. On June 25 the architect made out a certificate for 250*l.* (including 50*l.* for the wall), and again, on July 20, gave a final certificate for 200*l.* intimating also that any claim for loss of profit by non-completion of the contract was not within his province. The defendant declined to pay for loss of profit; and thereupon the plaintiffs brought this action. The job was an awkward one to do, as the land was only 3 ft. in depth and 48 ft. in length, and therefore, in estimating for work of this kind, a builder would look for a larger profit than he would in other work, because of the extraordinary amount of risk and difficulty which he would have, and the plaintiffs had put this profit at 15 per cent. on 572*l.*, or 85*l.* 10*s.* In the certificates of 350*l.* was included the 50*l.* authorised by the defendant for the party wall.—Mr. Wm. Chas. Lole, a member of the plaintiff firm, bore out the counsel's opening statement, and said the minimum profit would be 15 per cent.—Mr. Henry F. Williams, surveyor, Fleet-street, E.C., agreed that 15 per cent. was a reasonable profit for a builder to expect for work of this character.—Mr. J. A. Soutar, architect, Bishopsgate-street Within, said he was employed in the matter by Mr. Vidal, and exercised his judgment on the amount of work actually done. He obtained the schedule of

prices from the builders as to how they arrived at the 610*l.* He arrived at the opinion that 350*l.* was a fair contract price for the work done, leaving 572*l.* for work under the contract not carried out. A builder would expect 15 per cent. profit on an awkward job like that. The building was up to the ground floor.—The Official Referee said the certificates were binding upon him, unless fraud and dishonesty were proved.—Other evidence having been given, the Official Referee held that the clause stipulating that the builders could not claim loss of profit if they determined the contract did not apply. He gave judgment for the amount certified by the architect, 350*l.*, and for loss of profit at 12½ per cent., 71*l.* 15*s.*, with costs.—*Estates Gazette*.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,432.—AUTOMATIC WATER SUPPLY FOR WATER-CLOSETS: R. C. Grundy, D. R. Grundy, and D. Grundy.—For supplying water in fixed quantities; the valve casing into which the supply pipe enters has an inlet and a discharge valve worked by a weighted lever that is raised or lowered by the seat of the closet, and is joined to the spindle of the outlet valve; water will flow through a pipe into a container when the inlet valve is lifted through the engagement of its spindle with the extended spindle of the outlet valve as the latter is pressed against its seating; water flows into the closet upon the opening of the outlet valve, which depresses and shuts the inlet valve; the latter valve is disposed adjustably upon its spindle, and its conical shape is intended to obviate the deposit of dust and dirt; escape of air is provided for by means of an adjustable float-valve fitted upon the container, which also has a funnel-shaped opening for the prevention of overflow; the container is admitted through a spring or weight-balanced valve at the top of the container.

20,435.—LINING-PLATES FOR BRICK MOULDS: J. E. Brindley and F. Rowley.—The lining-plates are made of some such hard substance as porcelain, stone, steel, or glass, and are fastened to one another in their places around the die or plunger so as to form a frame to be placed within a flanged casing made of cast-iron, to which they are cemented, the cement interlocking with projections and recesses fashioned upon the lining-plates.

20,437.—A CONTRIVANCE FOR USE WITH LATCHES AND LOCKS: D. Beards.—The cap or back-plate is secured to the body of a lock or latch-case by lugs upon the plate, which will pass through holes cut in the fore-end; at the back of the case is another lug, which is clinched over after it has been inserted through a hole at the edge of the plate; if the fore-end does not pass through a hole or holes in the plate, and the plate-lugs will then pass into holes made in the back of the case; in another form the lugs and holes are set on opposite sides, instead of at the ends, of the plate.

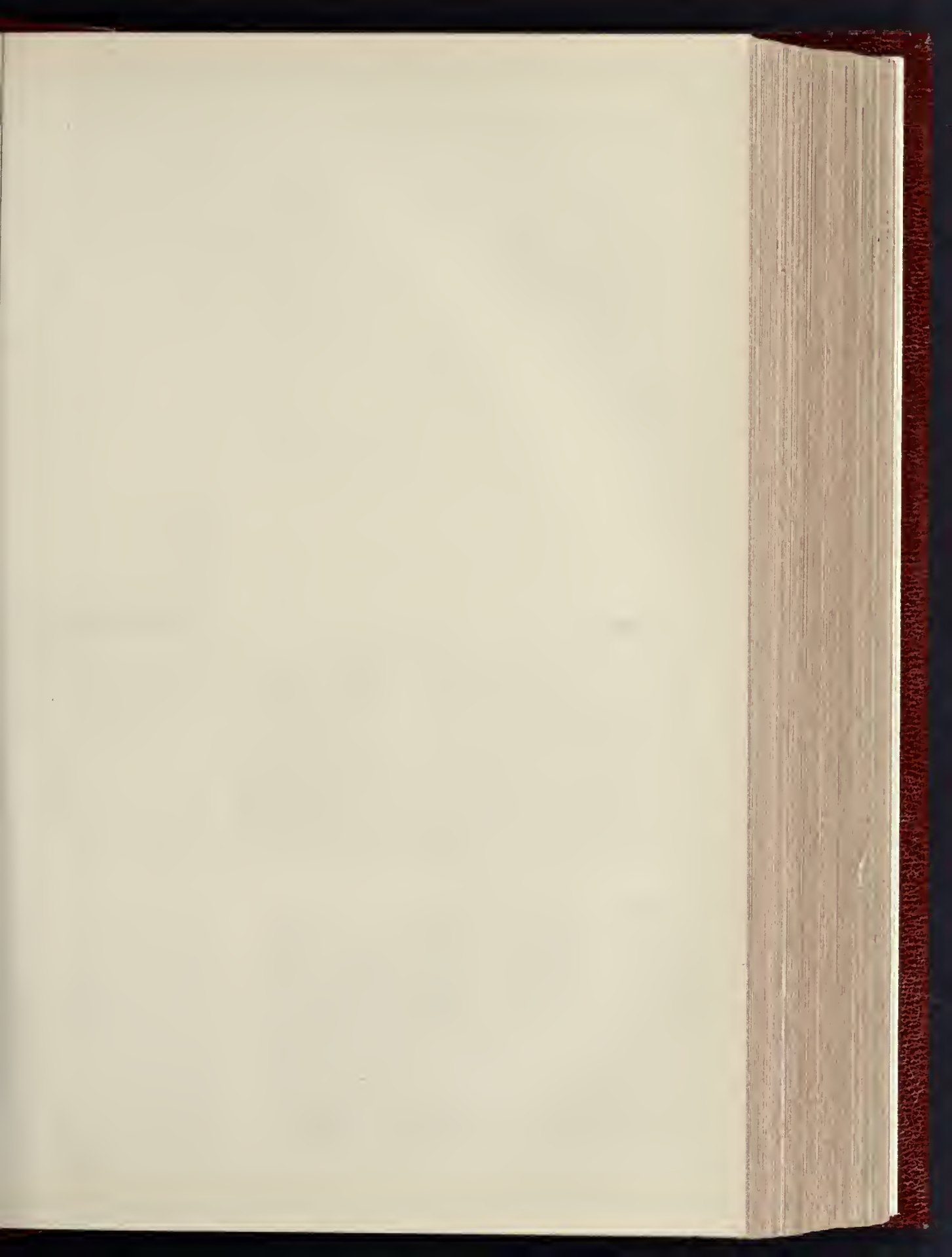
20,460.—SHEET-ROOFING: C. H. Windle and B. D. Meares.—Hooks or clips that are bolted on to the purlins are employed for fastening corrugated metal roofing sheets in their position, the upper edge of each sheet being placed between the hook and the purlin, and the lower overlapping edge of the sheet immediately above being inserted underneath a round purlin which extends from the hook.

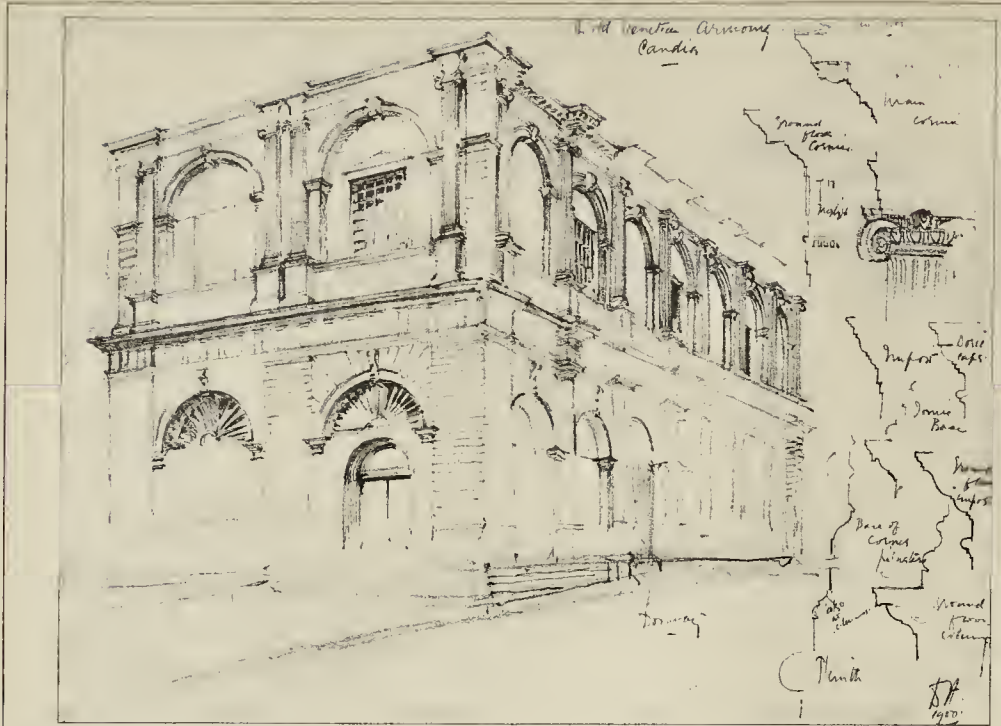
20,470.—SIPHONICAL DISCHARGE: C. D. Martin.—The flush is started through the forcing down of water over the crown of the siphon by means of the fall of a piston within a cylinder, which is fitted in the top of a flattened receiver, at the bottom of which is a non-return valve, and into the top of which the shorter leg of the siphon is introduced. A silent discharge and the collection of dirt between the cylinder and its piston are prevented by means of a ring around the top of the cylinder.

20,480.—ELECTRICAL SWITCHES AND CUT-OUTS: A. Faray.—Metal bushings are sunk below the surface of each distribution board in such a manner that they cannot be touched and in such a manner that fit in deep grooves cut in the face of the board, the bushings being connected to insulating handles and connecting the plug terminals constitute the simple fuses; for the switches the fuse is connected to one of the plugs and to one of the contacts, the other plug being connected to the other contact.

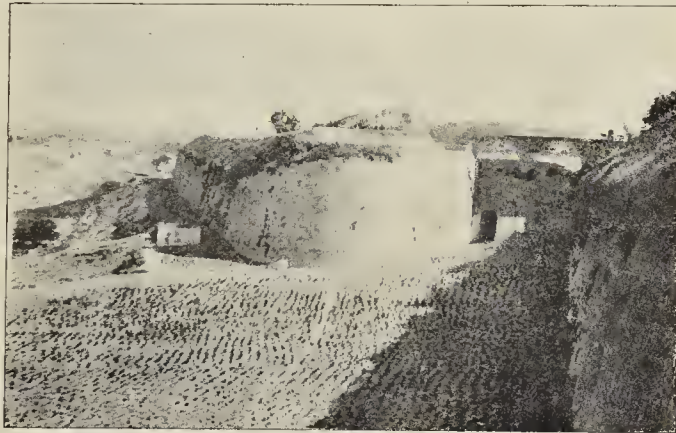
20,489.—BRICKS AND BLOCKS FOR BUILDERS USE: S. Ritter von Blönski.—The bricks and blocks, moulded in various suitable shapes, are intended for floors, ceilings, arches, walls, conduits, paving, foundations, and so on; they are hollow and are to be joined together with their interlocking grooves and tongues and hollow or solid cores that will pass into two or more bricks. The bricks should be vitrified or baked into clinkers when they are required for the building of vaults and floors, and the passage through them will serve for the drainage of water, the circulation of air, and the conveyance of smoke.

20,492.—PERCUSSIVE ROCK-DRILLS: R. Avery and H. C. Campbell.—A clamp between adjustable collars forms the mounting upon a standard of the casing in which the drill that is to be struck with hammers is held and turned, the drill passes through split bushes in the ends of the casing, which consists of two parts screwed together, and it is gripped between pawls pivoted upon a sleeve by means





VENETIAN ARMOURY, CANDIA.



EXTERIOR OF LAZARETTO GATE, CANDIA.



KAINOURY



BACK OF THE ARMOURY, CANDIA.



LAZARETTO



HOUSE AT KNOSSOS.



...E, CANDIA.



VENETIAN STONE FOUNTAIN, CANDIA.

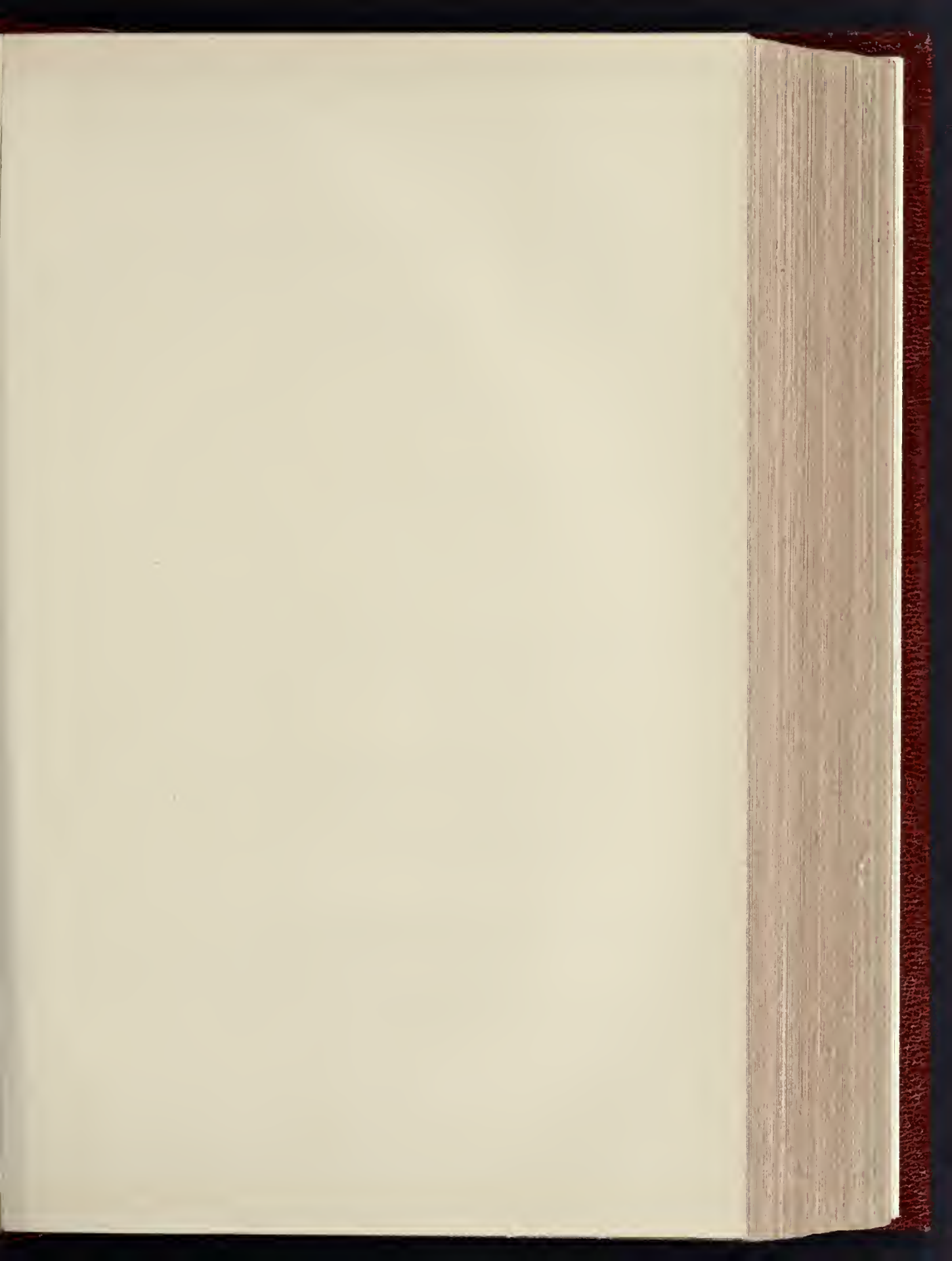


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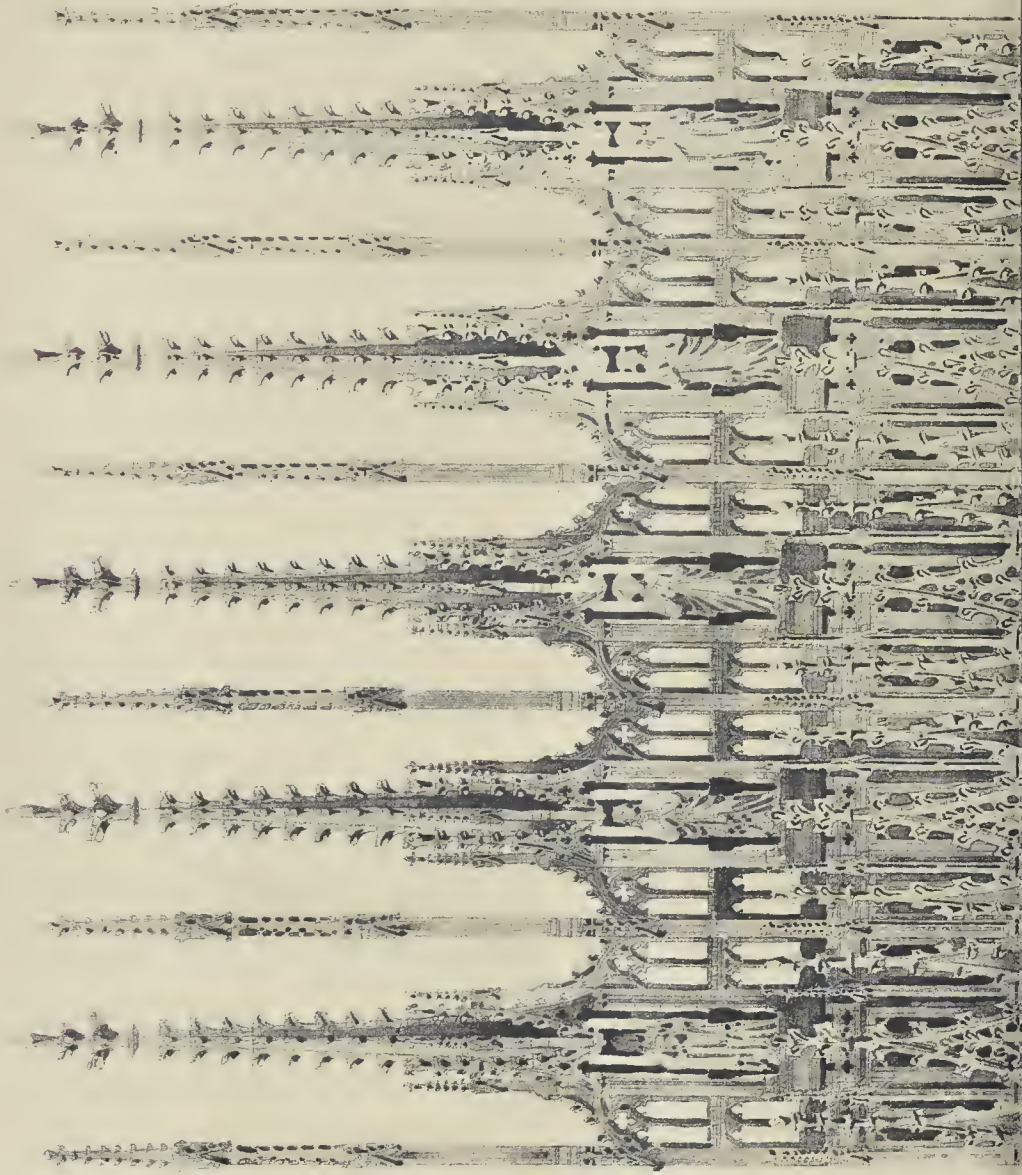


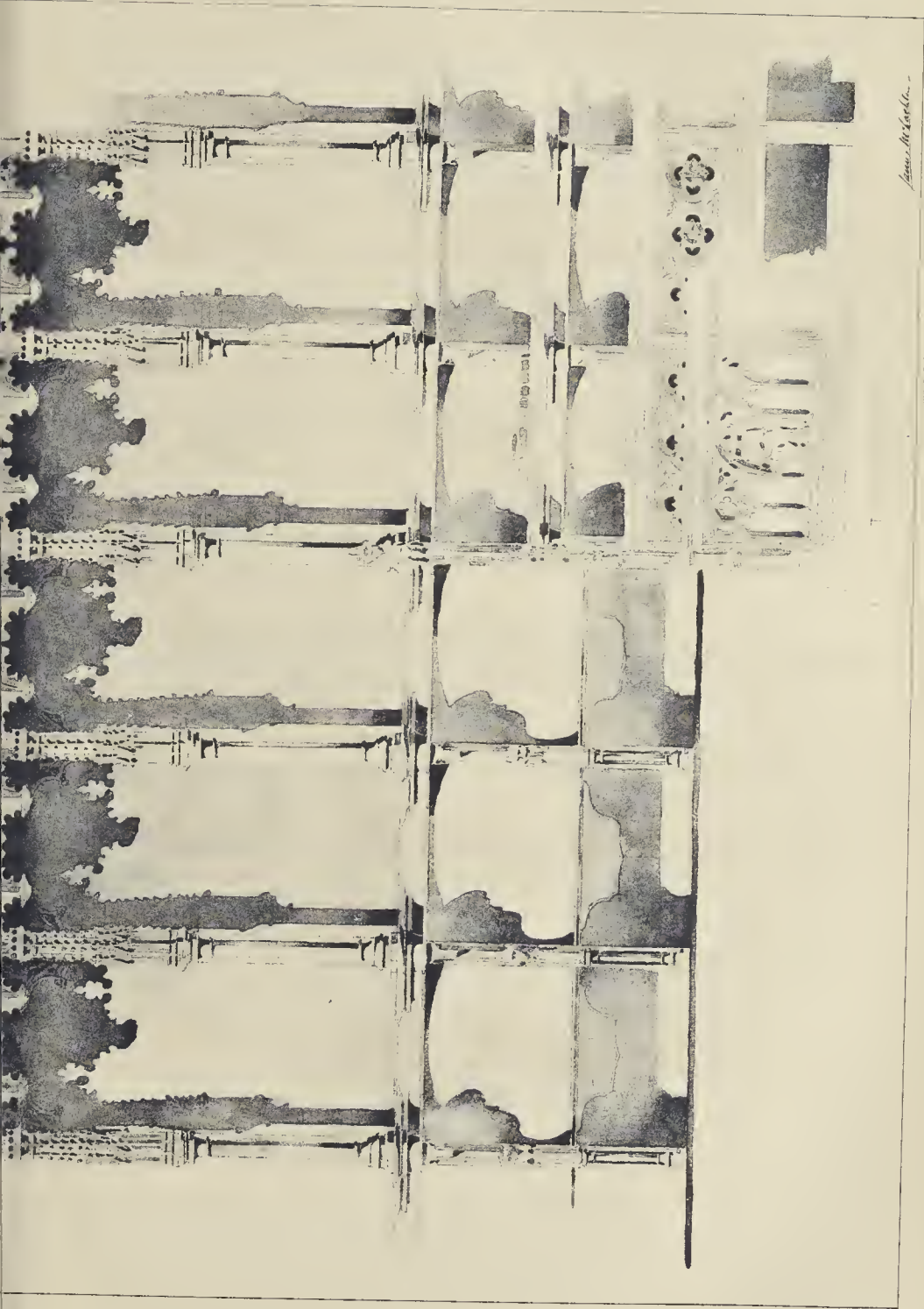
TURKISH ARCHES, CANDIA.

INK: PHOTO SPRAGUE & CO. LTD. 4 & 5, EAST HARGING STREET FETTER LANE, E.C.



THE BUILDER, FEBRUARY 16, 1901.





INK PHOTO SPRAGUE & CO., LTD., 4 & 5, EAST HARDING STREET, LONDON, E.C.

CHOIR STALLS, LINCOLN CATHEDRAL.—DRAWN BY MR. JAMES McLACHLAN. (Pugin Student, R.I.B.A.)

of a spring, whilst another pawl, carried on a ring, operates a sleeve upon which are sliding lugs that turn the former sleeve in order to turn the drill; the drill can be raised clear of the end of the hole when it is turned by means of ratchet teeth on the latter sleeve that engage with teeth upon a plate so as to force the plate backwards upon the pivoted pawls and make them hold and raise the bit.

20,505.—CHIP-AND-SLEEVE AND BUTT-AND-FLANGE JOINTS FOR PIPES: D. H. Nesbit.—The couplings or joints are intended for metal tubes and pipes which have tapered ends for collars and rings, the joints being tightened by the bolting together of other collars. A projecting lip or ring upon one collar will engage with a groove in the opposite collar and so secure the jointing washer. The tube ends may be expanded or riveted over so as to fit into recesses made in the faces of the collars, or the collars may be screwed. By another method of coupling, a loose collar or ringed flange, which is fashioned with an interrupted boss, will fit with an interrupted collar or shoulder upon the end of the pipe.

20,518.—AN ARTIFICIAL MARBLE: S. Weill.—A paste is made by stirring together water, glycerine, and white English marble cement, to which is added an earthy colouring substance mixed with smoothed stone, and then, having been dried again, a smoothed with whetstone, stopped, and smoothed over with a polishing stone. They are next soaked in olive oil and well polished. For a hard one-tinted marble an admixture of cinder dust, white English marble cement, glycerine, water, and colouring matter should be used.

20,557.—AN APPLIANCE FOR DISC MILLS FOR GRINDING LIME, ASHES, SANDSTONE, &c.: F. E. Whitham.—The grinding mills are provided with a balancing contrivance that consists of two, or three, rings, which have a channel-shaped section and are placed adjustably around the span of the runner, or, it may be, upon the stone, lime, &c.; wooden packing rings effect the vertical adjustment of the balancing rings, which are made solid throughout their greater part in each instance.

20,585.—A LOWERING APPARATUS FOR ESCAPE FROM FIRE: F. E. Young.—The apparatus, which was a liquid brake, comprises a drum or reel that is mounted within a window frame or a similar fitting, and is made in two portions upon which the ropes are wound in contrary directions in order that one rope shall be wound up as a person is lowered by the other and unwinding rope within the drum as a piston which is fixed and within the drum through the cylinder. A projection which fits in the rope prevents the piston from turning, whilst the descent is regulated by the forcing of the liquid through an orifice in the piston so as to set up the action of a cushion or brake.

20,592.—AN APPARATUS FOR HYDRAULIC RAMS: McC. Kline and S. Wetzel.—A spring, which is a thickened foot for its adjustment and attachment to a lug upon the valve seating, carries the waste valve, the spring carrying the valve adjustably with nuts. A similar support is contrived for the r-chamber valve, of which the spring crosses the valve seating, and is mounted upon lugs at the sides, or an increase of the delivery pressure a tapering inlet joins the air chamber and the discharge pipe. 20,606.—A TRAVELLING CRANE: H. A. L. Barry.—Overhead rails support the carriage, and of the two working ropes, which are guided by pulleys, one of which are placed obliquely and one is secured to carriage and the other is passed through the fall-block and so to the carriage; on the end of the axle the sheave in the fall-block is affixed a two-armed arm; after the loaded skip has reached the place where it is to be unloaded, a reversal of the engine causes the cam strike against a pawl upon a lever which is joined to the firing-line of the skip, thus the lever is lifted to work the two drums for tipping the skip. In order that the two drums shall be driven one direction when the clutch is in action, and in the other when the clutch is out of action one drum may be stopped and locked whilst the other drum comes into its work, the drums revolve loosely upon the shaft, and on the shaft, are two discs, on the ends of which are eccentric pinions for engagement respectively with a fixed gear-wheel on a gear-wheel upon the end of the drum.

20,655.—THE MOUNTING OF THE ENDS OF DRAINS AND CONDUITS: Abton Clay Co. and Drain Pipes.—For moulding spigot and socket ends, a is dropped upon guide-rods into the middle of socket and the spigot end of the conduit is put in a mould that is mounted upon a base-plate, a pot and a socket are then made in alignment one another by means of a filling of cement, or the mould and core; spring arms attached to cross-head and core; an adjustable bar which is pressed to brackets upon the cross-head hold the end of the conduit in its place; a screw or r may be used for lifting and lowering the core, which may be balanced with a weight and cord. Conduits are after the kind specified in No. 1 of 1898.

20,681.—AN APPLIANCE FOR USE WITH FLUSHING TRAPVALVES: F. H. Williams.—The appliance consists of a vessel or receiver, which has a funnel with a siphon for its outlet, and is to be filled with a disinfectant, or some similar material, before

it is placed within a flushing or other kind of cistern. Every time a flush is made the receiver will be discharged to the level of its siphon outlet.

20,723.—BOLTS FOR DOORS, &c.: W. Doyle.—The bolt and then towards parallel to the bolt again so as to have a turned-up end at its end, the bolt will both slide and turn in a casing and will engage with a keeper, as well as in an additional keeper when it is turned upwards. The door is to be partly opened by drawing the bolt backwards as far as its turned-up end will allow, whilst the arm slides upwards inside of the keeper.

20,759.—TREATMENT OF SEWAGE: T. F. Barnard.—After the sewage has been caused to pass through a series of filter beds containing carbon in various forms it is directed to a filter bed of lime, and thence through settling-tanks to another range of filtering beds containing sand, and carbon consisting of coal slack, coke, or coke breeze, and charcoal, which, after it has been mixed with the separated solids and with coal tar, will serve for fuel.

20,796.—AN APPLIANCE FOR SLIDING SHUTTERS AND SHAKES: G. Barnes.—Spiral balancing springs are wound up, when the shashes are lowered, by means of twisted square rods or screws that operate as archimedean twist-drills, and are worked by nuts secured to the washers. The upper square end of each rod engages in a squared socket of the spring axle, and its lower end travels in a detachable split guide or bearing, the spring is prevented from running down at the withdrawal of the rod and bearing plates by means of a ratchet and pawl upon the spring axle. Portions of the frame are binged in order that they may turn the shashes inwards upon the rods, and the catch can be held in any position desired through the engagement of a cranked swivelling fork or catch with one of the square rods.

20,803.—ENERGY METERS (ELECTRICAL): Elith Thomson.—For alternating currents the induction motor meter is composed of stationary main current and pressure coils that produce separate magnetical fields, wherein two armatures are geared to one spindle and rotate together. Each of the interconnected armatures consists of a core, around which are coils, each of which upon one armature is permanently connected in a closed circuit with a coil upon the other. Each pair of interconnected coils may lie in one plane, one set of field coils being put at a suitable angle with the other, or if all the field coils are parallel to one another, the coils upon one armature are displaced about the spindle extending from the connected coils upon the other armature. If each armature carries two coils, the displacement amounts to 45 deg., and to 60 deg. if each armature carries three coils.

MEETINGS.

FRIDAY, FEBRUARY 15.

Architectural Association.—Mr. E. S. Prior on "Gothic Architecture and the Basis of its Beauty," 7.30 p.m. Royal Institution.—Professor J. J. Thomson M.A., on "The Existence of Bodies Smaller than Atoms," 9 p.m. Institution of Mechanical Engineers.—Mr. J. Ashford on "Light Lathes and Screw Machines," 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Sanitary Law," III., 7 p.m. Architectural Association of Ireland (Technical Demonstrations).—Mr. J. E. Barry on "Glass Manufacture," 4.30 p.m. (at 1, Upper Camden-street).

SATURDAY, FEBRUARY 16.

Architectural Association.—First spring visit to the Roman Catholic Cathedral and Cardinal's House, Ashley Gardens, Victoria-street, Westminster, by permission of the architect, Mr. J. F. Bentley.

MONDAY, FEBRUARY 18.

Royal Institute of British Architects (Business and Ordinary).—(1) To read the address presented by the Council to His Majesty the King on behalf of the Royal Institute. (2) To make an announcement concerning the Royal Gold Medal for the year. (3) Election of candidates for membership. (4) Mr. G. T. Hine on "Asylums and Asylum Planning," 8 p.m.

London Institution.—Mr. Arnold Mitchell on "Medical Sanitary Illustrations," 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Duties of a Sanitary Inspector," Outdoor, 8 p.m.

Local and Technical Architectural Society.—Mr. H. C. Corlette on "The Planning and Design of Churches," 6.30 p.m.

Liverpool Architectural Society.—To consider further the draft memorandum and Articles of Association in connexion with the proposed incorporation of the Society, 6 p.m.

TUESDAY, FEBRUARY 19.

Institution of Civil Engineers.—Paper to be discussed: "The Nightingale Mountain Railway," by Mr. W. J. Weightman, 8 p.m.

Royal Institution.—Professor J. A. Ewing, M.A. F.R.S., on "Practical Mechanics (experimentally treated): First Principles and Modern Illustrations," VI., 3 p.m. Architectural Association of Ireland.—Mr. G. Coffey on "Optical Refractions in Classic and Medieval Architecture," Lantern Views, 7.45 p.m.

WEDNESDAY, FEBRUARY 20.

British Architectural Association.—Mr. W. Ferguson Irvine on "Some Old Halls in Wiltshire," With illuminated illustrations, 8 p.m.

Builders Foremen and Clerks of Works Institution.—Ordinary meeting of the members, 8 p.m. Institution of Junior Engineers.—Mr. A. H. Parker, B.A., on "Works Management," II., 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(4) Inspection in the district of St. George's, Hanover-square, 2 p.m. (5) Dr. J. Priestley, M.D., on "Duties of a Sanitary Inspector: Indoor," 8 p.m.

THURSDAY, FEBRUARY 21.

Carpenters' Hall, London Wall (Free lectures on matters connected with building).—Mr. H. Heathcote Statton on "Architecture at the Paris Exhibition," 8 p.m. Institution of Electrical Engineers.—(Meeting at Institution of Civil Engineers).—If the discussion on Mr. Morley's paper is closed, the following paper will be read: "The Electrical Power Bill of 1900: Before and After," by Mr. W. L. Madgen.

FRIDAY, FEBRUARY 22.

Royal Institution.—Sir W. Roberts-Austen on "Metals as Fuel," 9 p.m. Institution of Civil Engineers (Students' Meeting).—Mr. J. L. Crillon on "Automatic Coupling," 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Duties of a Sanitary Inspector: Offensive Trades and Trade Nuisances," 8 p.m. Glasgow Architectural Craftsmen's Society.—Mr. J. G. Dunn on "The Practice of Chimney Building and Boiler Setting," 8 p.m.

SATURDAY, FEBRUARY 23.

Builders Foremen and Clerks of Works Institution.—Annual dinner, King's Hall, Holborn Restaurant, 6 p.m. Edinburgh Architectural Association.—Visit to Brunnsfild House and St. Oswald's Church. Royal Institution.—Right Hon. Lord Rayleigh, M.A. on "Sound and Vibration," I., 3 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Friern Barnet Sewage Works, 3 p.m. Dundee Institute of Architecture.—Visit to General Accident Assurance Buildings, Perth. Institution of Junior Engineers.—Visit the Willesden Station of the Metropolitan Electric Supply Company, 2.30 p.m.

SOME RECENT SALES OF PROPERTY:

Table with columns for date, location, and price. Includes entries for February 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.

CONTRACTS AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Works and Materials.....	Tottenham U.D.C.....	E. Crowne, 712, High-road, Tottenham	Feb. 19
Granite and Slag, Stony Stratford.....	W. H. P. Pritchard, Surveyor, Wicken, Stony Stratford	do.	do.
Excavation Works, Paving, &c.....	Tynemouth Corporation.....	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Street Works, Netherton and Woodside.....	Dudley Corporation.....	W. H. Travers, Engineer, Church-street, Egremont	do.
Steel Rails (1,800 tons), &c., Egremont.....	Todmorden Union Guardians.....	J. Horsfall, Architect, Burley-road, Todmorden	do.
Board Room and Offices, Hall-street.....	Pembrokeshire County Council.....	A. H. Thomas, Shire Hall, Haverfordwest	do.
Additions, &c., to Shire Hall, Haverfordwest.....	Alder-shot U.D.C.....	N. F. Dennis, Surveyor, Council Offices, Aldershot	do.
Street Works, Herrett-street, &c.....	East Retford (Notis) Corporation.....	J. D. Kennedy, Borough Surveyor, Town Hall, East Retford	do.
Broken Granite, &c.....	Salisbury R.D.C.....	D. W. Morris, Surveyor, Honington, Salisbury	do.
Road Metal.....	Bradford School Board.....	W. Bailey, Architect, 11, Alarick-street, Manchester	Feb. 20
Additions to School, Eidgeat Green.....	Manchester Guardians.....	A. J. Mingsall, Surveyor, Manchester	do.
Iron Staircase at Workhouse.....	Church, Platt Bridge, near Wigan.....	Rev. R. Davies, 9, Rosebery-street, Abertillery	do.
Baptist Chapel, near Aberlillery, Mon.....	Business Premises, Hillfield.....	J. Hartley, Architect, Skipton	do.
Two Pairs Cottages, Stowlinglot, Suffolk.....	Electrical Conduits.....	J. Birmingham, Estate Office, Stowlinglot	do.
Two Houses, Moldgreen, Huddersfield.....	Road Works, Cartmel-road, Kighley.....	W. H. Timson, Engineer, Dalhous Crescent-road, Dundee	do.
Flints and Ragstone.....	Bridge and Approaches, St. Annes-on-Sea.....	J. Berry, Architect, 3, Queen-street, Huddersfield	do.
Additions, &c., to School, Balmedie, Aberdeen.....	Shed, Dewsbury Moor.....	Barber, Hopkinson, & Co., Engrs., Craven Bank Chambers, Kighley	do.
Cottage, &c., Pare Gwyllt, Bridgend.....	Road Works, Eiland, Yorks.....	R. C. Irwin, Hunt's & Co., Corporation-Surveyor, Dewsbury	do.
House, Stable, &c., Birkin, Huddersfield.....	Road Metalting, &c., New Monkland, Hamilton, N.B.....	E. C. Brooke, Architect, 6, Huddersfield-road, Brighouse	do.
Artisans' Dwellings, Upper Rathmines.....	Additions, &c., to School, Balmedie, Aberdeen.....	A. Rankin, Surveyor, Airdrie	do.
Earthenware Sewers.....	Cottage, &c., Pare Gwyllt, Bridgend.....	F. Holman, 89, High-street, Aberdeen	Feb. 21
Tall Chimney, Wheatley, Halifax.....	House, Stable, &c., Birkin, Huddersfield.....	T. E. Lewis, Bridgend, Glam.....	do.
Making-up Moutpeller-road and others.....	Artisans' Dwellings, Upper Rathmines.....	F. J. Hicks, & Son, Surveyors, 34, New-street, Huddersfield	do.
Steel Gas-holder.....	Earthenware Sewers.....	A. A. Goodall, Civil Engineer, 39, Corporation-street, Birmingham	do.
Granite (6,975 tons) and Slag (1,457 tons).....	Tall Chimney, Wheatley, Halifax.....	W. H. D. Horsfall, Architect, Tower Chambers, Halifax	do.
Building Work at Presbyterian Church, Borough-side.....	Making-up Moutpeller-road and others.....	C. C. Smith, Surveyor, Municipal Offices, Sutton	do.
Additions to Business Premises, Worthington.....	Steel Gas-holder.....	L. C. Evans, Town Hall, Salford	do.
Asphalting, Kerbing, &c., Market-square.....	Granite (6,975 tons) and Slag (1,457 tons).....	H. Borrough Surveyor, Council Offices, Haverfordwest	do.
Surveyors' Materials.....	Building Work at Presbyterian Church, Borough-side.....	J. E. Chatterton, Council Offices, Horncastle	do.
Four Houses, Gordon-street, Eiland.....	Additions to Business Premises, Worthington.....	M. A. Robinson, Architect, Richmond-street, Londonberry	Feb. 22
Granite and Slag.....	Asphalting, Kerbing, &c., Market-square.....	W. G. Scott & Co., Architects, Victoria Buildings, Worthington	do.
Additions to School and House, New Wortley, Leeds.....	Surveyors' Materials.....	A. A. Goodall, Surveyor, Municipal Offices, Rhyl	do.
Malting Premises, Clayton, near Bradford.....	Four Houses, Gordon-street, Eiland.....	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
Additions to Schools, Abercarn, Mon.....	Granite and Slag.....	J. Haviland, 2, St. Giles'-square, Northampton	do.
Main Sewer, Railway-terrace, &c.....	Additions to School and House, New Wortley, Leeds.....	H. Bannister, Hall-lane, New Wortley	do.
Additions to Baths, Almshouse-lane.....	Malting Premises, Clayton, near Bradford.....	R. E. Chatterton, Architect, 34, Great Horton-road, Bradford	do.
Evilion, Walker Park.....	Additions to Schools, Abercarn, Mon.....	R. L. Roberts, Architect, Abercarn	do.
Cast-iron Pipes, &c.....	Main Sewer, Railway-terrace, &c.....	D. G. Macdonald, Civil Engineer, Rugby	Feb. 23
Granite, Limestone, &c.....	Additions to Baths, Almshouse-lane.....	City Surveyor, Town Hall, Wakefield	do.
Trial Boring, Hitcham, Suffolk.....	Evilion, Walker Park.....	F. Leake, Surveyor, Church-street, Walker	do.
Road Metal, &c., Lewes.....	Cast-iron Pipes, &c.....	J. Cartwright, Civil Engineer, Peel Chambers, Market Place, Bury	do.
Chimney Stack (200 feet), Bee Village.....	Granite, Limestone, &c.....	R. Howell, 1, Davenport-road, Calford, S.E.	do.
*Painting, &c.....	Trial Boring, Hitcham, Suffolk.....	W. B. Pindar, Glasshouse-street, Leeds	do.
*Taking Down and Removing Dwelling Houses.....	Road Metal, &c., Lewes.....	F. J. Wood, Civil Engineer, County Hall, Lewes	do.
Road Materials.....	Chimney Stack (200 feet), Bee Village.....	A. Smith, Engineer, Gaaworks, Aberlehn	do.
Alterations, &c., to Town Hall, Hove.....	*Painting, &c.....	Steward, Infirmary, Rackham-street, Notting Hill	Feb. 25
Granite and Slag.....	*Taking Down and Removing Dwelling Houses.....	J. Holden, Civil Engineer, 35, St. Mary-street, Cardiff	do.
Business Premises, Gortmore, Ireland.....	Road Materials.....	H. H. Scott, Borough Surveyor, Town Hall, Hove, Sussex	do.
Wesleyan Chapel, Westgate Hill, Bradford.....	Alterations, &c., to Town Hall, Hove.....	J. M. Simpson, Boston	do.
Additions to School, Mina-road.....	Granite and Slag.....	M. Sellars, Architect, Omaha	do.
Baptist Church, Kay-street, Rawtenstall, Lancs.....	Business Premises, Gortmore, Ireland.....	Walker & Collinson, Architects, Swan Arcade, Bradford	do.
Tramway Materials.....	Wesleyan Chapel, Westgate Hill, Bradford.....	W. P. Saunders, Architect, Quay-street, Bristol	do.
Electrical Plant.....	Additions to School, Mina-road.....	J. H. Spencer, Architect, Bury-road, Rawtenstall	do.
Asphalting, Bricks, Cement, &c.....	Baptist Church, Kay-street, Rawtenstall, Lancs.....	R. W. Smith, Surveyor, Council Offices, Rawtenstall	do.
Kentish Ragstone (500 tons).....	Tramway Materials.....	P. P. Wilson, 69, Victoria-street, S.W.	do.
Guernsey Granite, Basalt, &c.....	Electrical Plant.....	C. F. Wike, Civil Engineer, Town Hall, Sheffield	do.
Residence, Camborne Veor, Cornwall.....	Asphalting, Bricks, Cement, &c.....	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
*Works and Materials.....	Kentish Ragstone (500 tons).....	S. Hill, Architect, Green-lane, Redruth	do.
Rebuilding Inn, High-street, Merthyr Tydfil.....	Guernsey Granite, Basalt, &c.....	See Advertisement.....	Feb. 26
Road Widening.....	Residence, Camborne Veor, Cornwall.....	Town Hall, Charing Cross-road, W.C.	do.
*Kentish Flints.....	*Works and Materials.....	C. M. Davies, Architect, 112, High-street, Merthyr	do.
*Culvert.....	Rebuilding Inn, High-street, Merthyr Tydfil.....	Engineer, Public Offices, Dyne-road, Kiburn, N.W.	do.
*Works and Materials.....	Road Widening.....	Public Offices, Barking	do.
*Works and Materials.....	*Kentish Flints.....	City Engineer, 63, Queen-square, Bristol	do.
*Granite.....	*Culvert.....	Borough Surveyor, Town Hall, Hackney	Feb. 27
Bathing Establishment, Whitley, Northumberland.....	*Works and Materials.....	J. Goodenough, District Surveyor, Thame	do.
*Portland Cement.....	*Works and Materials.....	J. P. Spencer, Civil Engineer, Newcastle-on-Tyne	do.
Gas Purifiers.....	*Granite.....	Manager, L. C. C. Works Department, Belvedere-road, S.E.	Mar. 2
*Maintenance and Repair of Main Roads.....	Bathing Establishment, Whitley, Northumberland.....	B. H. Votcs, Council Offices, East Dereham	do.
*Broken Granite.....	*Portland Cement.....	County Surveyor, 89, Week-street, Maidstone	Mar. 5
*Guernsey Granite.....	Gas Purifiers.....	Engineer, 712, High-road, Tottenham	do.
*Sewerage Works.....	*Maintenance and Repair of Main Roads.....	H. T. Wakelam, Guildhall, Westminster	do.
*Superstructure of Avonbank.....	*Broken Granite.....	F. Wentworth-Shields, 1, Cranbury-road, Southampton	Mar. 7
*Infants' School.....	*Guernsey Granite.....	Secretary, Electricity Department, Temple Back, Bristol	do.
*Hotel, Weybourne-on-Sea.....	*Sewerage Works.....	See Advertisement.....	Mar. 22
Business Premises, South Dene, Great Yarmouth.....	*Superstructure of Avonbank.....	R. Carter, Architect, 2, St. Andrew-street, Great Yarmouth	do.
Additions to Crown Works, Leeds.....	*Infants' School.....	G. Waller, Architect, Middlegate-street, Great Yarmouth	do.
Lodge, Cottage, &c., Granley, near Ripon.....	*Hotel, Weybourne-on-Sea.....	A. E. Dixon, Architect, 5, Park-lane, Leeds	do.
	Business Premises, South Dene, Great Yarmouth.....	Bland & Brown, Architects, Harrogate	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in
*Clerk of Works.....	Dartford R.D.C.....	47. 4s. per week	Feb. 25
*Architectural Assistant.....	Newport Corporation.....	37. 10s. per week	do.
*Clerk of Works.....	Brentford Union.....	47. 4s. per week	Feb. 27
*Architectural Draughtsman.....	Bury Tramways Committee.....	75l. per annum	Mar. 1
*Junior Assistant.....	Ipswich Corporation.....	1,000l. per annum	Mar. 2
*City Engineer and Surveyor.....	Westminster City Council.....	1,000l. per annum	Mar. 2

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, pp. iv, vi, viii, x, & xxiv. Public Appointments, pp. xx, xxi, & xxiv.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing various materials and their prices. Includes sections for BRICKS, &c., HARD STOCKS, GRIZZLES, STAFFORDSHIRE, PORTLAND CEMENT, STONE, TILES, BUILDING WOOD, and COPPER.

PRICES CURRENT (Continued). WOOD.

Table listing wood products and their prices. Includes Fir Timber, Swedish Balks, Pitch Pine Timber, JOINERS' WOOD, White Sea, and various sizes of deals and battens.

JOISTS, GIRDERS, &c.

Table listing joists and girders, including Rolled Steel Joists, Compound Girders, and Cast Iron Columns.

METALS.

Table listing various metals and their prices. Includes Common Bars, Staffordshire Crown Bars, Mild Steel Bars, Hoop Iron, and Sheet Iron.

PRICES CURRENT (Continued). ENGLISH SHEET GLASS.

Table listing English Sheet Glass products and their prices. Includes 15 oz. thirds, 21 oz. thirds, 26 oz. thirds, and 32 oz. thirds.

OILS, &c.

Table listing various oils and their prices. Includes Raw Linseed Oil, Turpentine, and Genuine Ground English White Lead.

VARNISHES, &c.

Table listing various varnishes and their prices. Includes Fine Elastic Copal Varnish, Best Elastic Copal Varnish, and Best Hard Copal Varnish.

TO CORRESPONDENTS.

Notice to correspondents regarding article submissions, including instructions on how to address communications and the publisher's policy on accepting or rejecting articles.

TENDERS.

Notice regarding tenders for construction projects, including details on how to submit bids and the names of the relevant parties.

DERBY.—For the erection of a chimney shaft, for the Corporation. Mr. A. Eaton, architect, 6, St. James' Street, Derby.

DURHAM.—For the erection of an engine house at sewage disposal works, for the Urban District Council. Mr. H. W. Taylor, A.M., Inst. C.E., St. Nicholas-chambers, Newcastle-on-Tyne.

[See also next page.]

DEVONPORT.—For the erection of St. Budeaux Board School, for the Devonport School Board. Messrs. Hine & Odgers, architects:—
 Berry £19,853
 Goad 17,850
 Blackell 17,711
 Roach & Lovell 17,350
 Carter 16,681
 Skinner 16,349
 Paynter 16,250
 Trevena 16,100
 May 16,055

GRAYS (Essex).—For the erection of cottage and stables adjoining Ravenswood. Mr. Christopher M. Shiner, architect, 3, Bond-court, Walbrook, E.C., and Grays:—
 Hammond & Son £639 0 | Brown £560 0
 Lawrence 605 0 |

GRIMSBY.—For the erection of four shops, Pasture-street, for Messrs. Hewitt Brothers, Limited. Mr. Herbert C. Scaping, architect, Court-chambers, Grimsby. Quantities by Mr. J. Watson, Hull:—
 G. & J. Smith £2,800 0 0 | H. Marrows £2,561 15 6
 Thompson & Sons 2,500 0 0 | W. Iou 2,527 10 0
 Hewins & Goodband 2,763 12 0 | Gilbert & Kirton? 2,478 4 1

LONDON.—For alterations and additions to No. 49, Woodgrange-road, Forest Gate, E., for Messrs. Loid & Co. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E. C.:—
 G. E. Todd & Co. £2,469 | J. & H. Cocks, Ltd. £2,173
 A. E. Symes 2,195 | W. J. Maddison? .. 1,947

NEWPORT (Mon.).—For the erection of a council chamber, offices, &c., Pentonville, for the Monmouthshire County Council. Mr. W. Tanner, County Surveyor, Newport, Mon.:—
 Jones Bros. £10,335 | J. Moore £8,830
 A. E. Parfit 9,800 | C. H. Reed 8,800
 Ewers & Co. 9,570 | W. A. Linton 8,789
 T. G. Diamond 9,500 | E. C. Jordan 8,697
 Morgan & Co. 9,151 | Richards & Co., Newport? 8,470
 J. Linton 9,140
 W. M. Blackburn 8,995

PARKSTONE (Dorset).—For the erection of a house and shop, Sandhanks-road, for Mr. G. Kilford. Mr. Walter Andrew, architect, Parkstone:—
 Jenkins & Son £1,497 0 0 | A. & F. Wilson £1,050 0 0
 E. Smith 1,350 0 0 | Burt & Vick.. 998 0 0
 Baker & Pearcey 1,404 0 0 | Upper Park-stone? 987 10 8
 Rigger 1,050 0 0 |

POOLE.—For the erection of a car-shed, offices, boundary walls, &c. Mr. C. W. G. Little, engineer, the British Electric Traction Company, Dinnington House, Norfolk-street, Strand, W.C.:—
 Jones & Board £2,724 | Burt & Vick, Poole? £2,142
 Jenkins & sons 2,054 |

SHEFFIELD.—For alterations and additions to the Howard Hotel, Howard-street and Pond-street, Sheffield, for Messrs. the Directors of Thomas Rawson & Co., Ltd., Sheffield. Messrs. Hall & Fenon, 44, St. James-row, Sheffield. Quantities by the architects:—
 G. H. May £1,734 8 5 | T. Margerrison £1,333 0 0
 W. H. Bowden 1,719 0 0 | G. & C. Earl.. 1,378 0 0
 Geo. Vaughan 1,609 0 0 | C. H. Gillam 1,270 0 0
 J. L. Lilleker 1,307 8 0 | J. S. Teasby, Carterknowle-road? 1,240 0 0
 F. Turner 1,495 0 0
 A. Bradbury.. 1,469 0 0
 Bee & Son.... 1,402 0 0

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SOUTH SHIELDS.—For alterations to premises, No. 7, Victoria-terrace, for Mr. John Shotton, jun., Mr. Henry Grieves, architect, Albany Chambers, South Shields:—
 General Trades.—M. Hall, jun., South Shields £205 0
 Encaustic Tiles.—Walker & Son, Newcastle 74 5
 Granite Work.—Farbridge & Son, South Shields 45 10
 £344 15

SWANLEY.—For the erection of the White Oak Schools, for the Metropolitan Asylums Board. Quantities by Messrs. W. H. & P. B. Strudwick, New Inn Chambers, Wych-street, Strand, W.C. Messrs. Newman & Newman, architects and surveyors, 34, Tooley-street, London Bridge, S.E.:—
 Bulman Bros. £151,256 | B. E. Nightingale £133,227
 Leslie & Co. 141,450 | Willmott & Sons .. 122,915
 Foster & Dicksee.. 140,270 | Lorden & Son 121,933
 R. L. Tonge 139,652 | J. J. Wise 116,035
 Stephens, Easton, & Co. 135,209 | Martin Wells & Co. 115,000
 C. Wall, Chelsea? 112,374

TREDEGAR (Mon.).—For the erection of a chapel and schoolroom, Commercial-road. Mr. W. S. Williams, architect, Elmwood, Tredegar:—
 Rees Edwards, Tredegar £1,322
 G. A. Pillatt, Nottingham? £572

WEST BRIDGFORD (Nottingham).—For erecting a single house, Millicent-road, West Bridgford, according to plans and quantities by Mr. William R. Gleave, architect, 18, Low-pavement, Nottingham:—
 G. A. Pillatt, Nottingham? £572

WEST BRIDGFORD (Nottingham).—For erecting a single house, Bridgford-road, West Bridgford, according to plans and quantities by Mr. William R. Gleave, architect, 18, Low-pavement, Nottingham:—
 W. & J. Simons, Nottingham? £739

TERMS OF SUBSCRIPTION.

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The Builder.

VOL. LXXX.—No. 3079

FEBRUARY 23, 1904.

ILLUSTRATIONS.

Study of an Indian House (Owen Jones Prize, R.I.B.A., 1902).—By Mr. Hervey Rutherford	Double-Page Ink-Photo.
Hotel de Ville, Audenarde (Pugin Studentship, R.I.B.A., 1902).—By Mr. H. W. Cotman	Double-Page Ink-Photo.
Design for Entrance Gateway to a Public Park (Tite Prize Design, R.I.B.A., 1902).—By Mr. Walter Fairbairn	Two Double-Page Ink-Photos.

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The Unhappy Antiquities of Palestine.



Now, unhappily, these most interesting cities (like an unburied Pompeii) exist no more. The latest accounts from various travellers give the same sad result. Gerasa is occupied by a band of colonists from Bosnia (Mohammedans dissatisfied with an Austrian administration), and they are pulling down the Roman ruins wholesale, and the columns of the famous "street of columns" are being removed, to some extent, for the purpose of replacing the injured columns of the great Mosque of Damascus. The Roman masonry is otherwise being broken up to serve for garden walls and ordinary mud-hut architecture. The marvellously-preserved carving, which has survived fifteen centuries of Byzantine and Arab carelessness, is now being hacked off the squared stones in order to fit them for insertion in a Turkish "Khan" or "hareem" wall. In Ammán the destruction of the classic city is even more complete; very few of the public buildings now remain, and the columns of the "street" are being thrown down for the purpose of breaking up into small pieces for enclosure walls. The "Circassians" as these colonists call themselves, act in a methodical manner, and they are gradually eating through the city. They employ the curious carts of Turkish peasants, with the solid wheels, for transporting the broken up remains. The famous theatre of Ammán is now quite gone; the temples, in fact, the city, as a monument of the early centuries has completely disappeared, and the very few tourists who visited it during the past few years were privileged in seeing an extraordinarily preserved Classic town, which has since been swept away.

Nothing can now be done to preserve Ammán and Gerasa, but their fate suggests what threatens nearly all the most famous monumental remains in Turkey. Can anything be done to arrest the Turkish Destroying Angel (or perhaps we may say culture). The Turk has discovered that there is something to be made out of an increased population, and so he invites his co-religionists from the Balkans, the Caucasus, or Algeria—where they "suffer" the "persecution" associated with a Christian domination; and the deserted districts of Syria or Asia Minor, which teem with the monumental remains of past civilisations, afford an excellent squatting ground for

these comparative savages. The promoters and prospectors of these colonies naturally seize on such sites as have the original advantage of good water, an air of former cultivation, and a ready-made quarry of old building stone. In this way we may conclude that, within a measurable time, all the most famous ancient sites will be converted into the more or less permanent settlements of the "Circassians," as these colonists are termed, whether they come from Algeria or Herzegovina. To the archaeologist and historical student such a state of things is sufficiently deplorable, but what can be done? The case seems hopeless; still, an international protest might perhaps be set on foot to induce the Constantinople authorities to use some discretion in encouraging the wholesale destruction of the monuments of the different countries constituting the Ottoman Empire. The English archaeological societies should surely not find such an enterprise outside the scope of their institution, and the Russian Imperial Archaeological Institute would doubtless cooperate.

Much still remains in these countries to preserve and protect. Palmyra will be threatened before long; it possesses abundant water and heaps of old masonry suitable for building Circassian "houses." Surely it is worth while trying to preserve such a place.

The beginning of a transformation is taking place in Turkey. Bolstered up by the flattery and "moral support" of the European Powers, the warlike savagery of the race tamed by so many years of peace, and by the introduction of railways, telegraphs, and the general machinery of civilisation, the modern Turks are displaying the first gleams of an intelligent desire to develop the resources of their country for their own benefit. Within the last year or two the Sultan has inaugurated this new system by laying claim to the whole valley of the Jordan and the whole of the Dead Sea as his personal property. Title-deeds, or "cushans," are being rigorously inquired into on all hands, and the Mohammedan legal profession is in a fair way to become as important as the military system of former days. All the mineral riches of Palestine and Syria are now being jealously guarded as soon as discovered; and foreign enterprise, which is

these comparative savages. The promoters and prospectors of these colonies naturally seize on such sites as have the original advantage of good water, an air of former cultivation, and a ready-made quarry of old building stone. In this way we may conclude that, within a measurable time, all the most famous ancient sites will be converted into the more or less permanent settlements of the "Circassians," as these colonists are termed, whether they come from Algeria or Herzegovina. To the archaeologist and historical student such a state of things is sufficiently deplorable, but what can be done? The case seems hopeless; still, an international protest might perhaps be set on foot to induce the Constantinople authorities to use some discretion in encouraging the wholesale destruction of the monuments of the different countries constituting the Ottoman Empire. The English archaeological societies should surely not find such an enterprise outside the scope of their institution, and the Russian Imperial Archaeological Institute would doubtless cooperate.

Much still remains in these countries to preserve and protect. Palmyra will be threatened before long; it possesses abundant water and heaps of old masonry suitable for building Circassian "houses." Surely it is worth while trying to preserve such a place.

The beginning of a transformation is taking place in Turkey. Bolstered up by the flattery and "moral support" of the European Powers, the warlike savagery of the race tamed by so many years of peace, and by the introduction of railways, telegraphs, and the general machinery of civilisation, the modern Turks are displaying the first gleams of an intelligent desire to develop the resources of their country for their own benefit. Within the last year or two the Sultan has inaugurated this new system by laying claim to the whole valley of the Jordan and the whole of the Dead Sea as his personal property. Title-deeds, or "cushans," are being rigorously inquired into on all hands, and the Mohammedan legal profession is in a fair way to become as important as the military system of former days. All the mineral riches of Palestine and Syria are now being jealously guarded as soon as discovered; and foreign enterprise, which is

continually being offered for the development of these riches, is viewed with the utmost hostility. The English railway started to run from Haifa to Damascus some eight years ago has been nipped in the bud; and as part of this new system of setting the Mohammedan house in order, an influx of colonists is being encouraged from those fringes of the European world where Mohammedanism is recoiling from the distasteful manners and customs, and modern ideas, of civilisation. Every steamer to Beyrout brings whole families of Algerines, Tunisians, or Albanians, and these people find their way into the *hinterland* and serve to swell the forces of Mohammedan obstructiveness against Western enterprise and influence. From any point of view except that of archaeology such a state of things would be merely curious, but as it involves the destruction of some of the most interesting historical monuments ever erected, the disaster must be considered [the greatest of the kind the world has seen, more especially considering that at the present day it ought to be so completely prevented.

The first suggestion for this new Turkish system of colonisation probably originated in the days when the English sentiment for "restoring" the Jews to Palestine was at its height in the seventies and eighties. Even then the Turks, who looked upon the Jews as very unwelcome strangers, began to consider the advisability of meeting this unavoidable difficulty by the usual oriental expedient of pitting one race against another, and so wherever the Jews were settled by foreign influence the Turks have started a "Circassian" colony. Caesarea on the coast was one of the first to be founded, and the Roman ruins and the interesting remains of the crusading kingdom have been broken up to build the squalid "Circassian" huts with thatched roofs, and the rough walls of straggling gardens. And this is the last fate of the vestiges of that classic civilisation which has been the theme of study and "renaissance" all through the centuries of the immediate past. How little Volney, De Vogue, or Renan, thought the interesting ruins they were so instrumental in recovering for European study would, within a comparatively few years, be sacrificed to the sordid greed and interests of a barbarous Turkish colonisation.

USE OF SLATE IN NORTH-EAST CORNWALL.

THROUGHOUT Cornwall slate is in commoner use than in any other part of the United Kingdom. Particularly is this the case in the north-east part of the county, owing to the great pits of the old Delabole slate quarries, in the parish of St. Teath, which are still in active operation. St. Teath is bounded on the north by Tintagel, on the east by Lanteglos and Michaelstow, on the south by St. Tudy and St. Kew, and, on the west by Endellion and the sea. These quarries are of considerable antiquity; they were of much repute in the days of Queen Elizabeth. Carew, writing about 1600, says:—"Delabole slate is in substance thinn, in colour faire, in weight light, in lastinge stronge, and generally carrieth to good regard, as (besides the supply for home provision) great store is

yerely conveyed by shipping, both to other parts of the Realme, and also beyond the seas into Britaine and Netherland." Borlase gives the Delabole slate a very good character. In his "Natural History of Cornwall," published in 1758, it is stated that "the stone of this quarry is not subject to rot or decay, to imbibe water, or split with falling; but for its lightness and enduring weather, is generally preferred to any slate in Great Britain." Nor is this too high praise, considering that much of the ornamentation and lettering [of the Delabole slate used for memorials is as fresh and delicate in its cutting as it was when it left the mason's yard in the days of Elizabeth or James I.

The slate of these quarries has somewhat deteriorated of late years in texture and lamination, but it still retains its special qualities of lightness and durability. Notwithstanding the great depth at which the quarries are now worked and the amount of debris required to be removed, the use of improved machinery and the nearness of the new line of railway have so developed the industry, that about 150 tons of material are raised daily to the surface. In addition to considerable land sales for local use, the railway conveys about 1,000 tons per month of dressed slates for shipment at Wadebridge or Padstow. These are of every size, from the great slabs for cisterns down to the smallest of roofing slates. From the North Cornwall coast they are conveyed not only to the great English ports, but to almost every part of Europe.

The processes of quarrying and preparing the slates are ingenious, and much more interesting to the intelligent visitor than those of the great Welsh quarries. It is not, however, our intention to offer any descriptive comments on these processes, or on the simpler and more antique methods by which they were preceded, but rather to notice briefly the chief purposes for which these slates are, or have been, used in that part of Cornwall.

One of the least picturesque uses to which the larger spoil of the quarries is put—and has been for many a long year—is the construction of rude but fairly effective fences. In the immediate vicinity of Delabole, and for some few miles round, slabs of rough slate of various sizes and heights, some square and some pointed at the tops, are driven into the ground close to each other, and form a durable fence between fields or round gardens and yards, so long as they remain upright. In the dusk, when tramping some moorland road or track, these fences, suddenly encountered, have rather a ghost-suggestive effect, as the traveller seems to be continuously approaching a succession of graveyards.

The same scarcity of wood and the lack of brickmaking clay throughout this district, which induced the inhabitants to use slate for fences, has also caused them to use still larger slabs for the walls of pigstyes, hovels, and a variety of farm outhouses, including even some of the humbler and older cottages. We have several times measured slabs used for such purposes, and have found some of the largest 7 or even 8 ft. high by 4 ft. wide. The kitchens and back premises of the older houses, as well as the cottages and their approaches, are usually paved with slate slabs. The older examples, through constant foot friction, attain such a bright

and polished surface that they might almost be taken for a deep blue marble. This is especially the case with church paviers, though absolutely in this land of slate not a few of the church "restorers" have of late ejected these time-worn slabs, so beautiful and restful to the eye, in order to replace them with the cheapest kind of encaustic tiling! The smallest size slate that is ever cut is 6 in. by 3 in.; these are occasionally used for paving church porches or church towers, or other places where there is much traffic. They are pitched on their edges in squares of 6 inches, arranged alternately in different directions. This was a very old use in the North Cornwall churches, but has of late for the most part disappeared; it can still be seen in the churches of St. Minver and Lancaust.

It might be thought by the unobservant that there could be little or no difference in the application of slates for roofing purposes; but the fact is that there is no greater contrast in Cornish building than the ancient and modern roofings of the slate districts. Some of the old manor-houses, once so numerous in St. Teath and the adjacent parishes, where the manors were mostly of small extent, still possess in whole or in part sixteenth and seventeenth century slated roofs—such as Pengenna, Polrode, Penrose, Trehame, and the back part of Trehannick. The same may be noticed with some of the old mills and cottages. There was then no elaborate machinery for the splitting and shaping of the slates; they were somewhat thicker and varied much in size; the smaller ones, that predominated, measuring from 6 in. to 8 in. or 10 in. in length. As a rule, the old slaters used larger and larger slates as they neared the eaves, some of them as much as 3 ft. in length at the extreme margin. These old slated roofs, in their pleasing irregularity and with their occasional depressions, are charming in outline, and the whole often assumes a silvery greyness of tone most soothing to the artistic eye. In the Cornish church restorations of the last half century, many of which (especially those undertaken in the "sixties") were grievously vulgar in character, it seems to have been the invariable rule to choose for the new roofs the thinnest and glossiest of slates, all of precisely the same size, and geometrically arranged in exactly parallel lines. The effect is disastrous, and often imparts a look of smugness to these interesting churches so largely rebuilt in the fifteenth century, the contrast of the sleek purple slates and smooth red ridge tiles with the granite walls and tracery being so excessive. Nowhere within a circuit of many miles round Delabole is there a single old church roof left, save at the little unrestored church of Tremayne. Nor is there the least excuse to be found for this wholesale construction of brand new slating under the plea that the House of God must be safely ceiled from the weather, for, within the self-same circuit, many a roof of picturesque beauty can still be noted over manor-house farmstead, or cottage that was probably slated in the time of Elizabeth or in early Jacobean days. Even if it was proved, in certain cases, that an old church must have new slates, a slight increase in the expense would have procured rougher and thicker slates, and would have allowed for the sizes to be graded. Possibly some few old

churches or other old buildings remain in
ornamental wall that may ere long be crying for
new roofs, when, if they are really required,
architects might surely strive to get rid of
the glossy meagreness that is the charac-
teristic of most of the new slating.

It is pleasant to notice an old use of
slates in connexion with Cornish churches
survived in some of the more successful
restorations, such as that of St. Tudy, where
slates with scolloped or vandyked edges are
used under the gable ends as protections for
the woodwork, the effect being somewhat the
same as that of the ornamental bargeboards
of half-timbered and other dwellings.
The ruthlessly restored churches of
St. Andrew, Minster, and Forraburg had
mainly of slates thus treated, a few having
ornamental perforations mostly of cruci-
form pattern. We noticed one or two of
this character in new work at the exposed
church of Advent.

A nice use for slate slabs, when so easily
and cheaply procurable, which seems to be
a comparatively modern invention, is to
face them over the outer doorways of
cottages or other dwellings at a considerable
angle, supported by simple iron brackets.
These slabs, 2 ft. to 4 ft. in width and of a
length that corresponds with the breadth of
the doorway, form a good break in the wall-
plane, and afford a useful degree of shelter
from rain or sun.

But the most interesting, if not the most
serviceable use to which the great slates of
Delabole have been put for many and many
generations is in the formation of memorials
to the departed. The graveyards for miles
around are full of upstanding slate head-
stones, hardly 1 per cent. being of any other
material. Those whose tastes lie in the
direction of copying old epitaphs with their
own rhymes will find abundant occupa-
tion in this district. Down to the present
day, the Cornish folk love to have in-
scribed over the grave of relative or
friend a verse of a hymn, or some
well-worn or original doggerel in rhyme.
In many a parish in the shires the
verse of the incumbent is that naught save
a verse from the Scriptures is to form the
comment on a headstone or other memorial,
and the ruling is meekly accepted. But who
could the Cornish parson who attempted to
carry out any such regulation! The
durability of the Delabole slate is strikingly
emphatically exemplified by these churchyard headstones.
Seventeenth century epitaphs can frequently
be found, and occasionally sixteenth, with
lettering almost as legible as the day it was
cut.

When slate began to be used for memo-
rials within churches it is not possible
now to say. The only one of pre-Reforma-
tion date that we have noticed in this
district is the stone to John Boskarrock in
the church of Endellion. The slab, which
is now placed against the east wall of the
north aisle, has a cross with a floriated head
spanning the whole length. The marginal
inscription in Latin to this gentleman of one
of the most ancient of Cornish families, is
intended to record his death, 1537, concluding
with the pious aspiration: "Cujus amine
proficietur Deus. Amen." In the days of
Elizabeth, when high-sounding and often
bombastic and presumptuous epitaphs be-
came the fashion, slate lent itself readily to
the custom, and was commonly used by the
wealthy families of this neighbourhood not

only for epitaphs and highly ornamental
Renaissance borderings and ornaments, but
also for heraldic display and for effigies
in high relief. The treatment of the effigies
is noteworthy, and the slate in the best
examples yields itself admirably for the por-
trayal of features and of details of dress and
ornament. The best of this kind of work
that we have noticed are three dateless and
nameless ladies in the north aisle of the
church of St. Tudy, and two Nichol monu-
ments at the west end of the south aisle of
the same church, *temp.* Elizabeth and James
I.: Honor, wife of John Webber, and her
three children in the church of St. Kew;
Christopher Rogers and wife, and Lewis
Adams (vicar) and wife in St. Breward
Church, both erected in 1609; and the
Bennet effigies in St. Teath Church, 1636.
For a quaintly debased style of incised
slate effigy, the slab to the memory
of Jane Meredith, 1662, in the church
of Michaelstow should be noted.

These have all been originally table tombs,
but at times of re-pewing or "restoration"
have been dismantled and portions placed
against the walls. The Rogers tomb, how-
ever, in St. Breward Church is still erect.
There is good heraldry, with mantling, and
ornamental borders to the Kestell family,
1581, in the church of Eglosayle, banished
under the tower as though discreditable
during the restoration; at Trevalyn, to a
Roscarrow, 1646; at Padstow, to the
Prideaux family; and in connexion with
the above-named effigies. The great mural
monument to the Trederick family, 1578, in
the church of St. Broock, is the most ambi-
tious effort in slate that we have noticed.

"Restorations" are also responsible for
ejecting a variety of slate memorial slabs
and stones and breaking up or losing others
out of the churches. The worst instance of
this is the beautifully situated church of
Lanteglos, where, to make room for a poor
set of coloured tiles, already in bad repair
and slovenly condition, slates with inscrip-
tions of much interest, and of dates varying
from 1585 to 1652, were turned out, and now
lean against the outer walls of the church,
where they are overgrown with ivy, weeds,
and rank grass. At St. Teath there are
several Elizabethan inscribed slates against
the outer east wall of the church, and one to
John Brod, gentleman, 1577, near the porch
at Michaelstow. These ejected memorials
ought to be replaced under cover for pre-
servation. However durable Delabole slate
may be, these particular stones were not
chosen for exposure.

An early use of slate for a well-defined
ecclesiastical purpose is to be noted in the
north chancel chapel of the church of St.
Marcelliana at Tintagel, where there is an
altar of solid masonry, the *mensa* of which,
with its five consecration crosses, is of slate.
This, however, was not the usual material
for Cornish altar stones. The altar stone of
the chapel of St. Julitta on the castle rock
at Tintagel is of granite, and there is a
similar stone for the altar in the south aisle
of the church of St. Breward. A later
church use for slate was for the tables of the
Ten Commandments. At the west end of
the south aisle of the church of St. Tudy
are slate tablets inscribed with the Command-
ments; they are well lettered and have
good head and tail strips of ornament.
They are of some age, and it seems a pity
that they were displaced at the church's

restoration. The Commandments on slate
are also to be found in the church of
Michaelstow; in that instance they are
relegated to the north aisle.

It only remains to state, after the briefest
fashion, some of the uses to which the
Delabole slate is now put which have
not been previously noted. It is made into
cisterns (as large as 2,000 gallons), corn-
chests, pig-troughs, mangers, pump-troughs,
baths, setting-troughs, milk-coolers, chimney-
tops, mantelpieces, window-sills, lintels,
quoins, caps for mow-steads, butter-stones,
and garden-edging. The larger and coarser
refuse is also much used for general building
purposes. The one purpose for which
Delabole slate seems quite unfitted is the
framed slate for school purposes. The
ordinary slate pencil hardly makes any im-
pression on a Delabole slate.

NOTES.

IT appears from the local
papers that the special com-
mittee appointed to consider
the question of a site for a cathedral at
Liverpool have rejected the idea of erecting
one on the site of St. Peter's Church (the
present pro-cathedral). We think they are
right, both because the site, in an archi-
tectural sense, is too confined, and
because it would involve the destruction
of St. Peter's Church, which, though ugly
enough, has a historical interest as one of
the older churches of Liverpool. The other
two sites talked of are that of St. Luke's
Church, and that in Monument-place,
London-road. The St. Luke's site is open
to the same kind of objections as the St.
Peter's site. In an architectural sense it is
a side position, with no street leading up to
it which could centrally face the proposed
cathedral; and St. Luke's is one of the most
important of the early Gothic revival churches,
and for the date of its erection is not with-
out merit, besides being also a kind of
historical monument of that phase of nine-
teenth century English architecture, and it
would be a pity to destroy it. What is called
the Monument site is a wide space just below
a point where two streets diverge; it is rather
narrow, but in other respects it is an archi-
tecturally advantageous site; the west front
of the cathedral would face a tolerably wide
road leading centrally up to it, and would
(if we remember right) be seen from St.
George's Hall. In an architectural sense it
is the best site that has been recently
proposed.

It is clear that in the approach-
ing County Council Election
each side intends to make the
housing question one of importance. This
is as it should be. At the same time, from a
practical point of view, it is desirable that
each side should go into detail on this matter.
In what way do they differ? The Progressives
point to the past, the Conservatives to a
future, in which, if they are given a major-
ity, they will do more than their opponents.
But in what way do they intend to do
better? Last week we gave a *résumé*
of the housing work in London for the
last half century. It is useless to deal
in generalities. What the voter desires to
know is in what way the policies of the two
opposing sides differ. These divisions in
two parties are in many ways absurd.
The need of the electors is the choice of

The Liverpool
Cathedral
Question.

The
Housing
Question.

capable men who will attend to [municipal business. Attempts to sketch rival policies on broad outlines can have no practical result, since the question of housing is essentially one of details. It is so important, that we hope the various candidates will enlighten the electors on their views on the various points which arise on this question.

On the invitation of the London County Council we had an opportunity last week of inspecting a model conduit system of electric traction which has been set up at Camberwell. We were disappointed to find that the electric car exhibited was running on the Westinghouse track, and was the one recently exhibited at the Agricultural Hall. There was shown, however, a model of the conduit system which the County Council propose to adopt on several of their tramways. We studied this with great interest, as it is Dr. Kennedy's solution of the most important question of electric traction for London. Midway between the ordinary rails there is a third rail, which has a narrow slot—only $\frac{3}{4}$ in. wide—down its centre. This slot leads into a concrete conduit, the bottom of which is about 1 ft. 9 in. below the top of the slot rail. The live conductors will be two steel rails, one on each side of the conduit, and supported every 15 ft. on insulators. The current will be collected from the conductors, and transmitted to the motors on the car by rubbing contacts on a plough carried by the car and passing down through the slot. This is nothing very novel, but the problem is not one that calls for startling inventive ability so much as for skilful mechanical engineering and attention to details of drainage, the prevention of leakage from the conductors, and the cleaning out of mud and refuse. Judged from this point of view, we regard it as a successful solution. Of course it would have been better to have had a larger and deeper conduit, but this would have enormously increased the expense, owing to the network of pipes, &c., under the streets. It is intended that the whole of the Council's tramways south of the Thames shall be supplied with electrical energy generated at the Camberwell station and distributed from numerous sub-stations. The first part of the Council's tramways will be reconstructed and worked by electricity in about eighteen months' time.

A CURIOUS and important decision has just been delivered, in the case of *Hull v. The London County Council*, by a Divisional Court of the King's Bench Division, on Section 73, Sub-Section 3, of the London Building Act. The question was whether an advertising sign came within the words of that sub-section, and if so, the permission of the County Council for its erection should have been obtained. The words of the sub-section are "except in so far as is permitted by this section in the case of shop fronts and projecting windows, and with the exception of water pipes and their appurtenances, copings, string courses, coruices, facias, window-dressings, and other like architectural decorations, no projection from any building shall extend beyond the general line of buildings in any street, except with the

The London Building Act, Advertising Signs.

permission of the Council." The Court came to the conclusion that a sign of this kind—a case attached to the wall by iron brackets—was not within the words of the section, for the intention of the Legislature was to prevent projections of an architectural kind—such things, in fact, as formed part of the building. This decision, therefore, is one on the principle of construction to be adopted in construing this portion of the Act. Moreover, as the Court pointed out, the Council is empowered by Section 164 of the Building Act to make by-laws for, among other things, the regulation of signs and structures overhanging the public way. It is clear, therefore, that regulations can be made to prevent advertising signs from being detrimental in any way to the public interest.

THE paper read to the Institution of Electrical Engineers this week by Mr. W. L. Madgen on "The Electrical Power Bills of 1900: Before and After," was a strong plea in favour of improved legislation in connexion with electrical matters. He pointed out that the general supply of electrical energy for industrial and domestic purposes is practically governed by the Act of 1882. Now, when this Act was framed, it was thought that a mile from the central station was about the outside limit to which electrical energy could be economically supplied. The Act contemplated that the Local Authority would become the ultimate owner of the local undertaking, and hence the restrictions as to the period and the terms of the purchase, the clauses as to consent, &c., which heavily handicap private enterprise. A Joint Committee of the two Houses reported in 1898 that in their opinion when it was for the public advantage that electrical energy should be supplied over wide areas, including the districts of numerous Local Authorities, then the provisions of the Electric Lighting Acts, which require the consent of the Local Authority, should be amended. During the last two or three years nothing whatever has been done to carry out this recommendation, and Mr. Madgen alleges that the misuse by the Local Authorities of the powers conferred on them by the Acts is notorious. However, four power Bills were passed last Session, and the main power station of the "County of Durham" company will be available in a few months for a comprehensive system of supply. Some very hard things were said about the Tramways Act of 1870 and its provisions in rigidly limiting the term of the concession to twenty-one years, and practically fixing the price at which the municipality may take it over at something considerably below its value. In conclusion, Mr. Madgen asked the Council to appoint a committee to consider what steps should be taken to remove the legal restrictions which have hampered the progress of the industry. The paper presents the case for private enterprise very strongly, but it would perhaps have more weight if it recognised the excellent pioneer work done by many municipalities, and the disastrous consequences that sometimes follow when private companies make haste to get dividends.

The Baptist Union Corporation.

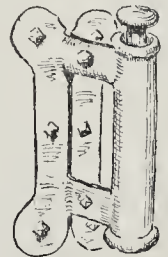
MR. ARTHUR KEEN has prepared plans and designs for new buildings to be erected, at a cost of about 34,000*l.*, as headquarters of

the Baptist Union upon a site in the new street from High Holborn to the Strand. The new Baptist Church House will take the place of the Baptist Chapel in Kingsgate-street, High Holborn, which was established there in 1735, and is marked for demolition in the course of the projected improvements in that quarter.

Decorative Art of Primitive Peoples.

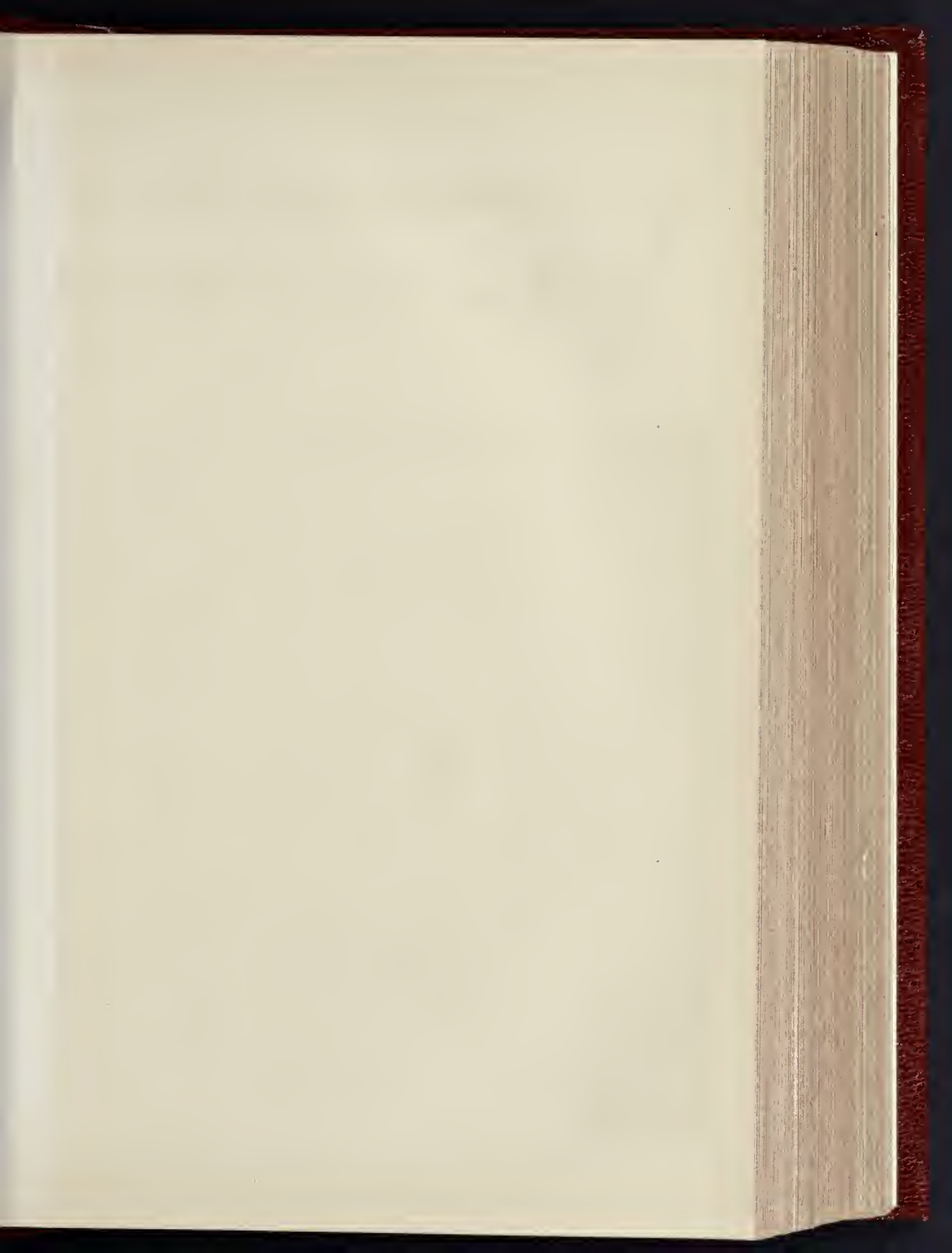
In a lecture at the London Institution on Thursday, February 14, Professor A. C. Haddon dealt with the decorative art of primitive peoples. The lecture was confined to a brief outline of the subject, and to some of its detailed developments, well illustrated by a number of photographic lantern slides. The Professor made it very clear what an important part decoration assumes in ethnology; how universal was the expression of powerful emotions, religious, warlike, and superstitious, by means of natural forms, developing ultimately into symbols widely differing in form with each race, and influenced by the local circumstances of materials and manners. These primitive arts are valuable not only for their historic significance, their quaintness of form and of invention, but also for the philosophy and reasonableness of the system adopted, of which much modern decoration is entirely innocent. The closing years of the nineteenth century saw certain changes in the value of decorative art, a tendency to study the subject more seriously, and to draw attention to its influence on character; but popular decoration is still too uncertain a quantity to be representative among other attainments of the present age. An obstacle to advance in the arts is the tendency to specialisation; the sharp distinction that is drawn between the useful and the ornamental is characteristic of the age; the average person possesses a positive knowledge of the former and a negative knowledge of the latter. The artistic and scientific inquirer have much to learn from each other before good decoration will be recognised and welcomed as a useful and necessary art.

MR. HENRY ROSE writes to us from Chard:—"I enclose a sketch of a variation of the Norfolk latch, which is quite new to me. I do not think that you will deny it the publicity of a place in your columns. It would have delighted the soul of Viollet-le-Duc; he would have made a diagram showing how it was cut out of a single sheet, and had a ring welded on at each end of the hollow handle. It occurs on the external door of a

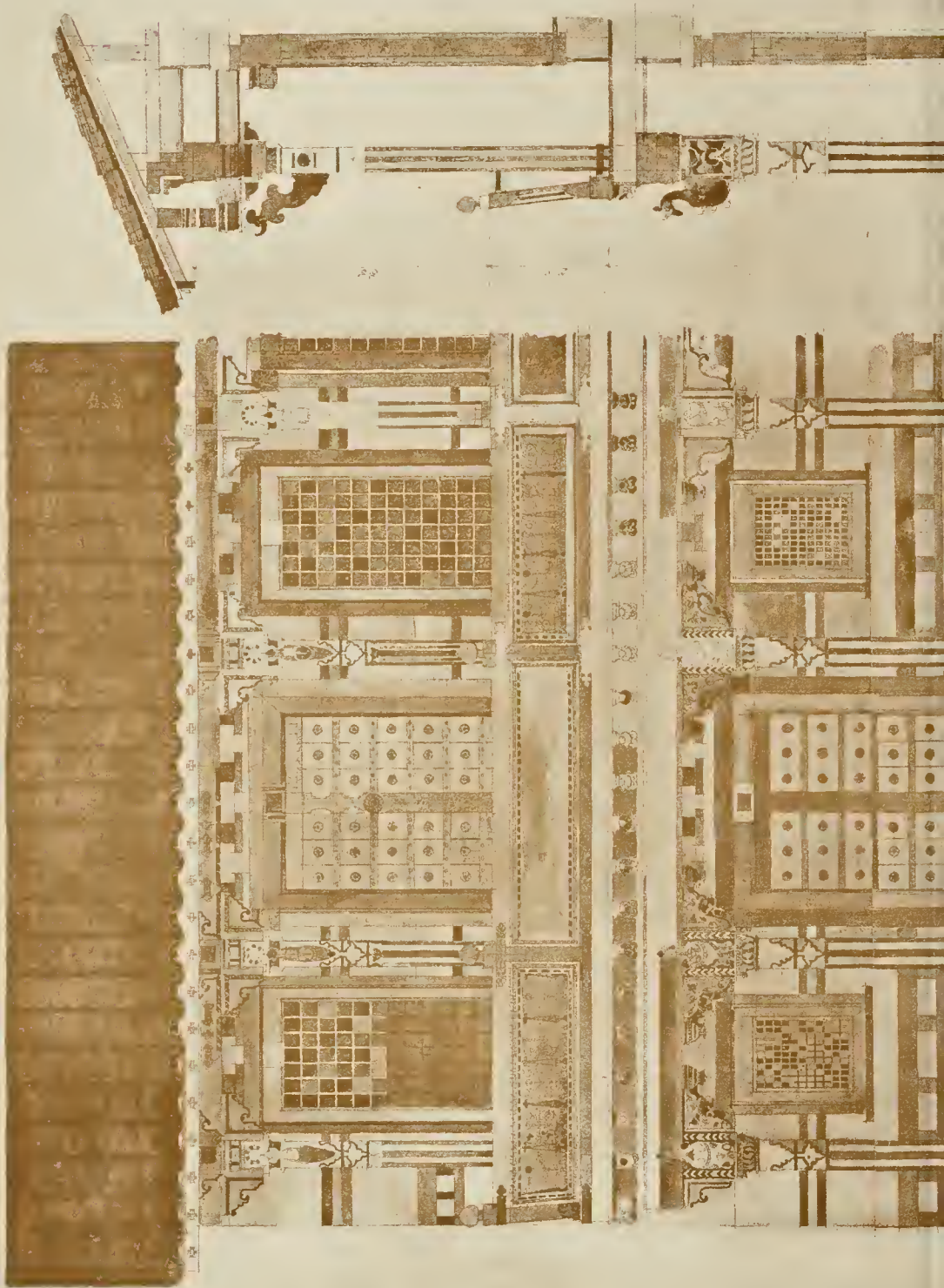


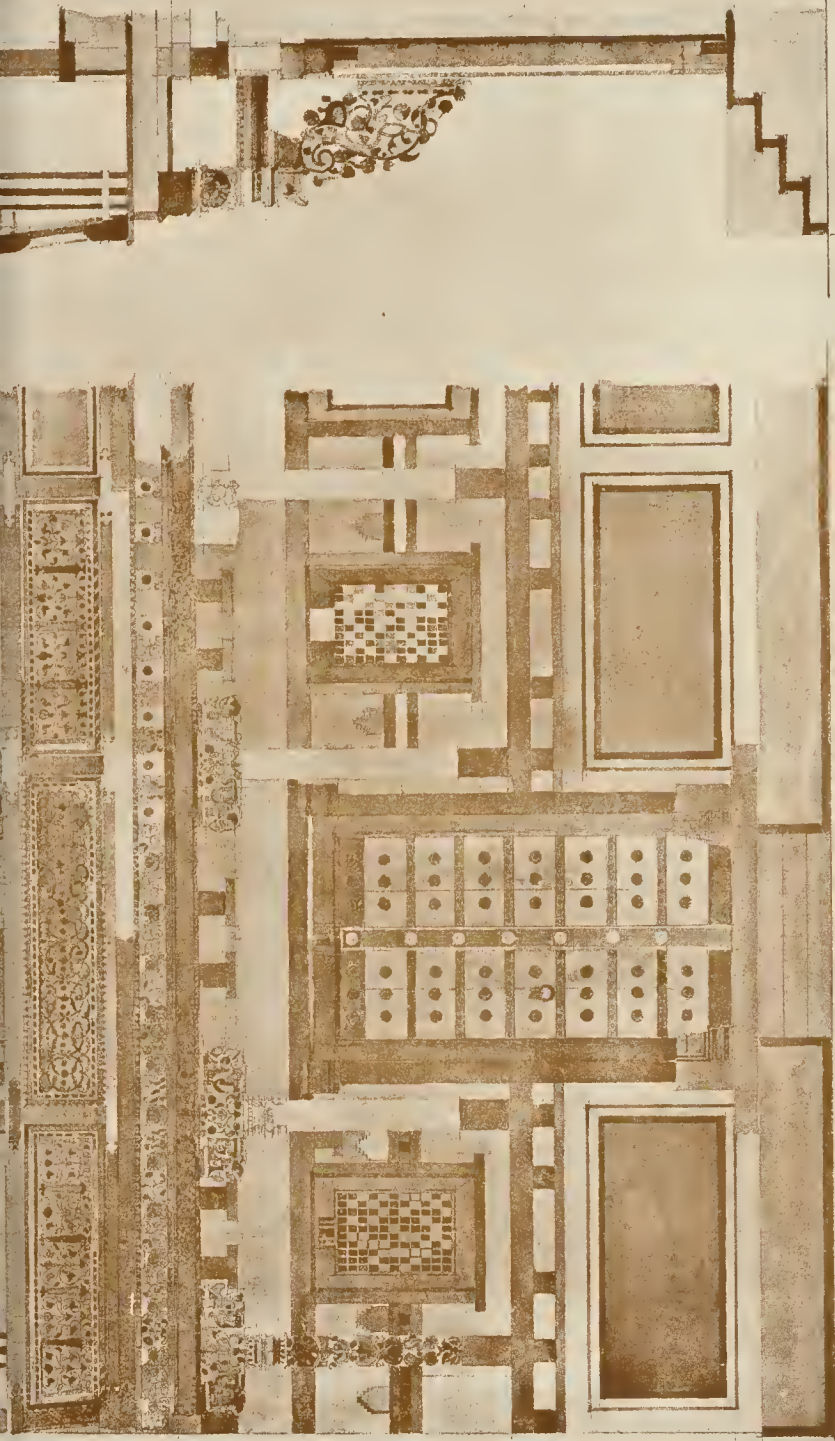
An Old Somersetshire Thumb-latch.

very dilapidated little cottage about two miles from here, which will probably be swept away ere long—the thatched roof



THE BUILDER, FEBRUARY 23, 1901





Part-Front-Elevation.

Section-into-Front

Designed and Drawn by
Hervey-Ratcliff Ford
1900-0

FEET



SCALE OF

INK PHOTO, SPRAGUE & CLEGG, 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

(Queen Joints Press, R.L.B.A., 1901.)

STUDY OF AN INDIAN HOUSE



as disappeared already; meanwhile, it is covered in with corrugated iron, perhaps more in character with the lath. Little isolated districts of three or four cottages have names about here, the one in question is Paintmoor. As to the date of the lath, I know nothing—probably last century."

The small sketches in water-colour by Mr. Wilfrid Ball, of scenes in Cornwall, Devon, and Somerset, now on view at the Fine Art Society's Gallery, form a charming collection of landscape studies of great truth and delicacy. Many of them are coast scenes,—an expanse of sand with the sea beyond, a kind of subject in which the author is specially happy. Among the best of these are "Whitesand Bay" (2); two sketches at St. Columb's Porth (12 and 17); "Calm after Rain, Sennen" (21); "Clear and fresh, near Port Isaac" (25), a dark sea behind a flashing white breaker; and "Sea Pools, near Sennen Cove" (40). Some of the inland subjects are also admirable studies of tone and atmospheric effect; "Colyton" (33) is a beautiful miniature landscape study; and "Short Cut by the Cliffs, Berry Head" (47); "South Devon farmstead" (58); and "A Spring Day" (65). Mr. Lee Hankey's collection of drawings at the same gallery we are not very much taken with; the style is too woolly and the colour in many of them not agreeable or (to our thinking) natural. "The Empty Basket" (30) is a well composed little picture of artistic quality; "The Kindling Dawn" (19) is a good landscape study. But we were not able to feel very much interested in the collection as a whole.

A Mission Church Competition. An architect sends us a characteristic circular which has been sent round among the architects of the district in regard to a proposed new mission church for Melton Constable. The building committee invite designs and estimates "to be submitted or their approval. "While economy must be strictly studied, the committee do not bind themselves to accept the lowest estimate or any of the plans submitted." The document proceeds to point out that sketch-plans will suffice in the first instance, "but they must be sufficiently detailed to give a fair idea of the general design and construction, and should include four principal elevations, one longitudinal and two transverse sections, and ground plan." No premiums are offered, and all this is to be done on the chance that the committee will deign to make use of one of the designs!

PLAISTOW PUBLIC BATHS.—Public baths have been erected by the West Ham Corporation in Balaam-street, Plaistow. The baths have been built by Messrs. Spencer, Santo, & Co., from plans prepared by the architect, Mr. Saxon Snell. Mr. Gardner was the clerk of works. The exterior is of Portland stone relieved by red bricks. From the entrance hall branch off to the right and left the swimming baths. On the left is the first-class swimming bath, some 150 ft. long, round which runs a gallery with a balustrade in front. On the right-hand side of the entrance is the second-class swimming bath. This is 60 ft. long and 27 ft. broad, and the depth ranges from 4 ft. to 7 ft. There are sixty-two dressing-boxes to the first bath and fifty-two to the second. In between the two are the slipper baths, some twelve in number, while at the rear is the establishment laundry, close by the engine and boiler houses. Going up from the sides of the entrance hall are two stone staircases, the one leading to the ladies' first and second class private baths, ten in number, and the other leading to the gentlemen's baths, which are rather more numerous.

WHITCHURCH ASYLUM COMPETITION.

The drawings of the five selected designs in the final stage of the competition for the Cardiff Asylum at Whitchurch, Glamorgan-shire, were on view in the Council Chamber of the Town Hall, Cardiff, last week. The site is conveniently situated a few miles north of Cardiff and Llandŷn, in pretty country, bounded by the Merthyr-road on the east, the Glamorgan canal on the west, and the new Cardiff railway to the north. The institution is proposed to accommodate 1,250 patients, of whom only 800 are to be provided in the first instance, but the plans show the complete scheme. The distribution of the several classes was left to the discretion of the competitors, who were furnished with copies of the instructions, and suggestions issued by the Lunacy Commissioners, as the basis of the arrangements. Mr. G. T. Hine, who acted as the assessor, in advising the Corporation in both competitions, reported that No. 56, the design of Messrs. G. H. Outley and W. S. Skinner, of Bristol, was the best and more closely followed the instructions than any other. In this selection we fully concur. The plan is an able exposition of the requirements of such an important undertaking, and is evidence of much skill, without doubt the product of matured experience.

The lay-out is naturally based upon the imperative considerations of aspect, allocation of classes, administrative supervision, and easy extension. The skeleton of the plan is formed by the main arterial corridors, which would almost make an equilateral triangle, wide at the top and cut off before reaching the bottom. This is intersected by the only horizontal corridor which runs across the plan, with the kitchen as a centre; the other corridors intersect at obtuse angles, the two lower ones being curves, all of which connect the several blocks. The principal entrance is at the top of the vertical axis, while the assistant medical officers' quarters, a detached building, is at the bottom. Commencing at this latter point and ascending, the arrangement of the heart of the triangle may be thus described.

The assistant medical officers' quarters are connected by a long passage to the main building front, which is occupied by the matron's quarters, dispensary, pathological-room, &c. Areas supervene between this and room, &c. Areas supervene between this and the recreation hall, which is also used for dining purposes. This is a large apartment, 100 ft. by 50 ft., and is provided with a stage and dressing-rooms, this is placed longitudinally upon the plan; a hall scullery with large areas on either side part it from the kitchen, which has convenient serving lobbies at either end, and provides messroom, cooks' room, and other offices. At this point is reached the corridor before referred to, which bisects the plan horizontally.

Above this, parted by the large kitchen-court, is the steward's department, which is spaciouly arranged with gallery over, both this and the kitchen-court have suitable cart access. A corridor lighted on one side, having on the other bakery, cooling-room, and other offices connected with the steward, leads to the official block, which is at the top of the plan, having servants' quarters over. Behind the official block to the left are the laundries, with ample drying-grounds, the boiler-houses, machinery, and yards. On either side of the recreation-hall and kitchen are vertical corridors off which on the left in convenient proximity are the attendants' mess-rooms below, and the servants' mess-rooms above; while on the corresponding side to the right are the provision stores placed on the kitchen court side. We have thus outlined the arrangement of the interior or administrative part, around which are grouped the blocks occupied by the patients in their several classes; the females on the left the males on the right.

The sick and infirm blocks are naturally kept at the bottom, near the medical officers' quarters, while the noisy patients are placed where least inconvenience will be felt, the bath-houses being conveniently placed off the corridors. The arrangement of these blocks has been admirably conceived, each being placed at an obtuse angle and in echelon to gain the maximum of sun light to the day rooms, which are provided with large bays, and the wards. There are some points, however, for criticism; among which may be noted the arrangement of the beds in the sick wards, and the planning of the sanitary towers, which might be improved upon.

A strong point in the design, and one upon which too much emphasis cannot be laid, is the able way in which the staircases and the accesses have been arranged, forming an integral intention in the design, for the direct and unhindered exit in one of two or more possible ways in case of fire or panic. The extensions comprise a large block at the top point on either side, where such can be conveniently made; the other—i.e., female 68, and males 42—are within internal courts which it will be inconvenient to reach. Of all the designs, this seems to be the most economically one arranged, and open with free surrounding air and withal compact.

The remaining buildings are spread over the site in the following disposition. Above the official block on the central vertical line, and parted therefrom by the broad entrance drive is the chapel, to the right of which is the steward's house. Above the chapel, with an intervening space of 30 yds. is the mortuary, and on the same axis, 70 yds. higher up still, is located the isolation hospital. To the right of the steward's house, and near the Merthyr-road, are quarters for the clerk of works, gardeners, and engineers, besides a group of six cottages and the entrance lodge. The medical superintendent's house is on the opposite side of the site, detached, overlooking the Glamorgan Canal.

Little remains to be said about the architectural character, which is strictly utilitarian, and very depressing. We venture to hope some attention will be given to the necessary and healthful element of beauty in pleasing and simple outlines and detail, which is surely absolutely necessary in such an institution. The dominating feature is the small water-tower with the adjacent chimney-shaft; these might be combined as there is an ample pressure, and but two days' storage is required for emergency. The remaining features are the various louvred ventilating-shafts, which are carried up some 20 ft. above the ridges.

The total estimate is 235,000/., which is about 188/ per bed for the complete scheme; the first portion being 194,000/., or 242/ 10s. per bed. This estimate, together with those of the other competitors, the assessor considers to be too low.

No. 57. Messrs. Wills & Andersen, of Swansea, have a good plan, with many excellent points and much evidence of a grasp of the subject. The disposition of the blocks and the corridors is, however, not so happy as in the selected design, besides exhibiting major and minor defects. The plan covers more ground, being about 200 ft. wider at the top. The extensions would not come in quite as conveniently as they should do. The elevations are very pleasing, an important element much lacking in the selected design. A simple and artistic detail of one of the principal elevations is shown; all of the drawings are admirably rendered.

No. 54. Messrs. J. H. Greenaway and J. E. Newberry have also an excellent set of drawings, the receding elevations being very effectively delineated. The planning and general disposition, however, do not exhibit that virtue of economy which it is so necessary to have and difficult to attain. The central portion is well arranged in a parallelogram, and is compact and well balanced, while the extensions are suitably considered; but there is much lost space in the large open courts.

No. 53. Messrs. Hooley & Sander, of Nottingham, have a plan not unlike Claybury, which is very well laid out, but rather suggests a treatment for a larger establishment than that proposed, and is much spread out. The elevations are quite unadorned and unelevating.

No. 55. Messrs. Law & Allen, London, have a full and carefully worked-out plan, with a long front-block, while the infirmaries seem to be about the best arranged in the whole competition, although here, also, the arrangement of the beds leaves much to be desired. A good and complete scheme of farm buildings has also been included by the authors, which the other competitors have not done. The buildings have a distinct architectural treatment, which has been well shown.

STATUE OF QUEEN VICTORIA, HOVE.—A statue of the late Queen which has been erected at the foot of Grand-avenue, Hove, was unveiled on the 9th inst. The statue is 13 ft. in height, and of bronze. It stands on a pedestal, 14 ft. in height, of grey Aberdeen granite. The statue was originally intended as a Diamond Jubilee memorial. Mr. Thomas Brock was the sculptor.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held on Monday evening last at No. 9, Conduit-street, Regent-street, Mr. E. A. Gruning, Vice-President, presiding, in the absence of the President, Mr. W. Emerson, through indisposition.

The Late Queen.

The minutes having been taken as read, Mr. W. J. Locke, Secretary, read the President's remarks on the death of the Queen, the members all standing. "Gentlemen," said the President, "I must ask you all to rise for a moment as a tribute of respect to our late great Queen. Since last we met together here, a most solemn and soul-stirring incident has occurred. The Empire has sustained an incomparable loss. The Victorian era, a most memorable epoch, has passed. The British Empire and the world in general, wherever civilisation exists, is mourning the death of our late Sovereign. Europe, Asia, Africa, America, and Australia have been deeply touched, and have all given kindly expression to their profound sympathy with us. It is not only the loss of a great ruler that is mourned, but also the loss of an inexpressible influence of a good, religious, wise, and gracious lady, and of a sympathetic woman. Who can have read without having been deeply touched her oft-repeated solicitude for those in distress, whether her soldiers, sailors, or others, of her subjects. Our late Queen's influence must necessarily have been greater than that of any previous monarch in the world's history. For Queen Victoria's Empire has been the only one in which influence, whether for good or evil, could have been felt over an extent of territory so great that in it the sun never sets. But we as members of this Institute have even a closer tie, a deeper cause for mourning. Her late Majesty was not only our beloved Queen, but also our most gracious, beneficent patron. Her kindly interest in us commenced with the action of her Royal Consort in our foundation, and has been evinced from time to time during the whole of her long and glorious reign. Those who have had the honour of receiving from this Institute the Queen's Gold Medal for Architecture will cherish no possession more highly. It is a memento of the greatest Queen the world has seen, and also of the kindly encouragement her late Majesty so beneficently extended to influence for good our art of Architecture. Her reign has been the most memorable in the annals of this country for the marvellous increase of her Empire, and its unrivalled prosperity, as well as for the unprecedented advancement in learning, science, and art. I feel sure there is not one amongst us who not only deeply sorrows, but who must also feel a loneliness at heart at the loss of our late beloved Sovereign Queen Victoria. There is a great blank.

But in our grief we have happiness in welcoming our King's accession. From his known affection and sympathetic understanding of his people, his careful attention to his duties, and his gracious promises to follow in the footsteps of his Royal mother, we feel every confidence that he will so wisely rule as to endear himself to his subjects, who will entertain the deepest feelings of loyalty and devotion to His Most Gracious Majesty King Edward the Seventh. God save the King!

As a matter of form I must ask you to ratify the action of your President and Council in sending to his Majesty an Address expressing on behalf of this Institute and its allied Societies the sincere expression of our sorrow and loyalty. The Address is as follows:—

The Humble and Loyal Address of the R.I.B.A. to His Most Gracious Majesty the King.

May it please your Majesty,—

We, your dutiful subjects, the President and Council, on behalf of the members of the Royal Institute of British Architects and of the societies both in the British Islands and the colonies in alliance therewith, beg leave humbly and respectfully to approach your Majesty, and to offer our deep and heartfelt sympathy in the inexpressible loss your Majesty, the members of the Royal Family, and the nation have sustained by the death of your Royal mother our late Most Gracious Sovereign Queen Victoria of glorious memory. Her late revered Majesty encouraged with her Royal and generous patronage the art that is so dear to us, and we mourn with deepest sorrow, not only in common with the rest of the

British Empire, our beloved ruler, but also the gracious and beneficent patron of the Royal Institute throughout the whole length of her long reign. We most respectfully and dutifully tender to your Majesty our sincere devotion and loyalty on your accession to the Throne, and earnestly pray that the Almighty will grant your Majesty and your Royal Consort Queen Alexandra a long, happy, and glorious reign, during which the nation may prosper, the arts flourish, and your Empire enjoy all the blessings of peace."

The Royal Gold Medal.

The Chairman said that under ordinary circumstances that would have been the night on which the choice of the Royal Gold Medalist for the year would have been announced, but under the circumstances it was impossible to do so. The Royal Gold Medal was a personal gift of their late revered Sovereign, and with her death that gift ceased. Time did not allow them, nor would it be politic, to approach his Majesty the King on the subject, and therefore for the present and for this year the award would remain in abeyance. The continuance of the presentation depended entirely on the wish of the King, and the Council of the Institute intended to make application in a proper manner in the hope that the award of the medal might be continued in the future.

Elections.

The following gentlemen were then elected: As *Fellows*—F. S. Baker, Toronto; A. C. Blomfield, M.A., London; C. J. Blomfield, London; G. F. Collinson, London; William Flockhart, London; John Leeming, London; and Joseph Leeming, London. As *Associates*—T. B. Ball, Weston-super-Mare; E. W. Banfield, London; G. Brumell, Morpeth; H. M. Cautley, London; W. G. St. John Cogswell, London; W. E. B. Froome Crook, London; H. A. Douglass, Brighton; T. W. Gordon, Nottingham; A. H. Goslett, Great Stanmore, Middlesex; S. Harrison, Leicester; C. E. Hutchinson, London; A. L. MacGibbon, Edinburgh; R. H. J. Mayhew, Anerley, S.E.; W. V. Morgan, Carmarthen; R. Wynn Owen, Liverpool; A. Wyatt Papworth, Maida Hill, W.; J. Quail, Manchester; F. J. Osborne Smith, London; E. J. Tench, Cambridge; C. Boswood Thomas, London; H. A. Tinker, London; P. J. Turner, London; W. J. Walford, Anerley, S.E. As *Hon. Fellow*—Sir Lawrence Alma-Tadema, R.A., F.S.A.

Asylums and Asylum Planning.

Dr. Hayes Newington then read an exhaustive paper, prepared by Mr. G. T. Hine, on "Asylums and Asylum Planning," of which the following is an abstract:—

Mr. Hine said that asylum construction embraced the study of almost every description of building, from a church to a cow-shed, and the art of combining so many dissimilar structures into one harmonious whole, with the engineering skill necessary to provide for and supply heat, light, and water to what is practically a little town, made asylum architecture an almost distinct profession in itself. Further, asylums are built for people who have to be watched, nursed, and provided with employment and recreation under conditions inapplicable to sane people, and to provide for all these, while the subjects are under enforced detention, a very special knowledge is required to make their lives bearable, and, as far as possible, pleasurable. In order to make his paper of some use to the student of this branch of architecture, he proposed dealing chiefly with asylums at home and their most fitting form of planning, and referring to some of the most interesting examples in foreign countries.

Starting with a brief historical sketch of the building of public asylums, the author stated that there was no certain evidence of asylums for the insane before the Middle Ages. Early in the fifteenth century there is record of a most sumptuous building erected in Cairo for the exclusive use of lunatics. In 1641 the asylum of Notre Dame de la Paix at Charenton was founded for the reception of lunatics, and is now one of the largest of such institutions in France. In 1660, in the Hôtel Dieu at Paris two small wards were set apart for the mentally afflicted. Ghent, in Belgium, has been a resort for lunatics for many centuries. Here patients were brought to be cured, boarding with the peasants of the district, and from this has gradually developed a colony of resident lunatics, numbering to-day nearly 2,000, who, while still chiefly boarding with the inhabitants of the place, are under a strict code of regulations framed by the Government. In

England there are records of an asylum for the insane at Barking, founded in 1370. Bethlehem Hospital was founded in 1247, but it was not till 1403 that we have any record of lunatics being received there. Of other early buildings of the kind in this country were St. Peter's Hospital at Bristol, founded in 1606; the Manchester Royal Lunatic Hospital in 1706; Bethel Hospital, Norwich, in 1713; St. Luke's Asylum, London, in 1751; and the Liverpool Lunatic Hospital in 1792.

Up to the end of the eighteenth century such lunatics as were not at large were confined in prisons or in the few houses then erected for their accommodation, and were frequently treated worse than felons, often with the greatest cruelty. But in the year 1796 the "Retreat" at York was founded by the Society of "Friends," an institution where an intelligent system of treatment was initiated and carried out under the able direction of Mr. William Tuke. This institution and the novelty of its treatment constitute a landmark in the history of lunacy. It roused a spirit of inquiry into the housing and care of the insane, which resulted in the passing of an Act in 1818 permitting county justices to erect asylums for the accommodation and treatment of pauper lunatics. In 1845 another Act was passed, making it compulsory on local authorities to provide asylums for the insane in boroughs and counties throughout England and Wales. This Act established the present Lunacy Commission with six paid Commissioners, whose work of inspection and direction has done so much to ameliorate the condition of the unfortunate people under their care. In 1845 there were only about thirty pauper asylums and hospitals, the latter chiefly for private patients, besides a number of registered houses, and, as nearly as could then be estimated, about 17,000 pauper lunatics in England and Wales. Now (in 1901) there are no fewer than 100 county and borough asylums and hospitals, together with something like seventy registered houses, all of which have to be inspected once—in some cases four times—a year, and 107,000 certificated lunatics to be interviewed by the Commissioners. Scotland and Ireland have also their separate Acts relating to lunacy—in Scotland on somewhat similar lines to those in this country, with a Board of Commissioners; but in Ireland the construction and direction of asylums are more directly controlled by the State.

Turning to the actual buildings, the author described some of the most notable erections since the Act of 1845, indicating the various stages in the evolution of asylum planning, a study of which is essential to a proper appreciation of its latest developments. Existing types of plan are all more or less developments of the corridor and pavilion systems. In the early days the corridor system, consisting of a long gallery, with single rooms opening out of it, was the only recognised principle on which an asylum could be built. The form was usually quadrilateral. After the Act of 1845, while the internal arrangements savoured less of restraint, the principle of the corridor system still prevailed. The first development was an attempt at classification by the introduction of a ward for the sick and infirm on each side of the building; the number of cells was reduced and more patients were allowed to sleep in associated dormitories. In the seventies special provision began to be made for epileptics, and the Lunacy Commissioners in 1874 published a plan designed by Mr. Howell for an epileptic ward, which has been adopted with trifling variations in nearly every asylum designed within the last twenty years. In the decade 1871-80 the most notable departure in planning is met with in the Lancashire County Asylum, at Whittingham, designed in what Burdett describes as the corridor-pavilion style, and characterises as one of the finest specimens of asylum architecture in England. The Gloucestershire second county asylum, erected on the pavilion system, the blocks being arranged in echelon, was the first of this type erected in England, and may be said to have originated the oblique or broad-arrow form of corridor now so commonly adopted in asylum designs. The Surrey second county asylum at Cane Hill, one of Mr. Howell's chief works, and accommodating 2,000 patients, is on the pavilion type, the blocks radiating from a main corridor of horse-shoe form. Criticising the variation of floor levels in this building, which necessitated flights of steps in the corridor, the author was of opinion that this irregularity could have

been avoided by a more careful consideration of the surface levels of the ground, and a little more excavating. He urged architects designing asylums to give a first consideration to the site. In many of the plans coming under his official notice the buildings are generally left to adapt themselves to the site rather than the site being adapted to the buildings. Describing the Claybury Asylum, designed by himself, the problem to be solved was how to accommodate 2,000 patients within reasonable distance of the administrative centre without prejudice to the position and aspect of their wards. The plan he adopted was a modification of the échelon type, the wards being approached from obtusely oblique corridors, the pavilion system being almost a necessity from the conditions issued. The asylum is built on the top of a hill, falling all ways, and by removing the apex of the mound, representing nearly 100,000 yards of soil, which was well disposed of in filling up a valley to the north of the asylum, a level plateau was obtained, sufficient to allow of about half the patients' blocks and the whole of the administrative department being erected at one uniform level, the remaining wards being slightly lower, but in no case more than 5 ft. below the central buildings. At Bexley Asylum the author first introduced the villa system on a tentative scale of three villas holding thirty-five patients each, and a detached hospital for fifty phthisical cases or others requiring isolated treatment. In this asylum, which accommodates 2,000 patients, all the wards communicate with one another, and an officer may pass from one end of the male or female side to the other without retracing his footsteps or being obliged to return to the main corridor. Bexley has proved so satisfactory that the London Asylums Committee have arranged with Mr. Hine to use the same plans, with a few modifications and improvements, for a second edition of this asylum at Horton.

Numerous other asylums were referred to, the author indicating their distinctive features and in many cases exhibiting plans.

The London Asylums Committee have found it necessary to add temporary buildings to some of their asylums. These erections, chiefly of wood and iron, provide accommodation for 1,700 patients at a total cost of about 173,000*l.*, averaging 100*l.* a bed—a costly expedient, considering the limited life of these structures.

Scotch asylums are administered by a Board of Commissioners, whose duties, though similar in many respects to those of the English Commissioners, are exercised under different laws and with different results in the planning of these buildings. The system of housing in the acute hospital the curable and incurable cases together is encouraged by the Scotch Commissioners, who consider it undesirable to separate entirely the two classes. This view is upheld by Dr. Conolly, who considers the absolute separation of the curable from the incurable to be neither practicable nor desirable—the incurable patients being generally fitter companions for the curable than the curable patients are. English medical experts, however, hold that a hospital, totally distinct and apart from the asylum, for the reception and treatment of new cases which are not diagnosed as hopelessly incurable, must prove an important factor in the cure of lunacy. It is well known that many forms of insanity are curable at an early stage, but by neglect or unfavourable conditions often result in permanent and incurable disease.

In 1889 the London County Council appointed a committee to inquire into and report upon the advantages of the establishment, as a complement to the existing asylum system, of a hospital with a visiting medical staff for the study and curative treatment of insanity. The committee held meetings, and invited leading medical experts to give evidence. Their report showed the evidence to be greatly in favour of the scheme, and they summed up strongly recommending the establishment of such a hospital. The County Council nevertheless ignored the recommendation, and have continued building asylums on the old lines. Other county authorities, however, have taken up the matter, and are providing hospitals for the reception and treatment of curable cases. The provision of an acute hospital the author considered to be one of the most important evolutions in modern asylum planning.

Touching asylums on the Continent, various plans were shown of German asylums, and interesting details given of the villa system as seen in the asylum at Alt Scherbitz, which may

be said to have originated this type of planning, now adopted more or less in modern American asylums, and more recently, but to a less extent, in England. The villas are constructed very much like boarding-schools, with day and class-rooms on the ground floor and associated dormitories above. The doors and windows are open, and the patients come and go as they please, wander about or work in the grounds, enjoying comparative freedom, but always under the watchful eye of carefully-trained attendants. No wall encloses the estate, only a light and easily climbable fence. The gardens surrounding the houses in the central establishment are enclosed with palings, grown over with plants and creepers. The colony is bounded on the south by the river Elster, which flows at the foot of a steep hill in the grounds, and there is nothing to prevent a patient rushing down the hill and plunging into the river. Great value is attached to residence in the colony, and patients are given to understand that their stay there depends on their good behaviour, and are thus encouraged to exercise self-control.

Having given an account of asylums as they are, the author went on to deal with future possibilities of asylum designing, and then to give a detailed description of an asylum as it should be, instancing a building to accommodate, say, 800 patients, with provision for future extension to 1,200. As an illustration, the plans were referred to of the new East Sussex Asylum now erecting at Hellingly, which has been designed on the most modern lines, the whole scheme having been most carefully thought out by a committee of the County Council, with Dr. Hayes Newington at its head, whose wide experience, acquired in many years' association with asylum work, gave his committee an immense advantage in determining the basis on which they should work.

To understand the first principles of asylum construction, it is necessary to know something of the eccentricities of insanity and the habits and treatment of the insane. The author recommended the student in asylum planning to make friends at all opportunities with the medical experts, and to study the subject in the light of those whose duty it is to look after the insane. The architect can materially assist the doctor in both the cure and protection of the patient by the careful consideration he gives to the details of planning and construction of the asylum, and in doing this he will find that he must design buildings which give security without appearance of restraint. The ever-present sense of detention is, in a way, as inimical to cure as were the cells and fetters of the eighteenth century.

In the ideal asylum the most important building must be the acute hospital. Here it is that every patient, unless hopelessly incurable, is admitted, and during his stay in this hospital his future life is probably determined, whether he shall recover and go back into the world, or whether he shall pass on to the main asylum for the remainder of his days, to eke out an unhappy existence at a cost of more than 30*l.* a year to his country. On every ground we cannot afford to neglect anything—consideration, care, or money necessary to produce a building—which affords the doctors the best opportunities for treating and curing their patients. Any money thus spent will prove the truest economy in the end.

The various parts of his ideal asylum having been discussed in detail, together with the engineering works, internal fittings, laundry, systems of heating and ventilation, &c., the author concluded his paper by a reference to the cost. He was of opinion that a well-built asylum, designed on liberal principles, and fitted with all modern appliances, cannot be erected for much less than 300*l.* a bed. Twenty-five years ago Nottingham Borough Asylum cost 170*l.* a bed. But that the increased cost is not out of proportion to that of other building works is shown by the report of the Metropolitan Commissioners, where the cost of fifteen asylums erected before the year 1845 is stated to have averaged 200*l.* a bed, some even then approaching as much as 300*l.* a bed.

Dr. E. M. Cooke, one of his Majesty's Lunacy Commissioners, said it gave him much pleasure to propose a vote of thanks to Mr. Hine for his valuable address. No medical man who had watched the subject could fail to appreciate how much they were indebted to the members of the architectural profession, and in particular to Mr. Hine, for the excellent accommodation now provided for the insane poor. There were

critics who said that we were working too much in a groove, or too slowly, in regard to the planning and construction of our asylums, and that we were behind other countries, and Germany especially, in our slowness to adopt the cottage style of building rather than those of the usual institutional type. He, however, thought that we had been wise in hesitating to make any great change in the principles of hospital construction. It must be borne in mind that many of the so-called lunatics in German asylums were of a very mild type, and in this country they would not be considered suitable for asylum treatment, but would be dealt with in workhouses, or would remain in their own homes. He thought it did not follow, therefore, that what had been found necessary in an asylum like that at Alt Scherbitz, where the cottage system was largely in vogue, would answer in this country. He was in favour of having in all asylums of any size, a separate or detached building or hospital for the segregation and special treatment of all cases which presented any prospect of cure, but he by no means agreed with the idea of locating in scattered villas all, or nearly all, the chronic cases of an asylum. He was convinced that such a plan must add to the difficulties of administration and supervision, and tend largely to increase the cost of maintenance. In every asylum there were, no doubt, a certain number of well-behaved chronic lunatics, at the outside not more than 10 per cent. of the population, whose lives could be rendered happier in buildings more like their own homes, and for these detached cottages might be built; but he would continue to treat the great bulk of the chronic cases in a large main building, as had hitherto been done. He thought that one of the greatest steps in modern asylum construction had been the splitting up of the acute wards in which the noisy, violent cases were located, as was done in the Headingly Asylum, where the acute ward had very wisely been divided into three small rooms, so that the number of patients in each would be comparatively small. Such a system must, he felt sure, tend to reduce excitement and prevent difficulties amongst the patients. He thought a little more attention was needed in regard to single rooms. In many of our old asylums, of the badly-ventilated, badly-lighted, and badly-warmed kind, the single rooms were occupied by the noisy, violent patients and those who were degraded in their habits. It was most essential that there should be no corners, cracks, or flues where any filth could lodge. Mr. Hine had indicated a preference for the plenum system of heating wherever it could be adopted. His (the speaker's) experience tended to make him prefer steam coils. He was against flues wherever they could possibly be avoided in asylum construction; so many of the patients had such unfortunate habits that, although architects might do their best to put the flues in such a position that they could easily be cleaned out, in practice they were not cleaned out, and sooner or later they became sources of much that was objectionable. He did not think sufficient attention was paid by some architects to the size of the airing courts, and in one or two recently-constructed asylums the airing courts were cramped and prison-like, and the patients when turned out were huddled together and surrounded by iron fences, in some cases 7 ft. high.

Dr. Urquhart, in seconding the vote of thanks, said that those who practised in these asylums had a very high opinion of Mr. Hine, who had for some time been an hon. member of the Medico-Psychological Association. Mr. Hine had been very modest in his paper, as he (the speaker) was reminded in thinking of Claybury Asylum. The site of that was an extremely difficult one, as the architects who entered into competition discovered. The valley at the top of the hill was some 80 ft. deep, and it required a good deal of consideration and time to solve the problem. But even Claybury was getting old-fashioned. We had gone from the West Riding, Wakefield, Asylum—which was an extremely interesting building to all architects as one of the earliest asylums planned by an architect in conjunction with a man who had had practical experience with the insane, and it became the model of many asylums in this country, and was at the time it was built a very great advance in England in regard to asylum planning. That building was still in use to-day, although it had been varied in many respects. It embodied

the germ of the notion shown in the East Sussex Asylum, and if any architect was desirous of knowing what was the best and latest in asylum work, he should study the detail and plan of that building; doctors thought the building was as far as could be gone on the lines laid down. Perhaps the best American asylum was the St. Lawrence State Asylum, which was a collection of small asylums, probably containing 300 or 400 patients each. The cost was enormous, and the idea had not been imitated there. In England lately the process of devolution had gone further, and, as Mr. Hine had mentioned, a scheme had been prepared for the Edinburgh Parish Asylum, though the ratepayers were up in arms against it, and he did not know whether those charming villas and cottages and the village church, hall, and reading-rooms would be carried out. The Aberdeen Council and Mr. Marshall MacKenzie, their architect, had decided that their new asylum should be built entirely on the segregated principle. On the subject of heating, in a small town in America he had visited the whole town was heated by steam from central boilers, the inhabitants being charged so much on the ratable value of the houses they occupied, and they themselves turned on the steam for heating. We move more slowly in this country, but Mr. Hine had inaugurated that system in the asylum world, and, no doubt, the sane population would have the advantage of it later.

Mr. Clifford Smith said that the temporary buildings referred to were, he knew, not altogether beloved by architects, seeing that they were built of galvanised iron. Yet the great idea in constructing temporary buildings was not so much to save money as to get speed of construction. It was desired to get buildings rapidly, and the only way that could be done was to put up those that could be speedily constructed, and without any special preparation of plans; and, as a consequence, the ratepayers spent 173,000*l.*, at the rate of 10*l.* a bed. Therefore, though they were comparatively costly, yet for the reason that the London County Council wanted them they were cheaper at the time, because they accommodated people who otherwise would have been sent out of London, and therefore they served their purpose. With regard to the question of asylums, he had had occasion to visit some of the more ancient asylums belonging to the London County Council—Hanwell, to wit—and he must say that he never went from Hanwell to Claybury without being struck with the charming difference in favour of Claybury. The difference was so very marked, and the advantage so very patent, that nobody with a trained eye, or even without a trained eye, could fail to appreciate the improvement that had taken place during the period that had elapsed since the Hanwell Asylum was built, 1831, to the time of the building of Claybury in 1887. The difference was most marked, and the advantages to the people were as great. Again, an asylum well designed was more cheaply maintained; heating, electric lighting, cooking, laundry-work, hot-water service—all these points represented hard cash, and he was bound to say that Mr. Hine had given them in these respects the greatest advantage that they would get in their modern asylums in comparison with the older ones. With a central boiler-house, and the whole arrangements radiating therefrom, they got the maximum result with the minimum of expenditure. With an asylum accommodating 3,000 patients they had to write off one and a half to two tons of coal per patient per annum, and it would be seen at once that if there could be any economy at all in a pound of coal extending over 4,000 tons a year—if they could get another ton of water raised to a pound of coal—there must be a gain; and at Claybury they had all these benefits, and they showed an improvement on the Heath Asylum. Mr. Hine rather surprised him when he stated that while he advocated the use of a central boiler-house and the utilisation of exhaust steam, yet at the same time he did not think electricity should be used for driving machinery. He thought Mr. Hine had concealed that secret very well. It showed how considerate he was to those who were called upon to work with him, when he had allowed him (the speaker) to have his own way at Heath Asylum in that particular respect. It was probable, however, that they should be able to make a comparison between the arrangement Mr. Hine had adopted in the new asylum and the arrange-

ment they would probably adopt at Heath Asylum. With regard to heating, Mr. Hine advocated the plenum system where suitable, and Dr. Cooke spoke of steam heating without flues. His experience was—and he had had to deal with seven of the London County asylums, where they had installed almost every type of heating—high-pressure water, low-pressure water, the plenum system, the semi-plenum system, low-pressure steam, and medium-pressure steam—that the low-pressure steam arrangement, with a radiator in the wall and the pressure immediately behind it, and with a proper outlet for vitiated air, gave the best result, the condition being always established that too high a pressure of steam is not maintained in the radiator, to "burn the air," if he might use that expression. He found that if they did not exceed 205 degrees in the steam radiator they got very satisfactory results, provided there was a proper fresh-air inlet.

Mr. P. Gordon Smith said that in looking at some of the plans he was somewhat puzzled as to the arrangements which were best for adoption. For instance, he was troubled very much in regard to aspect in some of these buildings, for what appeared right on one side for aspect must be, it seemed to him, wrong on the other side. He was surprised, also, at the construction of wards for four rows of beds in these new asylums, for he knew that in 1867 a committee known as the Cubic Space Committee condemned that form of ward, and the Local Government Board had for some years given up sanctioning that form of ward for Poor Law buildings; and yet it was found in the up-to-date asylum—a Poor Law building of another kind! In regard to the isolation hospital, he did not understand why they should be different from those of an ordinary village community; in one of the plans there seemed to be no arrangement for isolating one disease from another. Perhaps it did not so much matter in a lunatic asylum, where there was such absolute control over the inmates and so little chance of their contracting infectious diseases. Still, the arrangement was very different from that advocated in the Local Government Board memorandum on the subject of isolation hospitals.

The vote of thanks was then put to the meeting and heartily agreed to.

Mr. Hine, in reply, said he agreed with Dr. Cooke's suggestion that more attention should be given to single rooms; but when it was considered that a fourth or a fifth of the whole number of patients in an asylum occupied single rooms, it would be seen that great increase in the space would be required, and the difficulty of planning would be greater, and also the cost of those single rooms required to be enlarged. Architects, who knew the great cost of building asylums, shrank from adding largely to the expenditure, as they would do if they increased the size of so many rooms. With regard to the statement that he was in favour of the plenum system of heating, he was afraid the words he used were a little misleading. He said that there were advantages in the plenum system over others, and he thought there were; but there were also great disadvantages. If they could get the plenum system without its disadvantages, he should say it would be quite an ideal system. Perhaps he might refute the suggestion best by stating that he had erected eight asylums since the one referred to, and in not one of these was the warming on the plenum system. With regard to the question of aspect, referred to by Mr. Gordon Smith, he should be glad if Mr. Smith would suggest how they could get a perfect aspect to each ward. No doubt, if the asylum could be extended all over the country a perfect aspect might be secured. But it must be remembered that each block must be brought within reasonable distance of the administrative centre, and one could only give the best aspect one could under the circumstances. As a rule, the best aspect was given to the day-rooms of the patients. Mr. Gordon Smith had also called attention to the dormitories with three or four rows of beds. In hospital wards and wards where patients were in bed in the day time, it was never usual to construct them with more than a double row of beds. In wards which require supervision at night it was necessary to get a certain number of patients within the hearing and sight of the attendant, so that it was sometimes necessary, particularly in epileptic wards, to have three and sometimes four rows of beds in a dormitory, where the patients were very rarely in

bed in the daytime. Mr. Gordon Smith, in his remarks about the isolation hospital, must have been confusing the acute hospital with the isolation hospital. He had not shown a plan of an isolation hospital, but each asylum had a small hospital for infectious diseases, where the cases could be isolated. They were constructed very much on the lines of the Local Government Board isolation hospitals.

A vote of thanks having been accorded to Dr. Hayes Newington for reading Mr. Hine's paper, the meeting terminated.

The next meeting of the Institute will be held on the 25th inst., when the President will read an address to students, and Mr. J. A. Golch, of Kettering, will offer some critical remarks on students' drawings, after which the prizes will be presented by the President.

THE WEST FRONTS OF THE ENGLISH CATHEDRALS: A COMPARATIVE CRITICISM.*

IN making some observations on the west fronts of our English cathedrals, I beg to say in the first place that I am not essentially or professedly an archaeologist, and that although many of these fronts, as they now stand, present a curious record of changes and altered intentions and interrupted designs, on some of which we may touch in passing, the consideration of them in this historical aspect is not my present object. I am inviting you to consider and compare them from a purely architectural and critical point of view. I think there is hardly enough of this purely critical spirit in our usual manner of regarding ancient and especially mediæval architecture. By "critical," of course, I do not mean necessarily fault-finding, which, in fact, is not the true meaning of the word criticism—a word often much misused; it means really rational appreciation of merits and defects. We are too much in the habit of regarding mediæval architecture from a merely archaeological point of view; finding a great interest in tracing out the causes and the history of various apparently anomalous incidents in their existing design; hunting out the original design of a Norman façade or transept end from indications built up with the later masonry, or the reasons why a string-course of a certain date suddenly stops short at a point where there seems no obvious reason why it should have stopped. All mediæval buildings of any size and extent are full of puzzles of this kind, arising from the naïve manner in which the mediæval builder totally disregarded what his predecessor had done, if it came in his own way. These innumerable little problems no doubt give a greatly added interest to the study of our cathedrals; but it is an interesting historical rather than artistic; and it has exercised, not seldom, an unholy fascination on the custodians and the restoring architect of the building. With trouble and ingenuity and much reasoning, in the sweat of our brain, so to speak, we have made some portion of the building yield up its secret, we have got a notion what the first and original builder had erected or intended to erect; and then, of course, people think, shall we not use this hardly-acquired knowledge in order to restore what was or what should have been there? We know only too well to what pernicious lengths this temptation has decoyed respectable and well-meaning persons. But even when we look at mediæval buildings purely for their architectural effect, we are too much accustomed to assume an attitude of mere indiscriminate admiration, as if we had no right to find fault with them. This is not either reasonable or altogether instructive. The architects were human like ourselves, and it is more to the purpose to regard their buildings just as we should a piece of modern architecture; and if one is finer and more effective than another, to consider why it is so, and what are the reasons of comparative failure and success. Moreover, such a comparison, as I think we shall see, leads to some conclusions which have an important bearing on our estimate of mediæval architecture, and also suggests some points in regard to the *rational* of what is called restoration.

Now there are some special reasons for selecting the west fronts of the English cathedrals for this kind of comparative criticism. In the first place, there has always been a kind of

* A paper read by Mr. H. H. Statham before the Sheffield Society of Architects and Surveyors, on Thursday, February 14.

facit feeling that the entrance front of a great building should have some special treatment to emphasise and render it effective. It is the most prominent face of the building, and the one which meets our view as we approach in order to enter it. The practical convenience, too, of having some kind of portico immediately before the entrance of a building, so that when there are crowds who may have to defile slowly through the actual entrance door they may have some cover till they can get up to it, gives an excuse for a depth of treatment and recessing for which there is often not the same excuse on any other face of the building. The entrance, too, is a peculiarly important feature, as the link between the exterior and the interior architecture. In too many modern buildings we find this recognised in a very false spirit, in buildings in which all the funds available for embellishment are expended on the principal street front, leaving the rest plain and generally carried out in an inferior material. This is the fruit of that despicable modern virtue of economy, one of the greatest hindrances to modern architecture, but a virtue especially worshipped in this practical and commercial nation. Perhaps also this vice of having show fronts to a cheap building is partly promoted by the unhappy spirit of sham and making "the best show with your money" which is essentially a characteristic of modern life. I do not recollect that there is any example in ancient architecture of a show front attached to a building the remainder of which is carried out in an inferior material. But both in mediæval and Renaissance architecture the desire to make an impressive entrance façade appears to have been a recognised object in a great majority of cases. In the Renaissance period in Italy this was so much the case that the front was sometimes built up at first with a mere bare enclosing wall to keep out the weather, until funds should be available for building a grand façade. In the case of Florence Cathedral the façade was in fact never completed till the middle of the nineteenth century; and, as you will all remember, there was a few years ago a great international competition for a new front to Milan Cathedral, which, in spite of the death of the architect of the selected design, it is, I understand, still the intention to carry out. In England this Italian precedent was followed in the case of the Catholic church called the Oratory, at Brompton, which has only recently received its entrance front. Whether this practice of leaving the entrance façade for a possibly indefinite period a mere blank wall, in the hope that a future generation will treat it architecturally, is a desirable one, may be open to question.

Apart from the general interest of entrance façades, there is, however, a particular interest, among mediæval buildings, in those of the English cathedrals, in respect of their remarkable variety of design and conception. In France the general type of design of the west front of a cathedral is very well marked, and seldom varies; two towers, and the end of the nave showing between them. But in England, except in the case of those in which a specially designed façade has hardly been attempted, there is not one which resembles another; they are all distinct architectural conceptions. I do not think the importance of this fact, in its bearing on our estimate of English mediæval architecture, has been sufficiently appreciated. I shall have a word more to say in regard to it at the conclusion of this paper.

As to the architectural morality of façades in general, there is an especial reason why some such treatment was almost necessary in the case of mediæval cathedrals. The central pointed roof, with the sloping roofs of the aisles at each side of it, is a very good and satisfactory constructional profile when seen in section, but it is an exceedingly weak profile when seen as that of the exterior termination of a building; unless in the case of a small parish church, where a picturesque simplicity is all that can be aimed at. When a building is on a large scale, and anything like grandeur of effect is desired, it is inevitable that such a profile as this should be masked in some way. This is strikingly illustrated in the west front of Tewkesbury Abbey-church, the centre portion of which is a remarkable example of the attempt to give dignity and impressiveness to the entrance by filling the whole with one immense and deeply recessed arch, one of the finest things in English mediæval architecture, and which seems like a kind of forecast of the

treatment at Peterborough Cathedral. But you cannot fail to observe what an exceedingly weak effect the sloping lines of the aisle roofs have in comparison with the bold square treatment of the centre. In this case we have two different principles of treatment combined in one front; the end of the nave roof is masked; that of the aisles is not.

We may distinguish two main principles in the treatment of the west fronts of cathedrals. Reference has already been made to the type usual in France; the two towers stopping the ends of the aisles and allowing (in general) the end of the nave roof to be seen between them; and this we may distinguish as the French type. The other method is that of erecting a screen in front of the whole section of the building and letting the roofs abut against it. This is a method so largely followed in Italy, that we may call it the Italian type. There is no doubt that the French method is the more dignified and the more truly architectural. The basement story of the towers forms a porch to the aisles in a natural and appropriate manner, and the space between them allows the gable of the nave to assert itself. When used on the great scale of height found in many of the French cathedrals, and in such a building as Cologne, for example, it has the drawback that it is impossible to produce anything at the crossing which will dominate the western towers, and the façade assumes almost too great importance in comparison with the rest of the building. The Italian method is much more manageable, and, as at Florence and St. Peter's, allows the central feature to predominate. An objection often raised to it is that it is in some sense a sham, but I hardly think it need be regarded in this light. There are so many minor details in architecture which require a "stop"—cornices, mouldings, &c. This is only the same principle applied on a larger scale—a "stop" for the whole lines of nave and aisle roofs. It must be admitted, however, that when you get to the side or to the back of it, the Italian method in its pure form, as seen at Salisbury, for instance, has a weak effect.

The English fronts can all be grouped more or less under one or other of these types, though in some cases the Italian type has been so modified and improved in its application as to nearly lose its objectionable qualities, and become an exceedingly artistic architectural development.

The problem to be solved in treating a front of the Italian type is, while masking the weak line of the triple-aisle section, at the same time not to ignore it, but sufficiently to indicate its existence by the position of doors, windows, and other features in the façade. That is the first point; the second, which applies equally to both types, is that there should be a distinctly predominant idea in the design, to which all the details are subordinated. The best and most truly architectural effect is not to be obtained by sheer richness and multiplicity of detail. There must be an effect of contrast and the evidence of thought in the design, and the absence of these qualities is not to be condoned merely because the building is six or seven hundred years old. Architecture no doubt was a different thing then, in a sense; it was more of a national and less of an individual art; but there was good architecture and bad architecture all the same; and we cannot get the best lessons from ancient architecture unless we recognise that fact, and regard it with a discriminating and not a slavish admiration.

The Durham front, of which the plan was laid out and the lower portion built, up to the level of the nave walls, about 1130 or a little later, was, like most Norman fronts, of the French type, and of extraordinarily bold and grand design. The towers, though they form porches to the side aisles, are spread out laterally considerably beyond them, and, occupying each a square of about 44 ft., while the width of the nave is only 33 ft., the proportions belonging to the section of the nave are reversed; the side masses are the widest and the end of the nave seems narrow and squeezed in between them. There is a certain falsity and bravado about this which, however, is compensated for by the broad and massive proportion of the towers. Regret has been expressed that the Norman design was not carried out completely; the effect would have been more homogeneous no doubt, and we should have escaped the somewhat incongruous effect of the late pinnacles and parapet, which

seem a too light and fanciful termination to towers of which the lower part is so sternly plain. I must confess, however, that I cannot bring myself to regret that the upper portion of these towers was completed in the Transitional period. Contrast, as already observed, is an important source of effect in a façade; and it almost seems here as if the richer yet perfectly restrained treatment of the upper stories, with their rows of arcading, supplied just what was wanting to give an effective yet not inharmonious contrast with the stern mass of the lower walls; as if the Norman artist had been employed up to the point at which his manner of work was most effective, giving a rock-like base to the towers, and the Transitional artist had stepped in just where æsthetic considerations called for his hand. He made, however, one mistake. But for his entering on the scene, it is probable that the small enriched wall-arcading which, runs across under the gable and finishes on each adjoining buttress of the towers, would have been carried right across the front, binding the whole together in a manner which is now rather wanting. It is evident that the Norman builders' work had stopped at the string below the line of this arcade, except at the centre and on the innermost walls of the towers, which had to be carried up a little higher to meet the end of the nave walls; and it is a curious example of the indifferent way in which these ancient gentlemen went to work, that the Transitional builders should have totally ignored this obvious and important feature in the design as projected by their predecessors. In the main, however, they did nobly, and I am inclined to think the towers are finer objects now (always excepting the pinnacles, which are out of keeping with the whole) than they would have been if the Norman design had been carried out complete. The weak appearance of the screen gable, which (as in many other instances in mediæval architecture) does not in the least coincide with the actual section of the nave roof, is a serious defect; and the large decorated tracery window, inserted below, though a fine one in itself, is painfully out of place there, appearing quite crushed by the mass of plain walling around it. As regards the architectural composition, it would have looked far better had the window been made to follow and fill up to the circular Norman wall-arch above it; but at that time such a piece of accommodation could not be thought of; pointed arches were the order of the day, and there was no salvation outside of them; whereby we may gauge the difference of the attitude towards architectural design in those days and in our own.

Lincoln is, in a sense, one of the most interesting of all our west fronts, though (or some may say, because) it is a kind of medley of two opposing ideas struggling for the mastery; a blend of the Italian and French types. As first planned by Remigius in the latter part of the eleventh century, it was a French front, with the preparation for two towers which, in the most orthodox fashion, marked the termination of the aisles, the internal width of the towers being probably coincident with that of the aisles, though the thickness of the tower walls gave a certain external projection. The nave was widened by 5 ft. on each side when it was rebuilt in the Early English period, and hence the inner side walls of the towers do not now coincide with the line of the nave arcade, as they originally did; but I have no doubt the inner face of the Norman aisle walls coincided, as the present aisle walls do, with the inner face of the tower walls; in other words, the outer wall of the nave was rebuilt on the Norman foundations; because a reference to the plan will show that, according to usual proportions, the aisles are too narrow; the centre compartment was widened, the aisles were not. The second stage of the west front, in the Transitional period, was the erection of gables adorned with arcading over each of Remigius's large arches, as over the three great arches at Peterborough, which the whole composition at this stage must have somewhat resembled, and perhaps even suggested it. The change came when the nave was rebuilt under Bishop Grosseteste, circa 1230, when a façade of the Italian type was planted on, and as an extension to, the Norman façade. This was all part of the ambition and emulation of the period; the effort of one establishment to outdo another in the striking character of its western façade; so that it is evident that the mediæval clergy fully appreciated one motive which has been

suggested for a special treatment of the entrance front—that of forming a kind of advertisement. Cathedrals might be dedicated to a saint, and built professedly to the glory of God; but there was as much human nature about it, after all, as in building a railway terminus: each new company tries to build a more imposing station than the last one. In the present case there was evidently some unwillingness to meddle with the bulky walls of the Norman towers; the easiest way to increase the ambitious character of the front was to spread out a screen on each side of it, so as to widen the whole composition, and then to make it rich with diversities of arcades. Finally, in the Early Perpendicular period, the towers were at length carried up and emerged from behind their screen. Up to the beginning of the last century they had small spires or spirelets, which were then removed, probably because they needed repair, and it was cheaper to pull them down; a good enough reason in the Georgian era. It should be noticed too that when Grosseteste built the new nave, the gable of which comes out through the Norman front, he altered the centre arch to a point, to harmonise with the new work. It may also be noted, in comparing Lincoln with Durham, how much more satisfactory is the effect of the gable, which really represents the section of the roof, in comparison with that fallacious gable at Durham which stands up flat by itself.

A good many harsh criticisms have been made on Lincoln front, and it cannot be denied that, as a whole, it has little claim to be considered a design; it is a picturesque medley, though a most graphic piece of architectural history. Yet I owe to it one memory of an effect that will last my lifetime. I first saw Lincoln in company with the first Architectural Association excursion organised by the late Mr. Edmund Sharpe, I do not know how many years ago. On the third day of the ceremonial we were driving back into Lincoln after a glorious summer's day spent among some of the neighbouring churches. After climbing the long hill up to the town, rather in shadow, our vehicles made a turn round into the open space in front of the cathedral, and we came suddenly on this façade, with its naturally warm-tinted stone absolutely golden in the strong rays of the setting sun. As a piece of scenic effect, coming on one as a sudden surprise, it was magnificent. One forgot all about the questionable details in the glory of the picture as a whole.

Ely is the one front of the first importance which cannot be referred either to the French or the Italian type. It is a unique conception, resembling nothing else among our English cathedrals. It may be said to be the Italian screen type with a great tower interposed in the centre; the screen extends far beyond the main plan of the nave, and behind it, at each end, is a small chapel outside the line of the aisle walls. It will be remembered that the treatment of the crossing at Ely is supposed to have suggested to Wren the plan of the same portion of St. Paul's; but there is another point of similarity which has not been so much remarked upon, but which can hardly be accidental. The plan of the west front of St. Paul's, like this, extends beyond the line of the nave and has a small chapel behind each projection. In the middle of the thirteenth century the west front of Ely, as originally designed, might have been seen in its entirety. The line of the tower, just sufficiently projected to define it, was seen down to the ground, unscreeled by the Early English Galilee porch now erected in front of it, and which certainly does not improve the composition architecturally. There can be no doubt that, like the small building between the great piers at Peterborough, this porch, however a ritual use and name might be assigned to it afterwards, was originally placed there for purely practical reasons, in order to afford a better western abutment to the tower arches. The tower ended at the string below the present octagonal lantern and turrets, and was probably crowned by a lofty timber spire with spirelets at the angles;* the angle turrets, without the battlementing, by smaller octagonal spirelets of the same type. For a finish to the tower I think the present lantern, though weak in detail and so far out of keeping with the rest, is finer and more effective than the wooden spire, and the building has gained by the

alteration. It is a noticeable point that the usual three doorways, to nave and aisles, are not found at Ely, there being only one central doorway. This is in keeping with the general character of the design, in which the centre is strongly emphasised.

When this façade was complete in its original form it was one of the finest, best balanced, and most artistic architectural conceptions of its kind to be found in England or anywhere else; in spite of its originality and individual character, there is in it no straining after effect, no touch of eccentricity; it is a noble and dignified architectural design, marked by repose and breadth of effect. As you all know, the northern side of the screen fell down, there seems to be no precise record either when or why; unless there was something very wrong with the foundations, one is almost led to suppose that it was a piece of wanton destruction. One of the interesting questions which crop up in connexion with our subject, is, whether it would be worth while, and a right thing to do, to rebuild this destroyed portion after the model of the south side, and thus once more complete the design. I am decidedly of opinion that it would be. No one is more opposed than I am to that kind of restoration which consists in polishing up ancient work to make it look "as good as new," or to that which consists in conjecturally restoring some vanished feature from a few fragments, just because something of the kind is surmised to have been there before; as Scott absurdly did with the pyramidal termination of the south choir aisle at Chester, and Mr. Pearson did with the double cloister, as he called it, at Westminster Hall. Such restorations are neither architecture nor history. But it is a quite different matter when a repeating portion of a complete design has perished. It was perfectly justifiable to rebuild the fourth side of the cloister at Chester, which had been pulled down; it was simply making the design complete again by replacing a portion for which the other three sides afforded the model. And it is the same with Ely. The north side was identical in design with the south side; it has been destroyed; why not reinstate it, taking the south side as the guide? I have heard indeed one argument used against this class of restoration, to the effect that no one would think of restoring a missing limb to an antique statue; but the argument is absurd; and the two cases are not in the least analogous. No one can say what the position or modelling of a missing limb in a statue may have been; sculpture imitates Nature, which is capable of infinite varieties of movement. Architecture does not imitate Nature, and architectural design is in the majority of cases symmetrical—in the case here referred to we know that it was so; and the reproduction of such conventional features as turrets, mouldings, and arcades, to repeat a design still existing on the other side of the axis line, is a perfectly different problem from piecing a statue.

Peterborough is a front of exactly the opposite character to Ely. While the latter, as already observed, is specially marked by repose and a perfectly logical balancing of parts, Peterborough represents an inspiration of genius which disdains all ordinary considerations of logic—a passionate desire to do something great and astonishing and unprecedented, even at the cost of reasonableness and the proportion of things. The three great arches, regarded as a portico, are entirely out of scale with the whole building—out of scale, too, with the real requirements of a portico. All this we can easily say, and, for all that, I must agree with Fergusson's judgment that as a portico it is the grandest and finest in existence. It is true that all the rest of the building is an anticlimax, for only giants could have built anything that was not; but we may well be thankful for having one portico at least on a colossal scale, even if it was impossible to have the whole building to match; and it is curious that, great as is the contrast with Ely, it is to Ely indirectly that we owe it. It is the human weakness of emulation over again. Peterborough was to have had a flat front, with square towers projecting half beyond the line of the aisle walls. But while this was half finished arose the new and striking front of Ely. "Brethren, shall we be outdone, almost within sight of our own doors? Go to, let us build something that will take the conceit out of Ely." And truly they did it, only unhappily, they looked not warily to the foundations, wherefore their great conception

has been in imminent danger of falling over. It is a curious contrast that while Lincoln at first had a front of three great arched recesses, and then proceeded to embellish it by projecting a screen design each side of them, Peterborough ended with the three great arches as the culminating effort. One hears the question sometimes, Why is the middle bay narrower than the others? But that is the wrong way to put it. The question is, Why are the side bays wider than the middle one? Nor is there any mystery about it. The position of the centre piers was settled by that of the doors and piers in the first intended front; the increased width of the outer bays is simply for glory. They could not conveniently make the centre bay wider than they did, but at least they would spread out with a wider sweep in the side bays. The three gables, however, are made to range, and rightly. There would have been great want of unity if they had all been sprung in the same manner and with the same rake, and consequently with the centre apex lower than the side ones. The difficulty, however, is perhaps hardly got over in the best way by making the gable copings abut at different levels against the intervening turrets, preserving the same rake. It is rather a clumsy way of doing it. I think that if the springing had been the same and the rake different the effect would have been better; the difference in rake would have been less noticeable and the difference in width of the arches would have fully justified and explained it. The delicate little late porch, built between the piers to bind them together, is so completely out of scale with everything around that it always appears to me an eyesore; as a constructional expedient it is a very curious example of the way in which an engineering construction in the Middle Ages was presented under the guise of an architectural fantasy. Apart from this, the weak point in the front is the design of the flanking turrets, which look far too feeble to act as abutments to that immense arcade, and the decorative arcades formed on their surface make them look still weaker; they should have been treated as plain ponderous masses, with only some decorative diversification at the top. But the mediæval builders would have said, like Hamlet's friend, "Twere to consider too curiously, to consider so."

One can hardly mention Peterborough without reference to what may be called the great Peterborough restoration "row" a little while since. Having had the opportunity of going all over the front while the scaffolding was up, and examining the state of the vaulting at close quarters, I have no hesitation in saying that there never was a more unreasonable clamour than that which was got up in the Press to prevent the absolutely necessary repair to a structure which was in imminent danger of falling to pieces; and I feel satisfied that if the knot of architects, of peculiar opinions, who said that they could set it all right by tunnelling through the pack of the loose debris over the back of the vaulting and putting new backing behind the facing masonry, had been taken at their word and asked to undertake the work, they would have backed out; or if they had not, they would have dug their own graves, or those of their workmen. I should have gone further; I should have said, take down the whole front and rebuild it with the same facing stones on a concrete foundation, truly vertical and with a solid and well-bonded backing. It would have been, no doubt, a most complicated and costly job, but not an impossible one, and the unique grandeur of the front is such that it would be worth while to go to the expense in order to put it on a sure basis and preserve it perhaps for another five centuries to the world. As it is, after all the fuss, I believe the front is in a precarious state. From the upper scaffold the overhang of these immense masses appears most alarming, and it is rather problematical whether, in its present state, it will last out the century, unless something more is done. The erection of the scaffold gave one, however, the advantage of being able to go all over the front and see all the detail at close quarters. I do not think anything else gives one such a vivid idea of the extraordinary and bold character of mediæval work—of its difference from everything modern—as to go up among these shafts and niches and sculptures which have been beaten by the wind and rain of centuries, till they have almost lost the appearance of being man's handiwork and look like natural phenomena.

* See Mr. Beresford Pite's restoration of it in "Cathedrals of England and Wales."

mena, and to realise the boldness and depth of the mouldings and relief which seem so graceful and delicate from below, but which, viewed at close quarters, suggest the idea that "there were giants on the earth in those days."

This experience I have also had at Wells, which I had the good fortune to visit for the first time when the scaffolding for the late Mr. Ferrey's restoration was all over the front; a disappointment at the first glance, but which turned out a blessing in disguise, for I was lucky enough to elude the argus eyes of the clerk of works (for whom I had no credentials), and had time to climb all over the front and make a number of sketches of figures, caps, and mouldings at close quarters before my discovery by a conscientious foreman. Wells is more refined in detail than Peterborough, but even here the spread of the foliage carving on the caps, and the depth and intricate profile of the mouldings, take one's breath away. Wells is the sculptured front *par excellence*, and it is noticeable how completely architecturalised is most of the sculpture; the figures of kings and saints in their niches are so severe and square-cut in line that they hardly have human interest, but on that very account they are so effective architecturally; they seem not so much sculpture as architectural carving. One band of sculpture, however, here is in the spandrels of the arches just below the upper string course which runs right across the front, which is of a different type; the Resurrection series, which are as full of life as the sculptor could make them. They are all nude, which may be one reason why they were placed so high up (medieval feeling did not tolerate nudity even in art); but whether this was the reason or not, they are decoratively in the right place; being the only figures with movement in them, they fall naturally with the up-and-down lines of the window heads and the arcading, as the stiff statues below fall in naturally with the vertical lines of the niches. The Resurrection figures are so far weather-worn that it is difficult to judge how far they were originally well-modelled, but they are certainly full of spirit and expression, and I have always believed that they must have been done by Italian sculptors brought over; there is nothing at all like them in English work. The reality with which the sculptor has conceived his subject is remarkable: we see one man pushing aside a tombstone, and joyfully looking upward; another seated in a solemn attitude of resignation, as if waiting for his doom; a woman obviously much embarrassed at having to issue naked from her tomb; every figure has its own characteristic attitude and expression, here is a good set of drawings of these figures in some publication—I forget what; at no one can have realised fully their interest in those who has not stood by the actual figures, and tried to realise the thoughts and intention of the man or men who carved out in naive, yet thrilling, representation of sinful man called to judgment.

Architecturally, the Wells front is the French type extended, so that the two towers, instead of forming the termination to the aisles, extend completely out beyond them, and the whole partakes somewhat of the character of a screen before the actual building. The design possesses in a remarkable degree two of the most important qualities to be desired; a marked individuality of treatment, and a striking effect of contrast. It is consistent with itself throughout, and totally unlike any other temple in England. There is an almost assiduous severity of line throughout, and the principal divisions are more strongly marked than is usual in Gothic. The comparative plainness of the upper portion of the towers contrasts effectively with the richness of the lower portion; each story of the design is complete in itself and designed with a purpose; there is nothing accidental or careless. Were the towers intended to have pinnacles? I have never been on the top of them, and therefore cannot speak as to the actual evidence of the work; but it is quite possible the present finish was the ultimate one. It is unusual, but the whole design is unusual in so many points at this need not weigh much. I certainly prefer them as they are. The central feature of the roof line is not very well designed; and a deep cut between it and the towers is rather awkward, and seems to want something to fill in.

Rochester is a peculiar and not very beautiful front, but it is worth attention as again illustrating the extraordinary variety in con-

ception of these English fronts. Here again we have a design entirely different from any of the others—entirely distinct in itself. Instead of two western towers we have four turrets, and the side turrets do not form the termination of the aisles, but of the outer aisle walls; a kind of square head, on plan, at the end of the wall; the centre turrets performing the same function in reference to the nave arcades. Thus, instead of the front expressing the triple division of the section of the nave into three compartments, it emphasises the existence of the four parallel walls which divide the compartments. It is not such a fine, nor, I think, such a correct architectural treatment; but as a suggestion it is certainly interesting. It is not very easy now to conjecture how the central portion appeared as originally built. The present late battlemented finish cuts very awkwardly into the turrets, and goes far to spoil the effect. As originally built, it may have been an admirable whole, though on a rather small scale.

Salisbury as a whole is one of the most beautiful of all our cathedrals, especially in bright summer weather (it wants that to show it at its best); but the front is a vexation, and is to my mind the weakest and poorest of all. It has, to be sure, been restored to the bone, and looks terribly new and raw, but it must be presumed that the restoration fairly represents the original details, and it fails through complete want of purpose, concentration, and contrast; it is a medley of detail covering the whole face, with apparently no motive except to cover it and leave not a blank space for the eye to rest on. It illustrates, when seen from behind or at the side, the weak point of the Italian façade; a great part of the back of it forming a blank wall above the aisle roof.

The front of Ripon is a good example of the pleasing effect to be obtained by very simple and broad treatment of windows and wall, with hardly any ornament. It has one rather curious and perhaps illogical feature; it shows the three west doorways so common in cathedral fronts, and generally leading respectively into nave and aisles; but in this case all three open into the nave; the towers represent the end of the aisles, but are not pierced with doorways. The pinnacles and battlements do not of course belong to the original design; the towers were probably crowned, or intended to be crowned, by timber spires. The reticence and good taste of this front make it an instructive contrast to the fussiness of Salisbury.

Gloucester is a mere end, rather than a front, which replaced a Norman façade of which all external trace has disappeared. The flanking turrets of the centre are prettily treated, but otherwise there is not much to be said for it. Norwich, perhaps, shows some indication of what Gloucester may have been. There is plenty of the original Norman work left, but so hacked about that it has almost ceased to be a design. It seems probable that it was originally something like Rochester, with a turret at the end of each of the four walls; but the turrets are much less boldly developed than at Rochester.

Worcester is another "end" which has replaced a Norman front. It looks picturesque standing over the river, but it is totally devoid of greatness of effect, and looks like the end of a parish church. The Decorated window was substituted by Scott for a Perpendicular one, as a rebuke to the mediæval architects.

Winchester is another "end," but it ranks much higher than Worcester or Gloucester, as it shows a consistent, well-defined, and rather massive treatment. The weak effect of the raking lines of the aisles, it may be observed, is much less felt with the flat pitch of late Gothic than with the roofs of earlier date; it seems to support the centre better. The design illustrates also the value of tracery for giving continuity and coherence to wall and window-space. There was, of course, a Norman front before this, which stood about 40 ft. westward of the line of the present front, but as to the cause of this alteration I have never seen any explanation suggested.

The Exeter front, of the middle of the fourteenth century, with a screen added half a century later, depends for its effect mainly on the sculpture; the screen fits badly on to the earlier composition, and is too palpably an afterthought. The whole is picturesque owing to the richness of the details, but as an architectural design it is fragmentary, and looks more so in the side view than even in front.

Southwell is an interesting example of a plain and simple Romanesque front, with a certain

North German character about it, of course much interfered with by the large late west window inserted in it. The timber spires are modern; I should surmise that the original ones were rather loftier than these. The towers represent the end of the aisles. The later upper stage of the north tower has an arcade of intersecting round arches, producing pointed arches at the intersection; the arcade in the same position on the southern tower shows pointed arches. In view of the idea that has been sometimes maintained (but which I entirely repudiate) that the notion of the pointed arch arose from the intersection of round arches, this juxtaposition is a curious coincidence; but unless we had any proof that the northern tower was completed first, it of course counts for nothing.

Lichfield is one of the most beautiful, graceful, and complete of all our façades; and though exceedingly rich, the decoration is so judiciously disposed that it does not suggest a sense of overcrowding; in this it is an instructive contrast to Salisbury, where the decoration is disposed without method, and consequently looks crowded and confused. A particularly good point in the design is the manner in which the whole is bound together by the small arcading just above the ground story, carried right across the front. The towers represent the end of the aisles, but are extended slightly beyond them. The sculpture is not nearly so architecturally disposed as at Wells; instead of filling the niches and forming a part of the lines of the architecture, the greater part of it seems only stuck on the wall in the middle of the niche, with very inferior effect. It is true that a great deal of this is modern ecclesiastical mason's sculpture, and much of it very bad; but I presume that it approximately represents the proportions and position of the original sculpture; Scott, who restored it, would at all events have seen to that.

Canterbury is a completely French type of front, but deficient in marked character and in grandeur of design. The northern tower was rebuilt in 1834, and the other one is much restored and refaced, but still they represent the original design. The towers are exactly coincident with the aisles. On the whole, the front is the least interesting portion of Canterbury, but the towers have the merit of fine proportion and line, though somewhat tame architecture.

York is the most completely French in type of all our cathedral fronts, for which reason it is the favourite with American architectural critics, who think everything French is better than anything English. It will always impress every spectator from its great size (for English work) and its stately completeness; but I think nevertheless that it has been rather overpraised. It shows none of the genius of Peterborough and Wells; it is very correct but not strikingly original. It is however a design very well and thoughtfully carried out in all its details; everything is very well proportioned; the great depth of the buttresses, with their rich arcading, is very effective, and the manner in which the whole is bound together by the string-courses and the band of decoration carried right round at the point just below the gable, is very good. The only serious fault in it is in the treatment of the strongly emphasised and projecting corbel table below the balustrade, with the weathering of the buttresses finishing against the wall just underneath, producing an awkward in-and-out angle at this point; the pinnacles beginning over again and entirely disconnected from the buttresses, to which they ought in fact to form a finish. It would surely have been better if the buttresses had been carried partly through the corbel table and the pinnacles connected with them.

In observing that it is (in every respect but this) a design "thoughtfully" worked out, it is necessary to realise that these towers are of three different dates. The lower portion is early decorated; above that to the roofs, is late decorated; the upper stages are late fifteenth century. The difference of dates is obvious enough when we come to regard the details; but it is certainly remarkable what care the builders of the later portions seem to have taken to conform the general lines of the towers to one design; so that at a distance and apart from the details they might very well pass for towers built all at once by the same generation of men. This is an unusual circumstance in mediæval work, where in general the builders of one age did not care the least whether they spoiled or contradicted the design of their predecessors; and it looks

very much as if the towers had been carried out from a completely preconceived design which was expressed in a drawing, and had been conscientiously followed throughout. If not, the complete harmony of proportion of the whole is very remarkable and indeed almost inexplicable. The gable, it may be observed, correctly represents the rake of the roof, and the towers exactly represent the aisles, not even showing the slightest extension beyond the aisle walls; a very tame conception as far as plan is concerned at all events.

Westminster Abbey front has been so knocked about and restored and refaced that it has little real architectural interest now; and perhaps its chief value consists in the fact that the upper portion of the towers is the work of Wren, and that they form at once an example of Wren's unflinching sense of proportion in general design, and of his utter inability to understand the character of Gothic detail, or its value. Whether Wren intended to erect towers in the style of the rest of the building, and thought that he had done so; or whether he thought that he was substituting a superior kind of detail to that of the barbarous Gothic, and did this intentionally, we can only guess; but I think the latter is the true reading, and that he considered he was improving Westminster by an addition in a superior kind of architecture.

These towers serve, however, as a transition to our one classic English cathedral. The front of St. Paul's is essentially the French type, with the towers extended considerably beyond the line of the aisles (not the full width however), and with chapels in their rear somewhat resembling, as already observed, those in a similar position at Ely. The real life of this front lies in those beautifully designed towers, among the best things which Renaissance architecture has produced; or rather, we should perhaps say, the upper stages to the towers, for the tower character is nearly lost below through the continuance round them of the two stories of orders, destroying their vertical effect; but when a man has once sold himself as a slave to the Orders they will exercise this kind of tyranny over him. It is a pity that by putting a clock in the circular opening of the south tower their symmetrical expression has been destroyed; those two openings were not, I fancy, intended for clocks at all, but simply as sources of shadow and effect. At all events, if there is to be a clock in one, they might as well put something else, say a barometer, in the other; instead of leaving a dark socket on one side and a fish-like eye on the other. The middle portion of the front does not express the structure of the plan; for though the second couple of columns on each side of the ground-floor portico is coincident with the nave arcade, the point is not emphasised in any way, at least not in the colonnade itself—the tyranny of the Order again, perhaps; but still it would have been quite possible to have treated these and the end columns differently from the rest. The deep recess of the centre of the portico has a fine effect of shadow, and reminds one how much this element is wanting in the flat treatment of the rest of the exterior. I have seen bitter criticisms made on Wren for the sin of using coupled columns,—a criticism which seems absurd; the coupled columns have a very good effect, and as a matter of construction they really afford a better seat for the entablature than a single column does. It can hardly be said, however, that this would be a remarkable front were it not for the cupolas; and they can perhaps hardly be praised too highly.

There is one point in regard to which, I think, the comparative consideration of the west fronts we have been looking at is very important in its bearing on our view of mediæval architecture. I have several times referred, in going through them, to their remarkable diversity in conception and treatment, a diversity much greater than that to be found in an equal number of the most important French cathedrals. This fact, it seems to me, is quite at variance with the theory, supported especially by William Morris and critics of his school, that Gothic architecture in this country was entirely the work of what we should now call masons; artisans working spontaneously on the ground of a common tradition. True, this common tradition is shown in details, which for each period are all on the same pattern. But if there were no influence but this, surely our west fronts, not to mention other important features of the

buildings, would also all have been alike at the same period. But, as we see, they were as different as possible; even startlingly different. When Peterborough wished to eclipse Ely, whose new front had just been finished, they produced a front so utterly different in architectural idea and conception that, as far as the general idea is concerned, one would hardly think the two belonged to the same country. What are we to gather from this? Surely that these various designs were each the work of one independent man of genius, evolving his own architectural idea from his own inner consciousness. There are those who will tell you that there were no architects then; it is even asserted that it is the architects who prevent there being real architecture now. I take that to be nonsense. It is only the name that is new. There was no one called an architect in mediæval England, but there were persons whom we should call architects if they lived now, and they designed the fronts of Peterborough, and Ely, and Wells. Those productions were no mere mason's work.

And in what consists the grandeur of effect, the impression produced on our minds, by such works as these? It is strange, if we come to think of it, that we should feel the impression of power and sublimity from erections so relatively small—mere dots in comparison with the extent of surface of the globe. It is not mere material size that does it. A small hill is much larger than a large cathedral, but it does not impress us so much. Imagine three natural caverns the size of the three arches of Peterborough; would they produce on us any special impression of sublimity? What is it then? It is the shaping power of human intellect that gives the buildings their effect; it is the expression of human aspiration that appeals to our sympathies. The soul measures things by its own standard. As Browning says in "Sordello":—

"A sphere is but a sphere;
Small, Great, are merely terms we bandy here;
Since to the spirit's absoluteness all
Are like."

The mere material scale of the building is the human figure: the grandeur of the Peterborough portico is not in its absolute size, but in its size relative to the mere bodily scale. The body can enter through a very small door; it is the soul that demands the expression of its dignity, its aspirations, in the great arches of the portal. For all architecture is a symbolism.

THE STATE OF LONDON STREETS.*

THIS day twelvemonth a most valuable paper on "The Insanitary Condition of London Streets" was read here by Mr. W. Nisbet Blair, the Engineer at that date of the Parish, but now of the Metropolitan Borough, of St. Pancras. It may be that this change of name has something to do with the invitation given me to open this discussion, for our new municipalities are recognising their enlarged powers and their heavier responsibilities, or it may be that the subject, always before us and always growing, has sprung up again with the promise of spring.

I refer you to Mr. Blair's paper, with nearly every sentiment in which I agree, for a great deal of useful information, the result of his large experience. My own duty is to occupy a more limited field. Like many more, I have always been compelled to rely largely on my own unassisted senses of sight and smell, and for me bacteria and bacilli might grow in peace until they were visible to the naked eye. If I ask you to agree with me that our streets are dirty and ought to be cleansed, it is because I can see the dirt and know that the means of cleansing are well within our reach.

I will not say, as some have said, that London streets are the dirtiest of any to be found in the cities of Europe, but amongst the great Continental towns that I have seen, whether capitals or not, there is nothing similar to them. In all such towns the streets, however they may be paved, are kept clean, chiefly by manual labour and the use of water, which, in summer at least, is employed, not only for washing away the slush or to keep down the dust, but for the pleasure and comfort of the man and also the woman in the street.

Let us see of what the dirt of the street con-

sists. A good deal comes from the wear and tear of macadamised roads, less from granite and wood pavements, least from asphalt. In some roads, particularly when there are tram lines, and on smooth pavements, there is a considerable amount of sand that has been used to prevent slipperness. All these materials are harmless or of small account compared with the great bulk, which is simply horse droppings, worked up by wheels into slush in wet weather and ground into dust in dry. In some streets of small traders and where costermongers congregate, there is a very serious addition of animal and vegetable refuse which would not exist if the law were properly enforced, or which can be and ought to be swept up by special arrangements.

I am disposed to think, from what one sees, that the London dog is getting either more numerous or dirtier in habits. The Local Authority which is responsible for cleansing the footways should pay special attention to this form of nuisance.

The slush, even in our best thoroughfares, except in the city, usually covers the roadway so that it is impossible to cross it without gathering up a material portion to be carried home, and either left upon the step or deposited on mats and carpets. The clothes are fouled either by the act of walking or by splashes from vehicles; this dirt is brushed off inside the house in the form of dry dust. The dust in the street, composed practically as I have said, is allowed to blow about in clouds that obscure the view, that are bitterly annoying to passengers, and that get into the houses at every means of access, chiefly by the window when it is open to admit the fresh air! I do not know what a bacteriologist would say as to its effect upon our stores of fresh and cooked food, but investigations comparatively rude may suffice. When shelves of slate and wood in the fishmongers' and hutchers' shops were being replaced with marble, I thought that what was good for the food while in their custody would be good for it in mine. Accordingly, I had the larder fitted with white polished marble. The next thing I heard was that dirt was coming through the perforated zinc as it had never done before; it was plain enough to see on the marble, though not conspicuous on slate or wood, and we had to try and stop it with a fine gauze. I do not think many of us realise the amount of sweeping and dusting that falls to the lot of the female members of every London household compared with what they would find in the country, besides which country dirt is clean.

These domestic trials are nothing to people who have plenty of space and plenty of help. It is the poor who suffer from them most. A dirty street in a poor neighbourhood is an unbearable affliction to the households that exist in it; the street is the only playground a poor child can have. I have had to act professionally and officially on property so situated, and have noted the flights of stairs up and down which children are always running with the dirt of the street upon them. It is impossible for any woman to keep her rooms clean or her children tidy against such odds. I am convinced that a main cause of the dirty and ragged aspect of many in our streets is traceable to such surroundings. There are those in our population, not necessarily dishonest or ill-behaved, who contentedly go about the streets in the garb and uniform of the tramp. If the streets were clean these could not accumulate so much dirt, and would be ashamed to walk about or ride in public vehicles in such rags.

I will give a few examples of the treatment of the streets of Continental cities. If you say that London is far greater, so are the penny post and the London and North-Western Railway and universal providers far greater than the agencies of our humdrum ancestors. Economy resides with those who grasp details and deal with them in a wholesale manner. And they are often very ordinary-looking people.

In Paris the street dirt is to a great extent washed down into the sewers, but the streets are swept where necessary. I have gone to the lowest localities on the south side of the Seine, where at night it would be unsafe to enter some of the houses, and have seen a man carefully sweeping the street. In the northern suburbs, the abode of poverty and reputed anarchy, I asked a man why he was watering with the hose a street that looked perfectly clean. He replied that he was watering it to cool the air.

* A paper read by Mr. Thomas Blashill, F.R.I.E.A., at the sessional meeting of the Sanitary Institute, on the 13th inst.

In Vienna they wash the streets three times or at least twice per day according to their importance. Every shopkeeper must wash his footway twice per day, or he is fined.

In Berlin to be dirty is an offence. The scavengers are dressed in clean white slops and uniform caps with smart leggings on account of the water, not of the dirt. They are as clean and respectable as postmen or policemen. This speaks volumes. Compare the rough clothes and the dirty occupations of our own scavengers.

In Prague, punctually to the minute, I do not know how many times a day two men with hand-truck and hose come down the street and wash the surface, though it may appear to be clean. In that ancient city they go into every alley four times every day, pick up the garbage, and clean it with water and broom.

In the busiest parts of Brussels the housemaid comes out and washes the footway with a house flannel as she might wash a kitchen floor. The most sober description of the scenes in any old Dutch town on a Friday afternoon or a Saturday, when the whole female population turns out to wash the fronts of the houses as high as they can reach by throwing and squirting, sounds like caricature. This is going away from the street, but the clean street is a civilising influence; it provokes to cleanliness within the house and without, and in the outer man at least—to go no further.

There is a fine street in Budapest twice as wide as some of our noblest. On a brilliant day I saw a sight not to be seen in any of our towns. A young man in the dress of a warehouse clerk, but with uniform cap, carrying from point to point four feet of hose-pipe, was sending up into the air the most delicate spray, more like a thick haze, so as to just wet when it fell the whole surface for 100 ft. round. Pedestrians did not mind it, the sun made rainbows in it; he was not drenched, but might have just wiped his fingers and gone anywhere, or kept any company within the range of such as he seemed to be. In Budapest many working women go barefoot on the streets, looking singularly bright and clean. In a full tramcar I saw an English lady offer to share her narrow seat with one of these rather than see her stand. Politeness that speaks all languages is, nevertheless, discriminating. I am not sure that this would have happened in the City-road.

Thirty years ago the condition of the roadways in London both as to paving and cleansing was a matter of serious consideration. Wood had been tried unsuccessfully for the time; granite was practically the only material, but it was noisy and exceedingly dirty. The Poultry, with 17,000 vehicles per day, and all the busier streets had to be left untouched between morning and night. Then asphalt, which had been used in Paris for several years, was introduced. I visited professionally the principal mines on the Continent to report on the manufacture and use of the materials. When we got asphalted streets the dirt was more than ever conspicuous. Just then some genius suggested constant cleaning by boys whom he called "street orderlies." They took up the droppings before they were dispersed by the traffic and put them in large baskets. When these were full heaps were formed beside them; often the baskets were kicked over. I took some interest in the matter, and sketched the design from which was made the "street orderly bin" that is now used on nearly all our asphalt roadways for holding the droppings, and may be seen in the chief Continental cities; any one has always been free to make or to use it. In Glasgow they have hundreds of receptacles sunk in the pavement. Sometimes trucks or barrows are used, as in Holland, where the town streets are admirably kept.

I am convinced that for town thoroughfares this is the only satisfactory principle. If the droppings get ground into dust they blow about and befoul everything; then comes the water-cart and more sunshine, the road gets dry again, and the dust reappears. In wet weather the material soaks up the water so that a slush is formed many times the bulk and weight of the droppings, expensive to gather up and worthless when got. If the droppings are collected fresh they will form a valuable manure—they will not form dust; the principal use of the water-cart will be to cool the air, and the rain will flow away freely into the sewers. Some sweeping will be required, but the work will be lighter. The work of a

scavenger should no longer be considered of a low class or even "unskilled"; it should be well paid, and made to attract respectable able-bodied men.

The horse-broom, where needed, should be used with discretion and kept in good order. Very often this machine leaves the surface in about the condition which it ought to present when the work is begun. These brooms may do the heaviest work, but they do not finish so well as hand labour.

The removal of snow is a process capable of improvement, but I had rather leave it in the hands of those who are responsible for dealing with it. All these practical persons say we ought to return to the old system of cleansing the footways by private residents. Do the public authorities offer enough pay for a very unpleasant and trying kind of work? When that has been tried and has failed, the matter may be fit for reconsideration.

I will only offer one suggestion as to the material for roadways. "Macadam" has its merits and its faults, but it is never carried out as the inventor intended. Stones that will pass through a two-inch ring and that are covered with dirt or boggin do not form a macadam road. I never saw one of these rings in this country. An old road surveyor used to test the size by making the stone-breaker put the stone in his mouth, an unsatisfactory and probably illegal measure of capacity. On one of the splendid routes in France I once saw a man carefully putting every stone of a small heap through a ring that seemed to be about 1½ in.—that is macadam. I am reminded by a paragraph in the *Times* of a scheme that has often seemed to me feasible. At the City of Hamilton, in Ontario, they have, after long experiment, adopted a macadam of limestone saturated with boiling tar. I should think that if broken granite of the size I have mentioned were mixed dry with boiling pitch, as is done with large gravel, and laid on a firm bed, then sprinkled with fine chippings and lightly rolled, a good hard roadway would be obtained.

Having expressed, as I do, a strong and unhesitating opinion that the dirt in our streets, apart from odious comparisons, has increased, is increasing, and ought to be diminished, I must venture one or two suggestions upon questions of practicability and cost.

When next I go to an old village, where in my youth the pillion survived on which my grandmother rode to escape the jolting of a wheeled vehicle over the rough highway; where, in my own recollection, every woman walked to church in her pattens; I shall go over the same highway, whether wet or dry, whether by day or by night, without obliterating on my boots the condemnatory evidence that, some five hours previously, I had picked my way across an important London street. This reform has been the work of pottering surveyors of highways and aboriginal road-menders; and shall the engineers of our twenty-eight metropolitan boroughs be restrained from the pursuit of similar ends?

Upon the question of expense I will quote the hateful and hostile evidence of my half-yearly parish rate, which shows that while I pay 7d. in the £ for schooling, with whatever there may be to show for it, the total cost of paving, watering, and cleansing is only 5d. And I ask whether we should really be brought to ruin by lavishing an additional 1d., or even a much begrudged 2d., on making usable and tolerable—and, at any rate, visible—the pavement that is supposed to be of gold.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of the Sheffield Society of Architects and Surveyors was held in the School of Art, Arundel-street, on the 14th inst. The President, Mr. Joseph Smith, was in the chair. The winners of prizes in the competition promoted by the Society for measured drawings of old buildings in the neighbourhood of Sheffield were announced. Mr. H. W. Inott won the Society's prize of three guineas and the President's prize of five guineas; Mr. J. Miller the second prize of two guineas; and Mr. E. R. Bower's drawing was highly commended. The drawings will be displayed in the Montgomery Hall at an early date. It was unanimously decided to forward the following address to his Majesty in the

name of the Society:—"We, the President and members of the Sheffield Society of Architects and Surveyors, dutifully approach your Majesty to express our heartfelt sorrow at the lamented death of her Most Gracious Majesty Queen Victoria, whose pure life and noble character throughout the longest reign in English history have rightly endeared her name and enshrined her memory for evermore in the hearts of the millions of her subjects. We gladly testify here to her enlightened patronage during that long reign of the arts and sciences, notably to that of the ancient art of architecture, for which she has justly earned our lasting gratitude. We humbly tender our fullest assurance of loyalty and devotion to your Majesty, whom may God safeguard and guide long to reign over us."—Mr. H. H. Statham afterwards gave a lecture on "Our Cathedral Fronts: a Comparative Criticism," which is printed on another page. A vote of thanks was accorded to the lecturer, on the motion of Mr. Gibbs, seconded by Mr. Withers, and supported by Mr. Wigfull, Mr. H. L. Paterson, Mr. T. H. Waterhouse, Mr. Fenton, and the President.

BRISTOL SOCIETY OF ARCHITECTS.—The ordinary monthly meeting was held at the Fine Arts Academy on the 11th inst., Mr. F. W. Wills in the chair. Before the business of the meeting the President alluded in feeling terms to the death of Queen Victoria, who, as patron of the Royal Institute of Architects and the donor of an annual gold medal for the promotion of architecture, was directly connected with the profession. Quite apart from this personal side, the President dwelt upon the great loss the nation had sustained, and which has been so universally felt and acknowledged. After the routine business a paper was read on "Church Restoration" by Mr. C. H. Samson, F.R.I.B.A., of Taunton. The paper, which was the outcome of many years' experience as a diocesan surveyor, dealt very fully with the practical work of church restoration as applied to the fine old village churches to be found in West Somerset. The lecturer strongly advocated the preservation of all old work, and insisted that any necessary new work should be simple in character and of the very best materials. A collection of drawings of churches was exhibited. Upon the motion of Mr. Joseph Wood, seconded by Mr. Cyril Thompson, a hearty vote of thanks was accorded Mr. Samson.

EDINBURGH ARCHITECTURAL ASSOCIATION.—This Association visited, on the 12th inst., the City Observatory, Calton Hill. The party numbered between twenty and thirty, and they were conducted over the buildings by Mr. William Peck and his assistant, Mr. Ritchie. At the outset, Mr. Peck gave a short history of the Observatory buildings, the original design of which was by Playfair. The various transit and other instruments for determining time, instruments for measuring angular distances, equatorial instruments, and reflecting and refracting telescopes were described and their uses explained to the party, special attention being directed to the constitution and working of the domes.

DUNDEE INSTITUTE OF ARCHITECTURE.—A meeting of the student section of the Dundee Institute of Architecture was held on the 9th inst. in the Technical Institute, Mr. P. H. Thoms, President, in the chair, when a lecture was delivered by Mr. J. Donald Mills, architect, on "Some Staffordshire Buildings." Mr. Mills commenced by describing some characteristics of the natural features of the county. Part of the county contains some exceedingly picturesque scenery, and is altogether outside of the "Black Country." After a short résumé of the history and archaeology of the county, Mr. Mills proceeded to show a selection of lantern slides, drawings, and sketches illustrating some of the beautiful and interesting old stone manor houses, village churches, and other buildings, including the following examples, which were described:—Lichfield Cathedral, Ashbourne Church, Wootton House, and Moreton Old Hall. He also crossed the border into Derbyshire, so as to include Haddon Hall. Reference was also made to some modern buildings of note, such as All Saints' Church, Leek, the work of Mr. Norman Shaw, R.A., and the Monastery of St. Bernard, by Pugin.

THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—A general meeting of the members of the Royal Institute of the Architects of Ireland was held recently at the Institute rooms, 20, Lincoln-place. In the absence of the President, the chair was taken by Mr

J. Rawson Carroll, F.R.I.B.A. The following resolution was adopted by the meeting:—"We, the members of the Royal Institute of the Architects of Ireland, in general meeting assembled, desire to express our profound sorrow at the death of our revered and honoured Sovereign and Patroness her Majesty Queen Victoria, and to convey with loyal and dutiful respect to his Majesty King Edward VII., the Queen Consort, and the other members of the Royal Family, our deepest sympathy in their great bereavement." The President and hon. secretary were requested to take the necessary steps to have the foregoing resolution brought under the notice of the King.

Illustrations.

STUDY OF AN INDIAN HOUSE.

THIS is a reproduction in monochrome of one of the coloured drawings which gained for their author, Mr. Hervey Rutherford, the Owen Jones Studentship of this year.

It shows part of the façades of two dwelling-houses built of teak wood, carved and painted. They are seventeenth-century work from Ahmedabad, Guzerat.

FIREPLACE, HOTEL-DE-VILLE, AUDEGARDE.

This illustration is from the numerous collection of sketches which gained for their author, Mr. H. W. Cotman, the Institute's Pugin Studentship this year.

In regard to the subject itself, Mr. Cotman writes:—

"This late Gothic fireplace was executed by Paul van Schelden during the regency of Margaret of Austria, and it is interesting to compare it with his well-known doorway screen which forms the entrance to the Council Chamber, in which this chimney-piece is.

Its date is 1529, two years earlier than that of the Renaissance portal. It will be noticed that the Austrian eagle of the Empire forms the device of the centre shield in the lower part, with the collar of the Golden Fleece and the Imperial crown. The eagle occurs again in the left-hand panel of the upper part. The shields to the left and right bear the lions rampant of the Court of Flanders and Dukes of Burgundy. The blazoning of these shields is kept bright by fresh paint.

The figures under the canopies to the left and right probably represent Justice and Truth, with Our Lady under the centre one, bearing in her arms the Church of Notre Dame de Pamele of this town with its octagonal centre tower.

The hexagonal canopies are similar in design to those on the exterior. The chimney-piece, which is similar to the one below in the Salle des Pas Perdus, is in excellent preservation. The fireback and dogs are somewhat later in date, as the inscription shows."

DESIGN FOR ENTRANCE GATEWAY TO A PUBLIC PARK.

This design, by Mr. Walter Fairbairn, of Edinburgh, is the one to which the Council of the Institute this year awarded the Tite Prize, instituted for the encouragement of the study of Italian Renaissance architecture.

We have already expressed our opinion on this and most of the other designs submitted, in an article on the Students' designs in our issue of January 10.

The author writes:—"In preparing my design I was undecided at first whether to have one large gateway or a double system with a separate entrance and exit. I decided on the former as being more suitable for a large and imposing treatment (although more difficult to keep in scale), and also fulfilling the traditional idea of a gateway better than the latter."

ROYAL MASONIC INSTITUTION, WOOD GREEN.—We read that the Governors of the Royal Masonic Institution for Boys are about to vacate their premises at Wood Green which have been acquired for purposes of the Home and Colonial Training College, in Gray's Inn-road. New schools for the Royal Masonic Institution are being erected at Bushey, Hertfordshire

THE ARCHITECTURAL ASSOCIATION : THE BASIS OF GOTHIC ARCHITECTURE.

An ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., the President, Mr. W. H. Seth Smith, occupying the chair.

The minutes of the last meeting having been read and confirmed, and Mr. M. N. Castello having been elected a member,

The Chairman announced that a special general meeting would be held on Friday, 8th prox., when the Committee's scheme for the establishment of day classes in connexion with the Association would be submitted to the members. The scheme had been drawn up by a strong education committee, and had been adopted by the general committee with a few amendments; but in accordance with the by-laws it is necessary to bring it before the general body of members before it can finally pass.

The Chairman then called upon Mr. E. S. Prior to read a paper on "The Basis of Gothic Architecture," of which the following is an abstract:—

Mr. Prior said that so recently as last November they had heard such an able paper by Mr. F. C. Bond on English and French cathedrals,* accompanied by many illustrations of the beauties of Gothic art, that he felt he ought almost to apologise for again bringing the subject before them; but there was this advantage in following Mr. Bond: that he could ask them to recall the beautiful lantern illustrations they had seen on that occasion. No doubt an inquiry into the basis of this beauty would incline to that psychological side of art which many people considered a region of barren speculation, where one wandered in the quest of conjecture. For was there such a thing as beauty in Gothic art, or in anything else? Tolstoi, in his recent work on art, said that beauty in art was a phantasm, but he (the speaker) would beg that question. What if beauty had for ever hid her face? Still the love of beauty must be admitted, and it existed as a force to be counted on, for from this love of beauty came the emotions which expressed themselves in creative work. Was it not human nature that we counted that beautiful which we loved?

That was as far as he intended to go into the region of speculation, and he would ask them to swallow no more metaphysics, but turn to the practical question: Who really were the creators of Gothic beauty—whose love of beauty made the beauty of Gothic art? It would be conceded, he trusted, that the Gothic creation was one of a very marked kind, having a distinct geographical range which was sufficiently remarkable apart from the art and science of it all. To the separateness of the Gothic style (which was equally astonishing) we should be more alive were we not saturated with the modern revivals of it. The life of the Middle Ages was all coloured and transfigured by the glory of a distinct Gothic creation; the mediæval city was distinct of its kind among the cities of all ages—not only by its laws and government, its customs and morals, but still more by its saturation with an active art that affected everything. It was the exact reverse of the hole-and-corner successes of individual art faculties. In mediæval life every art and every craft was to be seen under a dominant emotion, and it was this aspect of a specific energy making everything beautiful—in a word, the passion of it all—that was, to his mind, the most significant fact of Gothic art. Anyway, that art had aroused almost endless discussions and given rise to many theories, some of which he proposed to discuss in order to see how far they accounted for the wonder of this Gothic style; and he would divide them according as they alleged causes affecting the whole body of the community, or as they indicated individuals as being the creators of art.

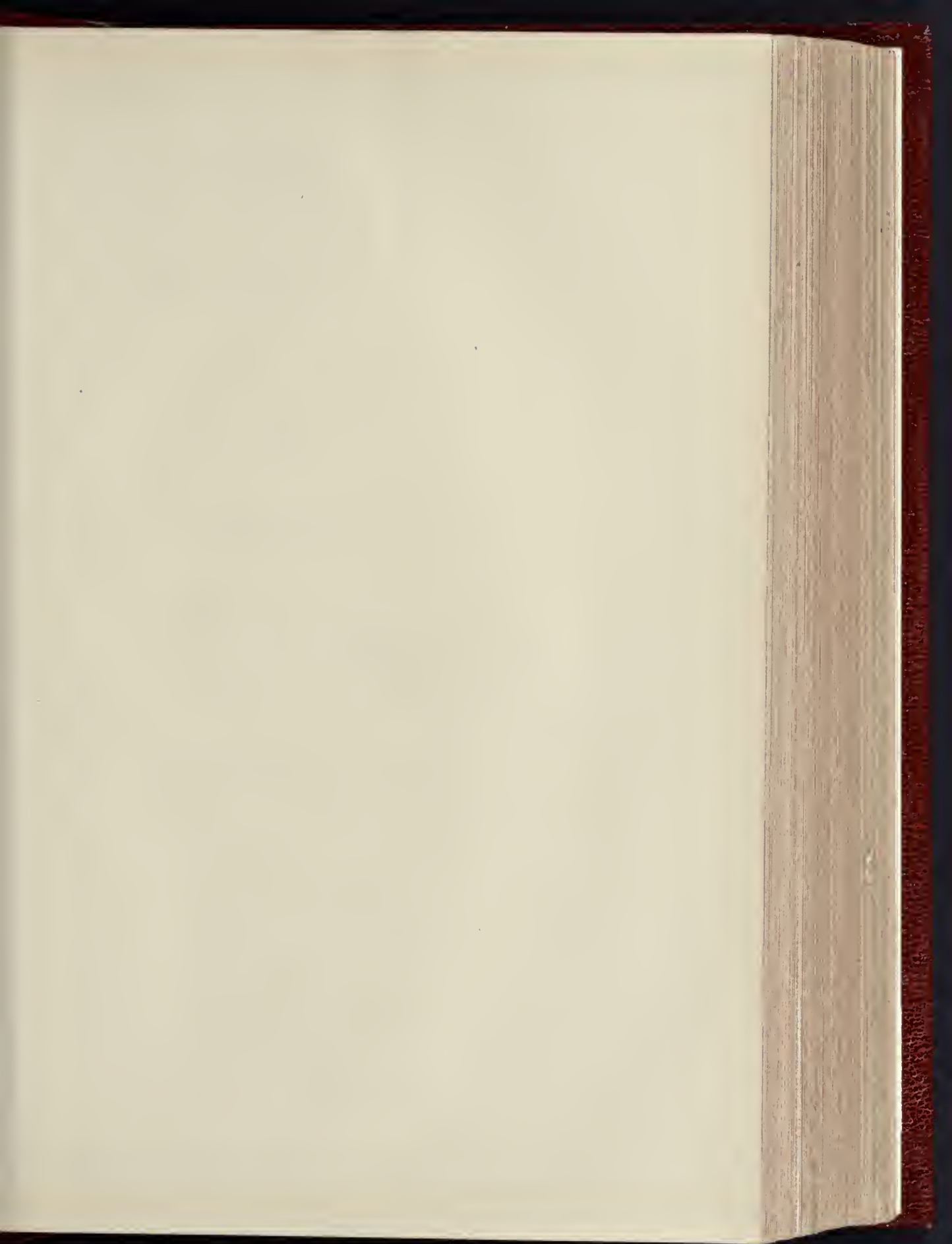
For example, the religious theory might assert generally that art was the handmaid of religion; or, on the other hand, that the exaltation of religious sentiment in the artist made him a gifted designer. These two sides were capable of being separately weighed, and we were entitled to ask, when the beauty of any work was laid at the door of faith, whether the general condition of the com-

munity or the personal faith of the artist was brought into court. He proposed to deal in some degree with the personality of the mediæval artist, and would endeavour to show that this personality constantly eludes us, so that it must have counted for little and could practically be disregarded. Even to-day, with our practice of individual art production, it was difficult to maintain that men of noble mind, or of religious faith, or of any particular training, by reason of such endowments, achieved great art; and in mediæval records there was no evidence to suggest that noble aspirations led to anything like our modern individualism.

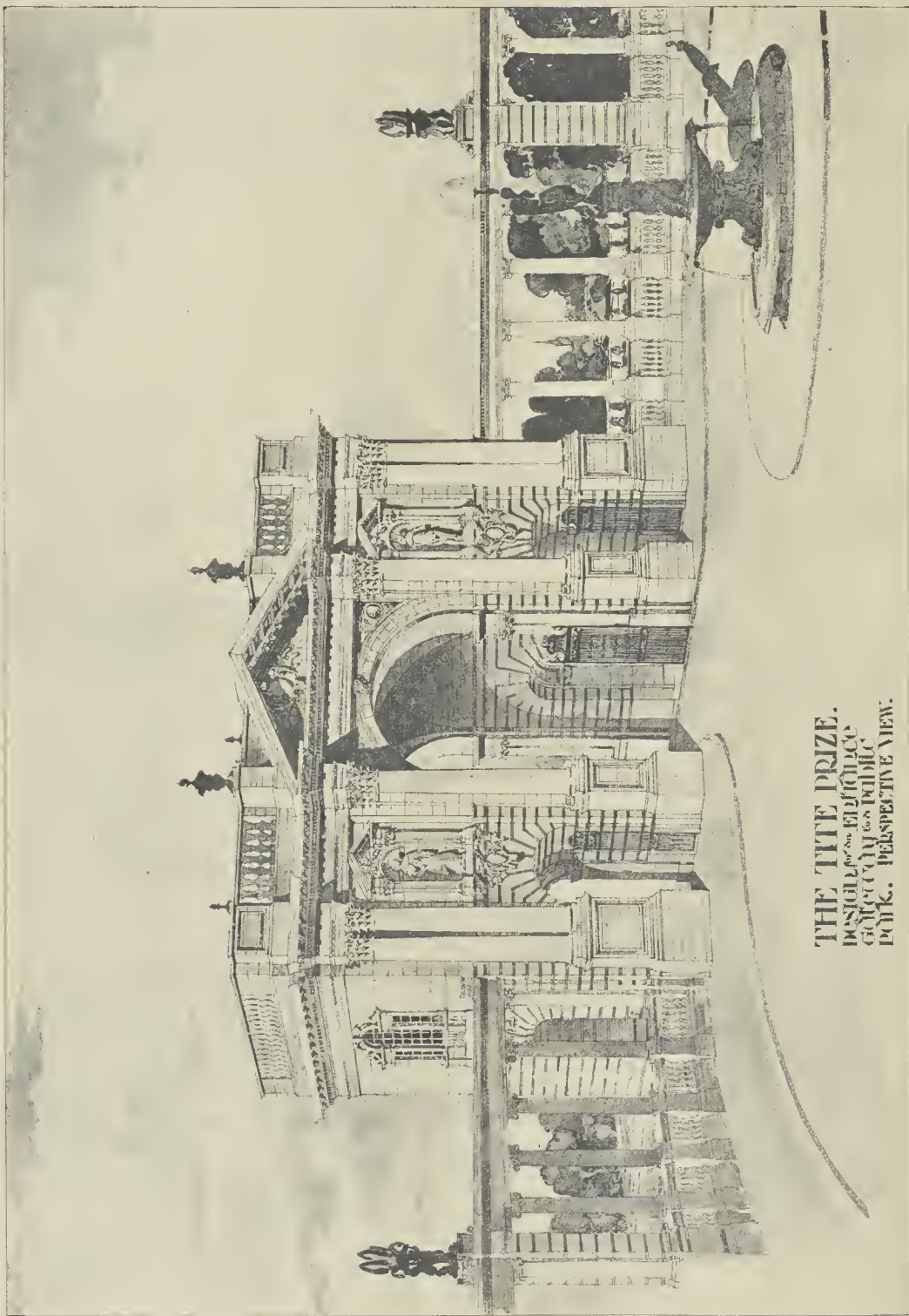
Mr. Prior then proceeded to discuss the three following theories of the origin of Gothic art, viz., the Ecclesiastic, the Freemason, and the Architect, though he said he did not suggest that such classifications were exhaustive. That which he nicknamed the Ecclesiastic theory would derive the growth of mediæval art from the personal faith and character of the religious orders—the monks, canons, and friars who were in the heyday of their influence and importance. Was it possible to associate in a personal way the members of a religious order with the designing of Gothic art? Most certainly that art arose in the building and decoration of houses and churches for monks, canons, and friars, and the history of Gothic art was mostly written in abbeys and cathedrals. The supposition of the Ecclesiastic theory was that in these ecclesiastics we had the personal creators of the Gothic style—this idea during the last fifty years appearing in the views of many writers, including at one time Street, who thought it "sacrilegious" to question it—for we had only to revive a similar state of society as existed in the Middle Ages to achieve a like distinction for our architecture to-day. This, of course, was the special pleading of a religious revival, and outside such propaganda, what was there in the records to connect great ecclesiastics with building? It could not, with any show of probability, be contended that fierce soldiers and busy politicians, like Bishops Roger, of Salisbury, and Pusey, of Durham, could have been the personal designers of the great churches. Everything tended to prove that the bishops hired their builders and masons to carry out their building work: there was no evidence to show that what we call the design of a building lay with the authority that ordered it. He believed that no English document remained to tell us that ecclesiastical authority set out the ground plan even of its churches. It was probable that it did so by word of mouth, and perhaps in draught, though there was nothing to indicate this last. There was no doubt that the cleric dictated the general ideas of what the building was to be, but that was not what we mean by personal design nowadays. In the origin of the great Gothic buildings the ground plan was very much prescribed by tradition, and what followed was the work of accomplished masons, well exercised in their craft. That was radically different from the system of individual designing. The religious control so far was only the dictation of what was to be built, although it entitled certain bishops to be called the builders of their churches. Mr. Wyatt Papworth had so thoroughly sifted all the mediæval material at hand as to the appointment of ecclesiastics for the management of building, that it was only necessary to read his paper in the 1887 "Transactions" of the Royal Institute of British Architects to feel sure that no designing function as an artist could be indicated in posts which were held by poets like Chaucer as well as by bishops like the Bishop of Salisbury. Still there were certain references to the personal intervention of ecclesiastics in regard to building which should not be passed over, and they were found in our earliest records. It is significant that the earliest missionaries to our ancestors in the seventh century introduced workmen into this country to build in stone in the Roman manner. There were indications that St. Augustine brought such workmen from the Continent; and Wilfrid of York, sixty years later, may have got them to build at Hexham and Ripon. Thereafter the reputed saintliness of building craft remained for some five hundred years in mediæval tradition, as can be shown by many entries in the records.

In the foundations of mediæval society, faith and civilisation were walking hand in hand. But in the making of Gothic the personal sentiment of religious life was not discoverable and no more could the personal skillfulness of

* See our issue for November 3 last.

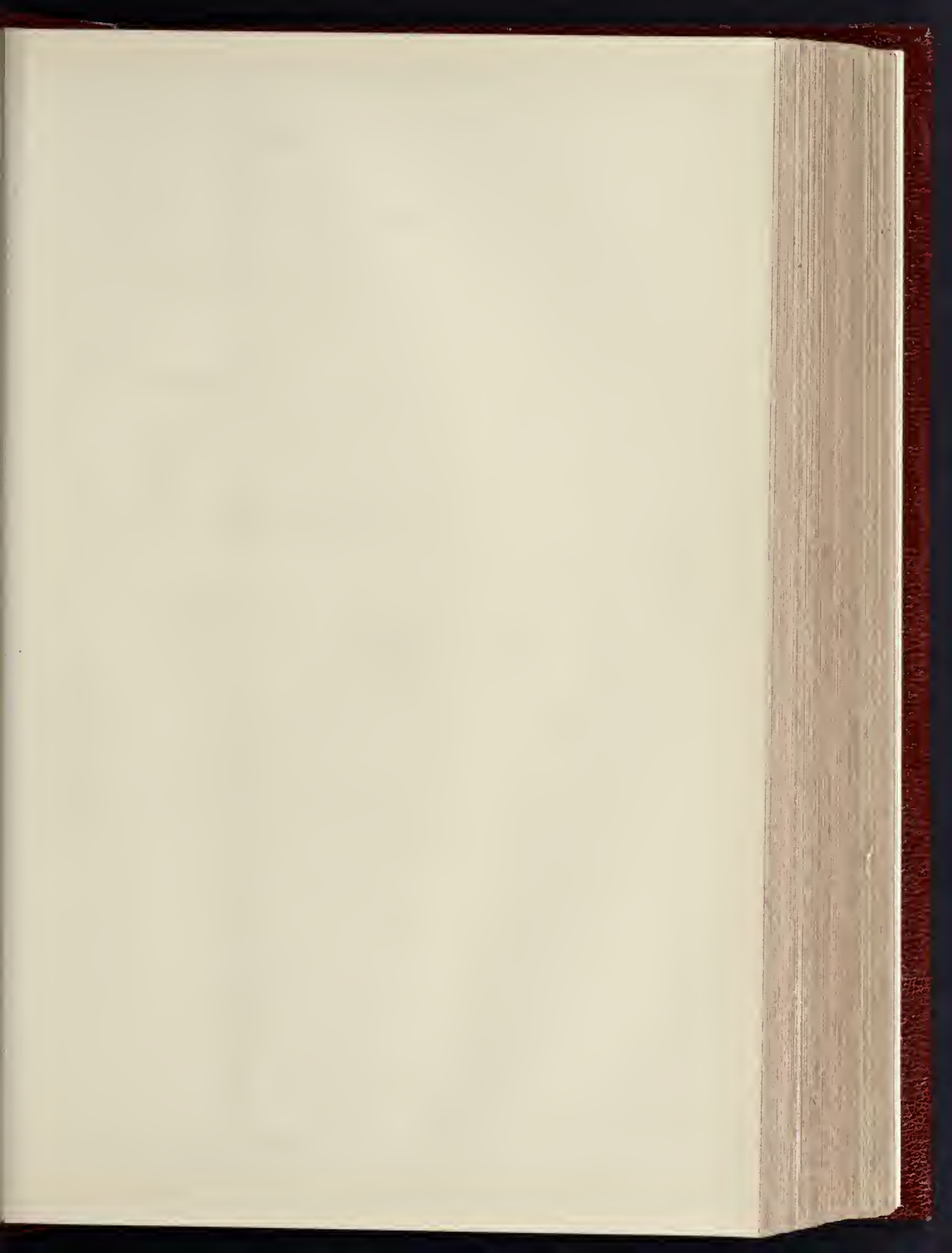


THE BUILDER, FEBRUARY 23, 1901



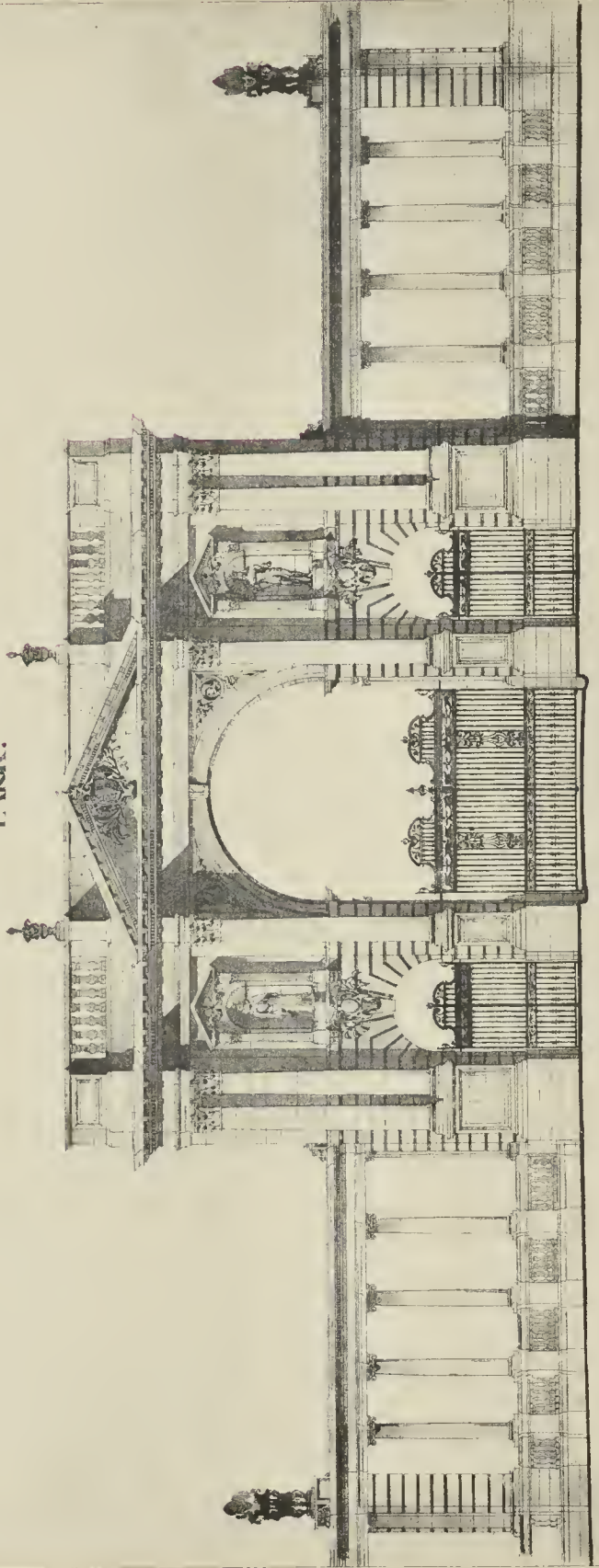
THE TITE PRIZE.
DESIGNED BY MR. WALTER FAIRBAIRN
FOR THE CITY OF LONDON
PUBLIC PARK. PERSPECTIVE VIEW.

DESIGN FOR ENTRANCE GATEWAY TO A PUBLIC PARK.—BY MR. WALTER FAIRBAIRN
INK-PHOTO, SPRAGUE & CO., LTD., 4 & 5, EAST HARDING STREET, LONDON, E.C.4.



THE BUILDER, FEBRUARY 23, 1901

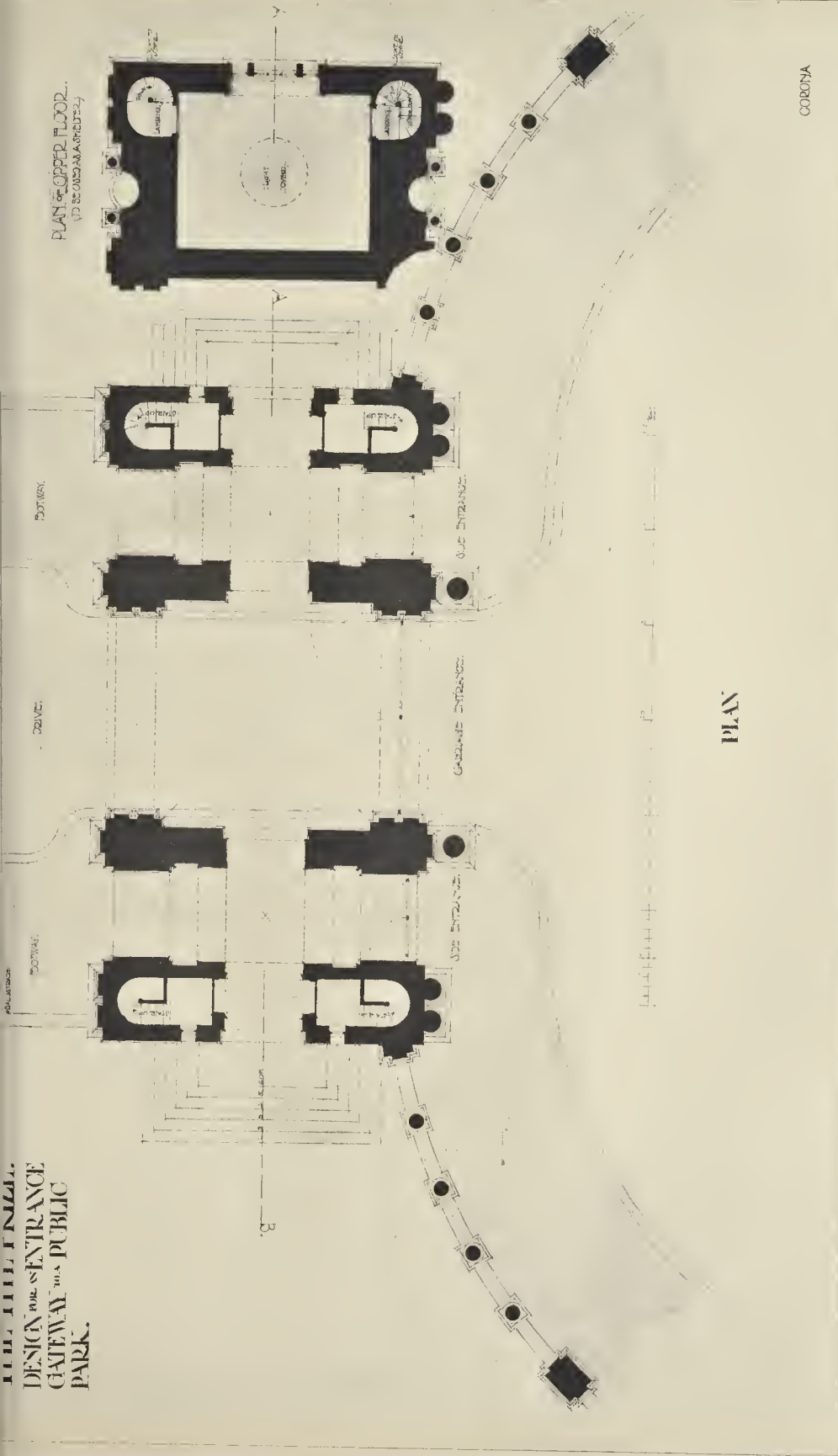
THE TITHE PRIZE.
DESIGN FOR AN ENTRANCE GATEWAY TO A PUBLIC
PARK.



FRONT ELEVATION.

**THE ILLINOIS
DESIGN FOR ENTRANCE
GATEWAY TO A PUBLIC
PARK.**

PLAN OF UPPER FLOOR.
VD 82-2020 AA ARCHITECTS



PLAN

CORONA

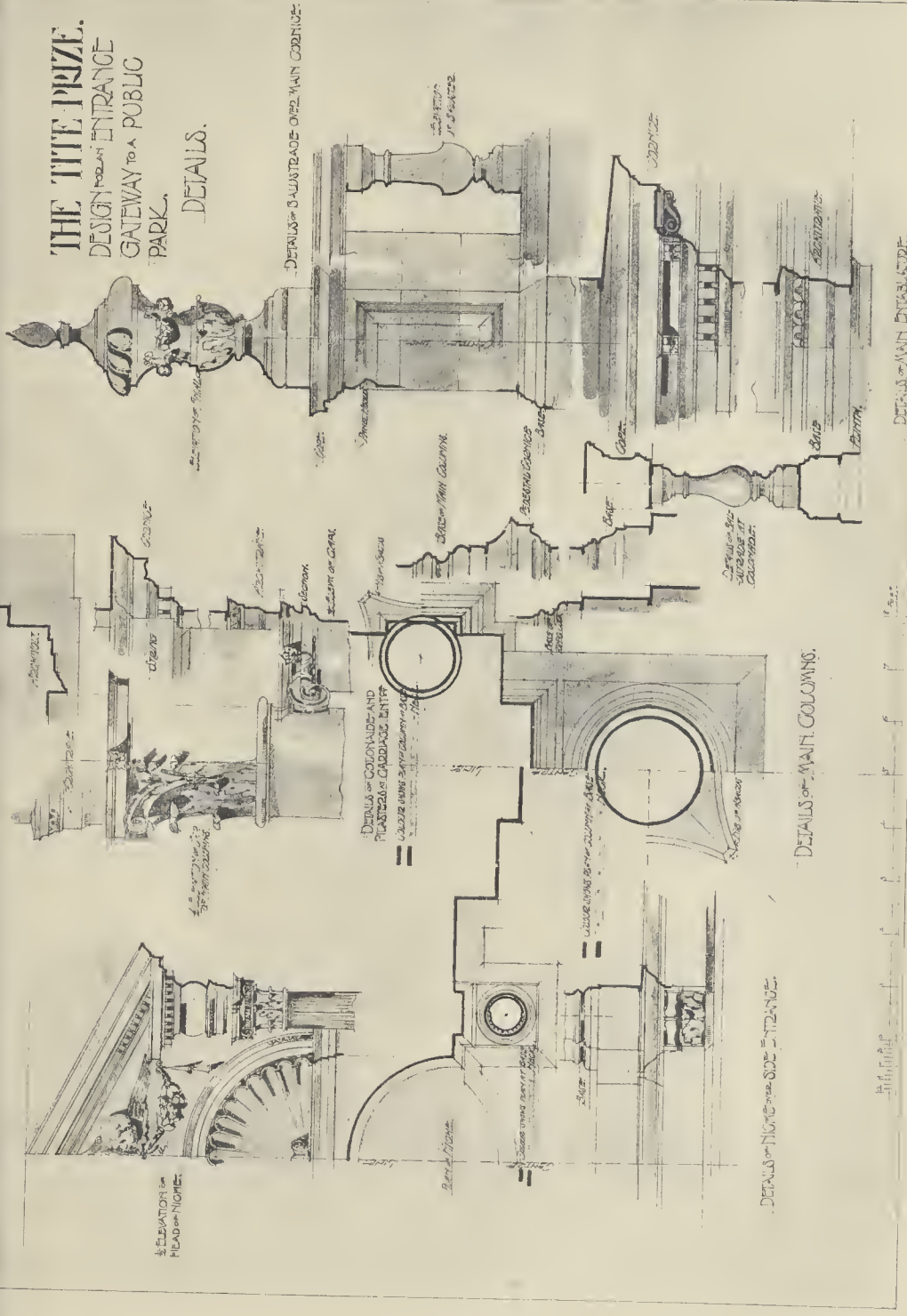
DESIGN FOR ENTRANCE GATEWAY TO A PUBLIC PARK - BY MR. WALTER FAIRBANK.
FRONT ELEVATION AND PLAN.

INK PHOTO GRAPE AC'LY 4 5 EAST HARDING STREET, PETER LANE CO.

Title Prize Design, R.I.B.A., 1901.

THE TITIE PRIZE. DESIGN FOR AN ENTRANCE GATEWAY TO A PUBLIC PARK.

DETAILS.



INK PHOTO SPHAGNE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR ENTRANCE GATEWAY TO A PUBLIC PARK — BY MR. WALTER FAIRBAIN.

DETAILS.

Titie Prize Design. R.I.B.A., 1901.

the masonic guild be found therein. This latter theory had been revived by an Italian writer, Merzario, whose researches have been introduced to us in a recent work by "Leader Scott." It was, however, Thomas Hope who, in 1835, had started the idea, and in 1852 Macaulay told Mrs. Beecher Stowe that all the cathedrals of Europe arose nearly simultaneously, and were built by a body of freemasons.

Mr. Prier, having referred in some detail to "Leader Scott's" book, "Cathedral Builders," said that if any one should be charmed by the symbolist interpretation of ancient documents and inscriptions by which that work made out the Comacine Guild, he would ask them to read chapter xxi. of Thomas Hope's Historical Essay, and then turn to the actual records in order to test the accuracy of this theory of the universal domination of the guild. For example, Geware's account of the rebuilding of Canterbury choir indicated no dominant authority of freemasons, but only that the monks appointed and organised the workmen. They were hired and dismissed, as the case required. As Street, from his examination of the Spanish archives, declared against the freemason theory, so Wyatt Papworth says that the earliest records of the local guilds of masons showed that they were not under any central masonic organisation. There was little proof either for Merzario's theory that Italian masons had a guild with a dominant authority during the thirteenth and fourteenth centuries. Was there, then, no brotherhood of masonry, no mystery of craft? The craft of masons had, of course, its methods and secrets; and there was this interesting point with regard to mediæval masons, viz., that it was by reason of their stone carving that they established themselves as the chief experts of Gothic building. Stone constituted the bone and flesh of Gothic building. Christianity introduced the ambition for chiselled stone, and it was the stone-dressing workman who came to be the ruler over the other workmen, and the knowledge of setting out necessary for his craft made him the acknowledged expert for the setting out of the building. So the master mason's craft marked him out as the ruler of Gothic architecture. His idea of proportion, though based on the easiest manipulation of compass and square, had a sacredness on which he could establish the mystery of freemasonry. But such could hardly be reckoned as the essence of Gothic work, and this little geometrical knowledge was not what we mean by personal quality in the work of individual architects.

With the Renaissance in Italy appeared the scholar architect, but the Architect theory would undate this event some five or six hundred years, and would make the beauty of Gothic buildings depend on the architect in the sense that it does to-day. No doubt the word might be used generally for any human agent of architecture; but what was meant now by the title was a specialist architect who designed buildings and had them carried out by builders. It could be said of the Middle Ages, that we do not know where the architect ended and the builder began. To-day the functions of architect and builder were separated by definitions which allowed of no confusion. Both terms in this sense were of comparatively modern origin; the term "builder" came into use early in the nineteenth century, and that of "architect" in England in the last part of Elizabeth's reign, and it was clear that any transference to ages long antecedent of the terms which these terms had been specialised to convey must create confusion. It was obvious, and yet it was forgotten—of only by the vulgar and unlearned, but by scholars, and the idea of the personal individual architect governed most views on Gothic architecture. Even with Street, in his "Architecture in Spain," all through his sympathetic description of mediæval cathedrals, it could be seen how he thought that the architecture he is describing came into existence as the result of personal genius like his own, and he recorded the excellences and peculiarities of the arches he described as essentially the result of design, and not of growth, and as if a set of wings signed by an architect was responsible for them. It was wonderful that Street could speak of the mediæval *magistri* as though they were architects like himself, when his own complete analysis of the documents shows how complete was the difference.

If, then, there was no class of "designers" in mediæval times, was there no drawing of a building? He had already referred to plan-making which existed in the great

creative period of Gothic art, and if any one called that plan-drawing "designing," he was welcome to that opinion. In England we did not find our mediæval buildings copied one from another in the large matters of design, though in the Ile de France, as Mr. Bond had shown, the church buildings were copied a great deal. Now the point of his inquiry had been as to whether the capacity of the personally-designing architect could be accepted as lying at the root of Gothic excellences. Such transcripts of existing work by master masons went straight for his point, since they were carried from place to place for the purposes of reproduction, and the decadence of such copied work is, as Mr. Bond pointed out, very evident. There was clearly no room for the architect as we know him—the trained imaginer who planned the shape, construction, and detail, so that the workmen following him could carry it out. Plan, construction, and beauty in mediæval building were not matters of any one's fancy to be put this way or that as the modern architect wished. Such things were not at the mercy of the designer-architect; the plan was set by an authority which brooked no deviations. The construction of buildings in each period of the Gothic style was carried on by practical masons, who were not turned aside by considerations of design.

The personality of the one-architect theory must therefore be dismissed, and the broad basis of Gothic architecture must be considered to be due to environment and habit. It was because it was due to cosmic forces that Gothic art seemed to be so transcendent. But Gothic art did not stand alone in that position. Separated by centuries, there were, besides the Gothic, other eras in which man had shown himself an inspired creator; and looking at the matter in this way we could see the ebb and flow of cosmic art—the creation of distinct styles, such as Egyptian, Byzantine, Greek, Gothic, &c. He knew, of course, that the coming and going of art was by many correlated with the phases of religious faith. It was held that at the times of great art there was great life, when the whole vigour of man's nature spoke with a full voice. But he could not see as far as that; the phases of great creative expressions of art seemed independent of great religious fervour or great nobility of life. Great art and great life had on occasion coincided, as had bad art and bad life, but such coincidences were marred by others of very doubtful interpretation.

He had shown that the distinction of producing Gothic art could not be assigned to the personality of one particular class—ecclesiastic, freemason, or architect. Still, it was clear that building work could not continue as the common habit of the community, and it became delegated to a class of craftsmen, and there arose a building class, although for some time after the monks continued to do their own building. The expression "architect" once meant the whole community; then the whole body of craftsmen; and now it was parsimoniously applied to the single designer who had monopolised the name. Gothic art was great because it was not individual but cosmic.

The Chairman, in inviting discussion, said they had had a great intellectual, archaeological, and artistic treat. Mr. Prier's work was full of freshness, and raised points in their minds which were of great interest and importance to them as a profession. Mr. Prier's views were startling sometimes, but they were always worthy of the very closest investigation.

Mr. G. B. Carvill, in proposing a vote of thanks to Mr. Prier for his eloquent address, said he could not altogether agree with the theory of not having an individual architect. It seemed to him incredible that Lincoln Cathedral, for instance, should be produced from a ground plan by a body of craftsmen, and he thought that a drawing of some description must have been used. He could not see how a craftsman could set out a piece of masonry unless he had had something to go upon, and he thought that the *magistri* who had been referred to must have been something of an architectural ghost, and knew a little more about what was going to be put up than what we were given to understand.

Mr. G. H. Fellowes Prynne, in seconding the vote of thanks, said that anyone who had heard the lecture that evening and who had read Mr. Prier's book would recognise the same warm enthusiasm for the subject he had in

hand which made both his reading and writings so interesting to those who heard and read them. It was impossible to speak on such a paper with any positiveness and in any detail without having considered the paper previously, but, in a superficial way, he might say that the theories they had put before them must give them rather a shock. Of course, the discussion as to the existence of these craftsmen and freemasons had been going on for some time. Undoubtedly guilds of craftsmen did exist, but he could not help feeling that what Coleridge said was true, viz., "that the architecture of our churches was simply the expression of religion." He could not help feeling that the religious life of the middle ages made itself felt in every single detail of the buildings that were erected, and he could not conceive that Salisbury Cathedral, for instance, did not have one mind starting the idea of its plan, and seeing to the whole scheme—not perhaps as the professional architect saw to it now, but nevertheless guided throughout by one master mind. That guiding in particular showed very strongly the mind of one man marked throughout. He felt inclined to say "What's in a name?" It did not matter if it was the architect to-day and the *magistri* in the mediæval days. One felt that we were growing gradually from what had existed, but we could not believe that such an absolutely different system existed in mediæval times. Of course the professional idea did not exist in the middle ages, but the same system, to an extent, to a master mind designing and controlling the erection of a building must have existed then, and indeed since building itself existed. He quite felt that Mr. Prier had given sufficient proof of the influence the monks had had on ecclesiastical art; they made it part of their religious life to work in churches. Take a church like Woodstock—a little church where one saw in the carving almost the expression of the monks when they did the capitals of that building—so real was their interest and pleasure in the work they were doing. That sort of nobly religious and sympathetic feeling was certainly not brought about only by outside masons brought from abroad, though there was no doubt the monks were often helped by them, but the work was taken up by the ecclesiastics of the time, and made part of their religious community life. He could not help thinking that the strong distinction Mr. Prier had drawn between architect and workmen of to-day, would not apply very much to the past. The architect undoubtedly was much more of a workman, and no doubt put his hand to the chisel; still, he was the man who conceived and drew the great scheme. He (the speaker) was glad that the subject of Gothic architecture was not being neglected by the Association. The idea that Gothic architecture was dead had got about recently. In one sense, perhaps, that was true, but Gothic architecture could never be dead. It had much more vitality and life in it than to be killed by the fads and fancies of the modern day. He expressed the hope that the study of Gothic architecture would not be neglected by students, and that the great spirit which had brought about such exquisite art in our country—which we could almost call national art—would not be neglected. He spoke as an enthusiastic lover of Gothic work.

Mr. H. H. Statham said he was rather in opposition to the views of the lecturer, to whose paper he had listened nevertheless with great pleasure, as the work of a cultivated and thoughtful mind. But he could not understand the anxiety there seemed to be amongst some people in the present day to make out that there was nothing in the middle ages analogous to the architect as we thought of him. It was amusing to him (the speaker) in another way, for only the previous evening, in a paper on the west fronts of English cathedrals read at Sheffield, he came to the opposite conclusion to that which Mr. Prier had tried to establish. When Mr. Prier referred to what he called the tame repetition in the design of some of the French cathedrals, he (the speaker) agreed that there was far greater variety in the design of English cathedrals. But let them look less at mere documents and more at the internal evidence of buildings. He did not see why it should be assumed that the person whom we call "architect" in modern times did not exist in the middle ages because he was not known by that name, and he did not see how some buildings would have got their very remarkable individuality except from the imagination of one mind. He would suggest that the real difference between the

architect and the mason was something like the difference between the sculptor and carver; the sculptor must be able to carve with his own hands, but he also imagined the figure; whereas the carver only reproduced from some well-worn model. But was not an architect a man who thought in stone, and thought out his conceptions? and a mason the man who knew how to set that out and put the stones together? Mr. Prior had referred to two or three cases of people who were given certain advantages because they were good builders, not because they were good designers of buildings. Did Mr. Prior mean to tell them that Bishop Gundulph put on the apron and worked with the chisel on the stone? If not, what did he do? Did Gundulph go about and tell the others what to do? If so, how was that essentially different from making a drawing and giving directions on paper? which, after all, was only an easier way of showing the workmen what to do. Coming to illustrations of individual work, there was one instance which appeared to him almost conclusively to prove the exercise of the individual mind, and that was the remarkable case of the west fronts of Ely and Peterborough Cathedrals. In Ely we found a west front which was totally different from anything to be found in England; it was a screen front of an Italian type, with a centre door. There was evidence to show that at the time that was built the front of Peterborough was much less magnificent than what it is at the present day, and it was clear that the present front was commenced just at the time Ely was being built. When the people of Peterborough saw what was being done at Ely, they became dissatisfied with their own west front, and they introduced a new and magnificent design in front of the old—the design of the three magnificent arches which we now know. Could there be two such features so absolutely different as the front of Ely and the front of Peterborough, carried out within a generation of each other by people who could almost see one building from the other, unless there were an individual designer in each case? He did not see how such a result could be possible if those two buildings were produced merely by a number of masons. From whose head did the conception of those three grand arches at Peterborough come? for it must have come from the head of some one man; he may not have been called an architect, but he must have performed functions similar to those which the architect of to-day carried out. The mistaken idea seemed to be that because no such name as architect had been used, except once or twice, and then in a different sense, there then was no such person as an original thinker in mediæval building. As to the traditional treatment of mouldings and ornament, it was perfectly clear that there was a school for that kind of work, and one found the same kind of mouldings everywhere; but in regard to the west fronts of our cathedrals, there was great variety of conception and treatment. It was impossible to imagine that being so without admitting that one mind in each case conceived the idea and gave the instructions to carry it out.*

Mr. Francis Hooper said he had the pleasure, when studying in Yorkshire (which he regarded as the home of the most beautiful Gothic work), of meeting the late Rev. Mackenzie Walcott, who was studying in connexion with a book on the Cathedrals and Convents of the country. One may learn a great deal from a lay enthusiast, and the Canon seemed able to throw those he met back into the Middle Ages, so great was his grasp of, and intimacy with, the life of the monks; and he described many of the characteristics and habits of the Cistercians and Benedictines, explaining why the buildings they occupied differed in plan and arrangement. He (the speaker) believed he was right in stating that the Canon explained the methods of work and the tradition which was followed in those days as the migration of workmen collectively from one building to another. That any body of workmen could move and work without a responsible head seemed to be absolutely impossible, but with that head everything seemed simple; and whether he was called by the name of master of the work or by the Greek name of architect seemed to be of very little consequence. No doubt he was frequently in holy orders. If

he commended himself to his patrons, he and his fellow-workers were invited to undertake work elsewhere, so taking traditions from one place to another, but always working under the master mind. All would recollect the extremely interesting speech made by the late Bishop of London on the occasion of their annual dinner—how he explained his theory in regard to the increasing magnificence and the progress of church building in this and other countries, and in an interesting way how he showed that the progress of the art of architecture was largely due to the rivalry of the religious houses. Gothic work was almost entirely confined to church work, and implied self-genial, which, in our commercial age, scarcely exists. Men in those days delighted to devote their whole lives to their work, believing in principles which are foreign to many people of the twentieth century. He (the speaker) believed that the late Mr. Pearson used to send from one building to another the same set of workmen of a given employer who worked for him thus again and again. Such men became intimate with each other, and knew what the architect wanted, and he knew what they could do. He believed the late Mr. Sedding did much the same among his Cornish churches. In restoring those churches he often went to the same builder, and the same workmen were employed again and again. This seemed a modern parallel of what was done in the Middle Ages under different conditions, and appeared a possible way out of present-day difficulties. There were many difficulties in producing good architecture to-day, but, fortunately, there were many men who could do uncommonly good work in spite of all. The tap-root of the difficulties was commercialism, work being generally given to the man who tendered lowest.

The Chairman, in putting the vote of thanks to the meeting, said that the paper was a delight and a pleasure, and not for that evening alone, but would be so during excursions and holidays, enabling them thoroughly to enjoy the work they devoted themselves to. There was an old print in the British Museum of the supposed architect of St. Albans showing his design to the King. What did Mr. Prior think about that? It was rather discouraging to hear Mr. Prior's remarks about sketching; if they had to abandon sketching, they would do so with very great sorrow. In Mr. Prior's view our professional system must be radically changed if we were to have a national architecture again. How was it to be changed? The modern architect was a development, and he appeared to be still developing, and it would seem to be impossible to change his present constitution—certainly not suddenly. One or two lessons might be learnt from Mr. Prior's paper, and they must be perfectly clear to every one. One was that architects must be content to leave more to the craftsman, both as to the work and as to the design, though it appeared to him (the speaker) that the architect must keep a general control so as to get harmony throughout his building. Then we must have what Mr. Prior beautifully described as the passion for building. They should get thoroughly saturated with the love of architecture, with the beauty of it—as an Association or Guild—in order to bring about its promotion. It seemed to him that architects should do everything in their power to stimulate public opinion as to the importance of beauty in architecture, and he was quite sure that nothing like the care and thought and effort had been devoted to that particular point which might have been. It was true that something was just beginning to be done, and, in his opinion, the University Extension Lectures were doing more than anything else at the present time to help on a national appreciation of architecture. He thought that Mr. Hooper's point as to the practice of the late Mr. Pearson and the late Mr. Sedding in regard to the employment of the same builder was a very good one. If that practice was more extensively followed there would be a greater chance of getting a sort of continuity of work and developing ideas which were good.

The vote of thanks having been heartily agreed to,

Mr. Prior, in reply, said that he quite agreed with Mr. Carvell that it was an astonishing thing that Lincoln Cathedral should have come into existence without being designed on paper, as we design nowadays—that was, it was strange to those who had been brought up with the idea that buildings must be set up in that

way. From that standpoint it seemed absolutely incredible that a building like Lincoln should come into existence by mason-craft instead of by architect-craft. But he thought it would appear less extraordinary if they considered the circumstances a little. Lincoln remained almost the sole example in that part of England of the work of the last part of the twelfth century, for the destruction of Lincolnshire abbeys (which were mostly founded in the twelfth century) had been almost complete, so that cathedral stood almost alone, as if it had come ready-made out of somebody's mind. But really there can be little doubt that the style of Lincoln Cathedral had been prepared for in other works carried out by masons. There had been an ancestry of working masons, who carried out the work of Lincoln Cathedral not so much as an entirely new thing as it appeared to us. Mr. Prynne made some remarks which no doubt he thought were in opposition to his (the speaker's) views, but, as a matter of fact, he was very much in accord with those views. Mr. Prynne spoke of the pleasure it must have been to the monks who put their heads together and carried out certain pieces of sculpture. He was quite of that opinion, too, and he thought that the first work of the Cistercians, with their working communities, was the building of their churches; but at that time building was a common thing; it was part of the work of the whole community, very much as building is in the backwoods of America to-day—everybody coming to help when a building is put up. He did not say that; that was so all through the Middle Ages; it was evidently so only at the beginning, when society was on quite a different footing from what it was now. There were not the grades that we had now, and it was no more degrading to a monk or a bishop to handle a trowel than it was to-day for the farmer in the backwoods to put up his log hut. The idea that the work must have been carried out by inferiors in the times he spoke of was not justified at all by the evidence. [Mr. Statham: Did Bishop Gundulph work on his own building with his own hands?] Certainly, but not all day. When the chronicler referred to him as working with his own hands he meant that it was saintly to build. Mr. Prynne also referred to the difficulty of understanding how Salisbury Cathedral came to be built except from the designs of a personal designer. Well, we knew very much how Salisbury Cathedral came into existence, how the Bishop decreed it, how the administrator had charge of it, and how the mason ruled there for twenty years; and therefore Salisbury did afford evidence of one man's mind in this foreman of masons, and Salisbury was the most monotonous of English cathedrals he knew of. But did that singleness of mind make up what we call an architect? It did not seem so to him, and he regarded it as an accident in the making of the cathedral, which made it duller than it otherwise would have been. Mr. Prynne also suggested what was very far from his (the speaker's) mind, that we English introduced masons from abroad to do our buildings. Except in very early ages—before, in fact, building had taken any hold in England—this was not the fact. The introduction of stone building must have come from somewhere, and he thought the evidence was strong that it came in from abroad after the seventh century, when the missionary bishops first brought Christianity to England. That was a different thing, however, from saying that our masons were continually being brought from abroad, for the cases in which that had occurred were so few that one might disregard them. Nowadays we thought that plan and design must go together; so we had difficulty in seeing how, in the Middle Ages, plan and mason craft were not one thing, but two. Mr. Statham had a very distinct way of looking upon the art of architecture, and he clearly thought that it was by a sort of intellectual process that the elements of art were brought into a certain form and produced a certain result. It might be an incapacity on his (the speaker's) mind in understanding what intellect is, but he did not agree with that view at all. Art ends when intellect begins, and he had not the least doubt in regard to the difference between the west front of Ely and the west front of Peterborough, that there was some intellectual mind at work which thought that those three great arches would look very fine at Peterborough, but he did not think this process of intellectual conception made the art

* These remarks are nearly a repetition of those in Mr. Statham's paper read at Sheffield the evening before, and also printed in this issue; but as Cuddie Headrigg said, "A gude tale's name the waur o' bein' twice tauld, and a body has aye the better chance of understandin' it!"

of Peterborough. It lay in the whole shape—in the feeling, expression, sculpture, the whole of the building, and not in anything which could be called a designing process, such as an architect now is perfectly capable of doing. He believed there was in the case of Peterborough someone who had to determine that sort of thing up to a certain point, for there were contracts which showed how authority settled how many feet broad or high a building was to be, and no doubt there was some one at Peterborough who decided there must be three arches. [Mr. Statham: That is all I want.] Yes, but the points of view were different. In regard to what McKenzie Walcott had said about companies of masons going from one church to another, it was almost certain, from the records which remain, that that was the case. But he had not found the least evidence that these masons went from place to place under the headship of a master mason whose designs they carried out. [Mr. Hooper: Canon Walcott did not mean that all work was done so; no doubt local men were employed in some cases.] The masons might have gone to and from abbeys in Yorkshire, for instance, but he did not think there was any evidence to show that they migrated from Yorkshire to Devon, for there was such a difference in the different crafts in the different parts of the country that it did not seem possible that masons could have travelled systematically as a body, except perhaps in their own county. In reply to the chairman, he had to confess that he had not seen the drawing of the architect of St. Albans handing his design to the king, but he might mention that Viollet-le-Duc, in the frontispiece of his book, showed a mediæval architect dictating his plan to the monk, but no document or record remained to support this relative position. The evidence was the other way—that the monastic authorities—the bishops, canons, and monks—held a tight hand on their masons, and there was no dictating by the mason to the authority; he had to do what he was ordered. Wilars de Honne-court was well known by his book of drawings—his sketch-book as it was called. He believed there were eighty-three of these drawings, and nearly two-thirds of them were drawings of the figure, nearly half of the remainder being drawings of "machines" for various purposes. One was a drawing of a lectern on which, he wrote, "This is the best sort I make." Then there were drawings which were copies of well-known places, chiefly bits of Rheims. In all the drawings there was only one thing which had not been copied, and that was a plan, as to which he wrote, "I designed this"—designed, invented, or whatever they liked to call it—"with Peter de Corbie in dispute with him." Evidently the sketch-book was not the sort of thing we were accustomed to nowadays, and it was really no proof that the masons made drawings from which buildings were erected. The whole point of his inquiry was whether in the Middle Ages there was a class of designing architects; there may have been people who supplied ideas for building as architects do now, but the real architects were the masons who worked with their hands and carried out what they thought. No doubt, as Mr. Statham had pointed out, there was a difference between the sculptor and the carver, and so in regard to the erection of buildings some master mind controlled. But these were not like architects of the present day, because they lived on the work and worked at it. To-day architects were a class apart from the work; they did not live in it; they had another faculty specialised for them, viz., the faculty of designing apart from the work. Architects of to-day took up a little bit of the work of the mediæval builder and magnified it and multiplied it, while the greater work of the mason of those days—that was left undone. As to whether the present system could be changed, he had no thought of suggesting anything of the kind. As the chairman said, the architect had grown up by stages, and he would continue to grow as the times made him. He thought it utterly impossible to go back to the way of the mediæval builders. Whether we produced architecture by our methods, however, was another matter. As he had said before, he thought architecture would begin where the architect ended.

The Chairman announced that the next ordinary meeting would be held on March 1, when a paper on the Paris Exhibition will be read by Mr. Wonnaoot.

The meeting then terminated.

COMPETITIONS.

THE NEW TOWN HALL, AYR.—On the 11th inst., at a private meeting of the Town Council held after the ordinary meeting, a report by Mr. John J. Burnet, A.R.S.A., Glasgow, on the designs submitted in competition for the restoration of Ayr Town Hall was read. Mr. Burnet reported that the arrangements, both of the court-house and police department and of the hall in No. 1 design, appeared to him so good that he had no hesitation in placing it first. The Council unanimously adopted the recommendation of the assessor, and resolved to proceed with the erection of the hall. The successful design is that of Mr. J. Kennedy Hunter, architect, Ayr, and the cost of carrying it out will, according to the estimate of the measurers, Messrs. Douglas, Hunter, & Whitson, Glasgow, amount to 9,515*l.* The hall, with its principal accessories, will be comprised within the four walls of the original building, and its total seating accommodation will be 1,078. In connexion with the police office a new court-room is to be provided, and there are also to be matron's room, production room, chief constable's room, superintendent's room, and muster room.

BRANCH FREE LIBRARY, NINEVEH-ROAD, LEEDS.—Mr. Leonard Stokes (of London), the assessor appointed by the Corporation of Leeds, has awarded Mr. William Bakewell, F.R.I.B.A., architect, the first premium in this competition.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Battersea Borough Council 3,165*l.* for street improvements; the Bermondsey Borough Council 21,140*l.* for the erection of stables, workshops, stores, &c.; the Lewisham Borough Council 15,500*l.* for the enlargement of the Town Hall; the Woolwich Borough Council 2,340*l.* for infectious diseases shelter and post-mortem rooms; the Hammersmith Guardians 10,000*l.* for the purchase of land and premises as a site for relief offices; and the Metropolitan Asylums Board 100,000*l.* for the erection of a hospital.

Historic Buildings.—On the recommendation of the General Purposes Committee it was resolved to appoint a new standing committee, for the purpose of considering and reporting upon questions relating to historic buildings in London, and of dealing with the preservation and publication of historical records of the Council, the administration of the library, and other cognate matters.

Berlin Fire Brigade Exhibition.—The same Committee, having further considered the letter from the German Ambassador, with a prospectus of an International Exhibition of appliances and arrangements for protection against fire, which is to be held in Berlin in June, recommended that the Home Secretary be informed that the Council regretted they could not see their way to take part in the International Fire Exhibition.

Mr. Campbell protested against the action of the Committee as being discourteous to the German Government, and moved that the wish of the German Government be complied with, and that the Committee be requested to carry out the necessary arrangements.

Colonel Legge, M.P., seconded the amendment, which was rejected and the Committee's recommendation agreed to.

Electric Tramways.—The Highways Committee recommended that the estimates for 145,000*l.* and 478,500*l.* submitted by the Finance Committee be approved; that the expenditure be authorised for the purposes of reconstruction for electric traction of the Council's tramways between (a) Westminster Bridge-road and Upper Tooting-road; (b) Kennington Park-road (at its junction with Kennington-road) and the terminus at Blackfriars-road; and (c) St. George's-circus and the terminus in Waterloo-road, of sums not exceeding these amounts respectively in respect of (1) buildings and railway sidings, and (2) lines, machinery, generating plant, rolling stock, and electrical equipment. This was agreed to.

Plague Precautions.—The Public Health Committee recommended certain precautionary measures against plague, and asked for authority to expend, if necessary, 50,000*l.*

This was agreed to.

Streets and Street Traffic.—The General Purposes Committee brought up a report on the resolutions passed by the recent Conference on streets and street traffic. It was resolved to send copies to the Borough Councils for their consideration and report. We may be able to print the resolutions in our next issue.

Land Registry Office.—The Building Act Committee brought up the following report, the recommendation being agreed to:—

"We have had under consideration for some time past the scheme of H.M. Office of Works for the erection of the new Land Registry Office on the south side of Lincoln's Inn Fields, including the question of the frontages in Serle-street and Lincoln's Inn Fields. The original scheme provided that the new offices would be 50 ft. high, with a one-story building next Lincoln's Inn Fields partly on the site of the previously-existing one-story buildings and partly on the forecourt, with the boundary of the new building next Serle-street set back to the line of the area railings in front of certain buildings, a strip of land next Serle-street given up to the public way, and also with an area not less than 4 ft. deep formed round the building for the purpose of affording light to the basement. As the Council is aware, buildings vested in or in the occupation of the Government are specially exempted from the provisions of the London Building Act, 1894, relating to buildings and structures, but we deemed it expedient in the public interest to enter into negotiation with H.M. Office of Works with a view to obtaining some slight modifications of the scheme. It subsequently came to our notice that there was a proposal before H.M. Office of Works to erect the new offices 60 ft. high with two stories in the roof to within 4 ft. of the pavement both in Lincoln's Inn Fields and Serle-street. We viewed this proposal, involving the erection of a building of great height projecting 28 ft. in advance of the general line of buildings on the south side of Lincoln's Inn Fields, with very great concern, and by our direction a communication was addressed to H.M. Office of Works pointing out that the arrangement was one which the Council would not sanction in the case of a private individual, and asking that the matter might be further considered. In reply, a letter was received from the Office of Works to the effect that the suggestion to erect the new buildings to the full height over the forecourt had been made by certain authorities interested in the new offices, but that the First Commissioner shared to a great extent the views of the Council upon the question, which was still under consideration. The clerk of the Council and the superintending architect have since, with our approval, been in further communication with the Office of Works, with the result that the following letter has now been received:— . . . [The letter stated that in view of all the circumstances, Mr. Akers Douglas has decided that the building line of the square shall be, if possible, adhered to; and in any case, should it be found necessary to advance the frontage of portions of the new building, such advance shall not extend further than 6 ft. beyond the building line of the square.] The arrangement proposed by H.M. Office of Works appears to us to be a very satisfactory one from the public point of view, especially having regard to the exemption of Government buildings from the provisions of the London Building Act, 1894, and to the fact that it is not, we understand, proposed to rebuild on the site of the existing one-story buildings at the south-east corner of the square. We have therefore given directions for a letter to be addressed to H.M. Office of Works, thanking the First Commissioner for the courtesy with which he has received the Council's representations, and stating that the Council, whilst welcoming the proposal contained in the letter of February 11th, ventures to express the hope that in the contemplated re-building the original line of frontage will be maintained. We recommend that the course taken be approved."

Tender.—It was agreed to accept the tender of Mr. H. W. Budd for 50*l.* for levelling the area cleared under the Mill-lane, Deptford, improvement scheme.

Labourers' Cottages and Lodges, Farmfield.—The Inebriates Acts Committee recommended—

(a) That the estimate of 2,898*l.* submitted by the Finance Committee be approved, and that an expenditure of not exceeding that sum be sanctioned for the erection of four labourers' cottages and two lodges on the Farmfield estate, and for incidental works and expenses in connexion therewith.

(b) That the Inebriates Acts Committee be authorised to invite tenders and take the necessary measures for the execution of the works.

The recommendations were agreed to.

Petroleum Flash Point.—The Public Health Committee brought up a further report on lamp accidents, and recommended that the Home Secretary be asked to introduce a Bill to raise the legal flash-point of petroleum from 73 deg. to 100 deg.—i.e., to prevent the impor-

tation and use of the low-flash oil for the future.

The recommendation was adopted.
The Council adjourned soon after six o'clock.

CLERKS OF WORKS ASSOCIATION: ANNUAL DINNER.

The eighteenth annual dinner of the Clerks of Works' Association of Great Britain was held on Monday at the King's Hall, Holborn Restaurant. Mr. W. E. Riley, F.R.I.B.A., the Superintendent Architect to the London County Council, presided, and was supported by Professor Roger Smith, Messrs. Maurice B. Adams, F. R. Farrow, T. Blashill, J. Hebb, Chatfield Clarke, F. Plowman (President), Spencer Green (Vice-President), J. Aitchinson, J. C. Hill, J. W. Stone, J. H. Freeman, W. Woodward, &c. There were about 200 present.

After the toast to the "King and the Royal Family," the Chairman submitted "The Navy, Army, and Reserve Forces," which was responded to by Mr. J. Aitchinson.

Mr. Spencer Green, in proposing "The Architects and Surveyors," said this toast was particularly acceptable, because the architects and surveyors were their best friends, and they were pleased to have so many of them present. The ideal and aim of the members was to have the confidence of their employers—to serve the architects with unswerving fidelity—faithful and intrepid from beginning to end. By enjoying this confidence they felt that to some extent they relieved their architects from great anxiety on the different jobs, and enabled them to concentrate their best thoughts on the designs for future great works. The question of their salaries as clerks of works was of great importance to them. Some two years ago Mr. Dashwood, on behalf of the Association, asked for the support of architects and surveyors to the proposal to secure more adequate remuneration to clerks of works, maintaining that for large jobs they ought to receive six guineas per week. The architects and surveyors then present promised to do all in their power to bring about this very desirable increase. This promise, he was glad to say, had been largely fulfilled.

Mr. Thomas Blashill responded for the architects. He said that every practical architect must feel how much he was indebted to his clerk of works. It would be impossible to carry out works of the present magnitude without them—men of the greatest efficiency, who had been trained in the art of building and perfected themselves by other studies for the intricate business to which they had devoted themselves. It was only natural that as the buildings increased the remuneration of men whose duties were so onerous should increase also. It was the proper thing for any professional man when he got on in his work to look forward to be entrusted with more important duties at a higher remuneration. He would like to commend to their notice the question of the materials used in fire-proof construction. He had had something to do in regard to the safety of town buildings for many years past, and it was a great subject. They would find it to their interest to pay special attention to the matter, because before long it would be a rarity to see a building of any importance being constructed that would not absolutely resist the kind of fires which were now so frequent.

Mr. Chatfield Clarke then responded for the surveyors. He mentioned that the Editor of the *Builder* had pointed out over and over again that architects even did not get a fair recognition of their work. During the reign of our late Queen no art had gone more ahead than that of architecture, and no city in the world during the past fifty years had produced greater architects. In descriptions of buildings, however, the public were more interested in the cost than in the name of the architect. If the architect did not reap any recognition, what about the quantity surveyor? He was never heard of at all, and yet that profession had made great progress during the past half century.

Mr. Spooner, Past President, proposed, the "Worshipful Company of Carpenters," to whom he said the Association were deeply indebted for encouragement and assistance.

Professor Roger Smith, the Master of the Carpenters' Company, in reply said that this Company, like the other City Companies, was of great antiquity. In the early days there was a spice of trades-unionism about

their proceedings, but after a time the connexion with the trades dropped away. Now the connexion with the trades was being revived. This Company, by their lectures, examinations, the two technical schools which they maintained, and the house-room they gave to one or two technical societies, endeavoured to assist, as far as possible, the members of the carpenters' and joiners' trades, and in fact the whole building trade. Another method they had employed for this purpose was the holding of exhibitions of carpentry and joinery. They were going to hold an exhibition this year, and they had offered prizes for models of wooden houses. He believed that wooden houses formed one solution of the problem of housing the agricultural labourer, and he hoped that as a consequence of this forthcoming exhibition some wooden houses would be constructed in various parts of the country where they were not forbidden by by-laws.

"The Clerks of Works' Association" was then proposed by the Chairman. He said that many changes had taken place since Sir Christopher Wren was clerk of works at St. Paul's Cathedral. Their work was the emblem of the great morals of the world in representing construction as against destruction. There was a great moral lesson in the growth of a building, and its finished condition, when it was well done, was a moral example. He noticed in the qualifications in connexion with this Association one that stipulated that no man was eligible for membership until he had practised his art for three or four years and attained the age of forty years. It was an excellent rule to see that their members were properly qualified, but he thought some men might be qualified before they were forty. He was glad to see that they stipulated that the members should have a technical knowledge of carpentry, because his experience was that the best clerk of works was one who understood this. He also highly approved the qualification that the members should be good sanitarians. With regard to the question of remuneration, he considered that there were few men engaged in work of this importance who were so badly paid as clerks of works. He trusted that the matter would be brought to a successful issue.

Mr. F. Plowman, the President, in response said the Association was founded nineteen years ago, and he was pleased to see many of those who originated it present that evening. It was their desire to raise the status of the Association, and they looked to the Royal Institute of British Architects and the Institution of Civil Engineers to assist them. The Association was of great usefulness, its papers, lectures, and meetings being of great advantage to the members. In regard to the question of remuneration, he condemned the system of public bodies like the London County Council paying three and a half guineas per week only to clerks of works.

Mr. J. Davies, in proposing "The Visitors," said that evolution of clerks of works commenced, not from the time of Sir Christopher Wren, but from the time of the building of Solomon's Temple, when Hiram was obviously the clerk of works.

Mr. J. C. Hill expressed the thanks of the visitors, and suggested that a benevolent fund should be formed in connexion with the Association.

Toasts to the Hon. Treasurer (Mr. G. Oldrid Scott) and the Chairman concluded the proceedings.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.—

Lines of Frontage.

Hackney, Central.—A one-story addition to Sussex Cottage, No. 10, Kenninghall-road, Upper Clapton, at the corner of London-road (Mr. S. A. Smith for Mr. M. Smith).—Consent.

Bethnal Green, South-West.—One-story shops on part of the forecourts of Nos. 86 and 88, Old Bethnal Green-road, Bethnal Green (Mr. C. B. Hollist, jun., for Mr. C. Sully).—Consent.

Fulham.—A coal-cellar in front of a bakehouse at the rear of a house and shop on the west side of Tamworth-street, Fulham, at the corner of Raclon-road (Mr. W. Cave for Mr. J. Wendon).—Consent.

Hammersmith.—Five dwelling-houses on the west side of Pennard-road, Shepherd's Bush (Messrs. G. Leyford & Son).—Consent.

Barnodesey.—Retention of a temporary one-story shop on the forecourt of No. 254, Southwark Park-road, Barnodesey (Messrs. Pearks, Gunston, & Tee, Limited).—Consent.

Lewisham.—Two houses on the west side of Newlands Park, Sydenham, at the corner of Homecroft-road (Mr. E. Bates for Welford's Surrey Dairies, Limited).—Refused.

Barnodesey.—The retention of a wood and glass show-case, attached to the front of No. 32, Jamaica-road, Barnodesey (Mr. J. Harries for Mr. E. Ellis).—Refused.

Barnodesey.—One-story shops on the forecourts of Nos. 61 to 73 (odd numbers only), Lower-road, Rotherhithe (Mr. T. W. Biggs for Mr. S. Single and Messrs. Stansfeld & Co., Limited).—Refused.

Dulwich.—A warehouse building the south-east side of Green-lane, Penge (Mr. E. Williams for Mr. A. Olby).—Refused.

Projections.

St. George, Hanover-square.—The retention of an iron and glass shelter in front of the porch of the Coburg Hotel, Carlos-place, St. George, Hanover-square (Mr. F. W. Anson for the Coburg Hotel, Limited).—Consent.

St. George, Hanover-square.—An additional story to a bay-window at No. 52A, Berkeley-square, St. George, Hanover-square, next Charles-street (Mr. Macartney).—Consent.

Wandsworth.—Six balconies in front of a block of residential flats to be erected on the south side of Lower Richmond-road, Putney, at the corner of The Flat (Messrs. Falgrave & Co. for Mr. G. Crowden).—Consent.

Woolwich.—A wooden portico, two wooden bay windows, and wooden barge-boards at the Red Lion public-house, Shooter's Hill, Plumstead (Mr. J. O. Cook for Mr. C. Beasley).—Consent.

City of London.—That Mr. P. B. Tubbs be informed that the Council is not prepared to accede to his request for an extension of the periods within which the erection of an iron landing at the first-floor level in front of No. 26, Paper-street, City, was required to be commenced and completed.—Agreed.

Width of Way.

Poplar.—A one-story addition at the rear of the Railway Tavern, West India Dock-road, Poplar, at less than the prescribed distance from the centre of Garford-street (Messrs. Yetts, Sturdy, & Usher for Mr. C. Brown).—Consent.

Mile End.—A temporary brick and iron church at the rear of No. 381, Mile End-road, Stepney, at less than the prescribed distance from the centre of Linton-road (Mr. F. A. Walters for the Rev. W. Donlevy).—Consent.

Lines of Frontage and Width of Way.

Hammersmith.—An extension of the periods within which the erection of two dwelling-houses on the western side of Goodwin-road, Greenside-road, Hammersmith, was required to be commenced and completed (Mr. F. S. Hammond).—Consent.

Woolwich.—A stanchion and projecting stonework to an addition to the London Music Hall, High-street, Shoreditch, at less than the prescribed distance from the centre of Jane Shore-court, and in advance of the general line of buildings in that court (Mr. F. Matcham for the London Music-hall Company, Limited).—Consent.

Brixton.—A block of residential flats on the site of Nos. 400 and 402, Coldharbour-lane, Brixton (Mr. G. Windsor for Mr. A. G. H. Brown).—Refused.

Clapham.—Ten houses with bay-windows on the eastern side of Loats-road, Clapham, and of seven houses with bay-windows on the western side of Lyham-road (Messrs. Down Bros. for Mrs. R. S. Gray).—Refused.

Hammersmith.—Two blocks of buildings on the west side of Ravenscourt-park, Hammersmith, one on each side of Hamlet-gardens (Mr. T. Athley for Mr. W. H. Gibbs).—Refused.

Width of Way and Space at Rear.

Whitechapel.—Deviations from the plan certified by the District Surveyor, under Sections 13 and 43 of the Act, so far as relates to the proposed rebuilding of the back portion of Nos. 16A and 17A, Bell-lane, Spitalfields (Messrs. Wigg, Oliver, Hudson, & Co. for Mr. N. Frost).—Consent.

Greenwich.—That the application of Mr. R. Whaley for an extension of the periods within which the rebuilding of No. 223, Trafalgar-road, East Greenwich, to abut also upon Colomb-street, was to be commenced and completed, be granted.—Agreed.

Width of Way and Dispensation of By-law.

Deptford.—A one-story addition to a saw mill at the Baltic Saw Mills, Blackhorse-road, Deptford, with the boundary fence at less than the prescribed distance from the centre of the street, and without the site of the addition being covered with a layer of good concrete at least 6 in. thick, as required by such by-laws (Mr. H. E. Newton for Mr. A. Capon).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. J. Briggs, for the Housing Committee of the Council,

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURE IN CRETE AND TURKEY.

SIR,—In connexion with my essay on this subject published in your last week's issue, I should like to call attention to the similarity in interior design of the Green Turbsh at Broussa (mentioned in my paper) and a tomb at the Mosque of Bajazet II. at Constantinople. When walking round the South Kensington collection the other evening I noticed a water-colour drawing of the interior of the Bajazet Tomb, by the late J. F. Lewis, R.A., which might have been copied, in every particular, from the earlier tomb at Broussa.

I should like to add that two of the photographs illustrating Candia published by you last week were taken by Mr. D. G. Hogarth—the back of the Armoury, and the Turkish Arches in the main street. The others, as you stated, were taken by Mr. F. B. Welch.

Also, I should have said that a later Greek and not a later Roman settlement existed beside the ancient remains at Ghoulas, in Crete.

D. T. FYFE.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

8.—LAVATORIES.

THE material generally used for household lavatories is white earthenware or pottery, commonly known as porcelain, or by some special name such as queensware. Better fittings are now made of a semi-vitrified porcelain, while for the strongest lavatories enamelled fireclay is often adopted. Cast-iron basins are also made, enamelled in various ways.

The ordinary lavatory, with pottery overflow for connexion with lead pipe and with plug waste, is too well known to need illustration. It is generally defective in several important details—the overflow is too small to carry off the water from a high-pressure service, and cannot possibly be kept clean, and the waste is too small to admit of the basin being emptied with sufficient rapidity either for convenience in use or for cleansing the trap and waste-pipe. The grating under the plug is also so small, that it is soon choked with hairs, soap, &c., and is placed at such a depth that these cannot easily be removed. At one time the dishes for soap and brushes were sunk below the slab, and the water drained away through small holes into pottery nozzles, from which it was conveyed by small pipes to the trap under the basin. These holes and pipes were difficult to keep clean, and have long been superseded by simple grooves which convey the water from the dishes directly into the basin.

The improvement of the overflow was the next stage. In order to simplify the plumber's work, the overflow was formed entirely in pottery from the overflow openings to the waste-outlet, a perforated washer being used for the plug, as shown in fig. 7, chapter 7 (page 167 ante). This overflow was quite as difficult to clean as the old-fashioned pipe, and a further improvement was effected by continuing the overflow tube up through the slab in the manner described and illustrated in the chapters on sinks. The opening in the slab is generally fitted with a loose porcelain or metal cover. Such an arrangement is shown in fig. 1; in this case a safety plug with spindle and knob takes the place of the ordinary plug and chain, the advantage being that the plug cannot be removed, that the basin cannot be damaged by letting the plug fall upon it, and that the grating is level with the bottom of the basin, and can, therefore, easily be kept clean and free from obstruction.

One of the latest modifications of this kind of overflow is shown in fig. 2, in combination with a new waste arrangement. The overflow is of large area, so as to be capable of carrying away the water from a high-pressure service, and is covered with a nickel-plated brass grating, hinged at the top. The valve, or plug, which is covered with soft rubber, works horizontally instead of vertically, and is

actuated by the lever handle at the back of the slab. The discharge grating may be of porcelain, or of nickel-plated brass hinged so that the plug and seating can be cleaned. This lavatory is known as Shailes's "Perfecto."

The standing waste-and-overflow has also been applied to lavatories. In the earlier arrangements the apparatus was concealed in a pottery chamber at the back of the basin, and was not easily accessible for cleansing; an overflow of this type is shown in fig. 3. A modified form, known as Milne's patent "Lift-out" accessible waste, is illustrated in fig. 4; the chamber is of good size, and the standing waste, together with the knob and shield, can be removed by a simple pull, and can be pressed back into position with equal ease. The shape of the chamber is better than that shown in fig. 3, as the long acute angle at the bottom of the latter is avoided by making the back of the basin vertical.

Other forms of standing waste are exposed to view in the basin. The "Neros" waste (fig. 5) is of this type. By lifting the knob and giving it a quarter-turn the waste is suspended above its seat, so that the water can escape through the holes in the lower portion; the holes near the top are for the overflow. Doulton's "Waverley" waste (fig. 6) is a modification of this type, and possesses some interesting features. An outlet grate is provided in the shape of a perforated flange around the bottom of the cylinder in which the standing waste slides. When the waste is raised from its seat the water escapes through the grating. As in the other types, the waste can be suspended by raising the knob and giving it a quarter-turn. The grating is fitted into a screwed washer, and can be easily removed by unscrewing it, and the standing waste can then be taken out.

One of the most recent forms of standing waste (fig. 7) is also the simplest, being nothing more than a tube of xylonite slightly tapered at the bottom to fit into the outlet washer. An arched metal bar is fixed across the top for the attachment of a chain. In other words, a xylonite standing waste-and-overflow takes the place of the ordinary brass or vulcanite plug. This waste, designed by Adams & Co., can easily be kept clean, but on account of the somewhat fragile nature of the material can only be recommended for houses and other places where the fittings will be carefully used.

The common lavatory basin is generally round or oval, but the D-shaped basin is now preferred as more convenient in use. Sometimes the central part of the front is slightly recessed, so that the person using the lavatory can stand more closely to the basin. The slab is usually in one piece with the basin, and a low pottery skirting along the back and ends also forms an integral part of the fitting. Many high-class lavatories are made with porcelain basins and marble or onyx slabs and skirting—about 1 in. thick; it is an advantage to have the slabs slightly dished (fig. 8) to prevent water flowing over the slab on to the floor. Slate slabs are used instead of marble for cheaper fittings. The bottom of a lavatory basin ought to have a good slope to the waste-outlet, so as to prevent as much as possible the deposit of soapsuds. Figs. 1 to 5 show different sections of basins.

Twin lavatories, containing two basins with slab and skirting, are now made in one piece of pottery, and, as already mentioned, combined sinks and lavatories can be obtained in a single piece of enamelled fireclay.

The most general size of lavatory slabs is about 27 in. by 20 in., but many smaller sizes are made, and also larger sizes up to about 30 in. by 22 in. A specially large lavatory made by one firm has a slab measuring 39½ in. by 28½ in., with a rectangular basin 24½ in. by 16½ in. The marble slabs used for lavatories range in size from about 30 in. by 24 in. to 36 in. by 25 in.

Tip-up lavatories were at one time much used for hotels, railway stations, and other places where it is essential that the water should be rapidly emptied, but they are not as satisfactory in other respects as the modern ordinary basin. They consist as a rule of two principal parts—the basin and the container as shown in fig. 9—and are made either of porcelain or cast iron. The basin is fitted outside with two metal bushes, one at each side, to receive the ends of two trunnions, on which the basin swings; a buffer is provided to keep the basin at its normal level. An improved form of pivot is made, so that the basin can be

sanctioning the formation or laying out of new streets for carriage traffic on the Totterdown Fields Estate, Upper Totting-road, Wandsworth, and in connexion therewith the widening of a portion of Church-lane and of a footpath leading to Totterdown.—Agreed.

Bethnal Green, South-West.—That an order be issued to Mr. H. H. Collins, sanctioning the formation or laying out of a new street, for carriage traffic, to lead from Blythe-street, Bethnal Green, to a proposed new street to be named Teesdale-street (for Messrs. Davis Brothers). That the name Aller-street be approved for the new street.—Agreed.

Islington, West.—That the period within which the street for foot traffic, to be named Macready-place, to lead from Holloway-road to Writers-road, Islington, was required to be paved, and to have posts erected so as to prevent such street being used for carriage traffic, be extended to two years from May 8, 1900.—Agreed.

Woolwich.—That an order be issued to Mr. J. O. Cook sanctioning the formation or laying out of a new street for carriage traffic to form continuation of Marmadon-road, Plumstead, into Church Manor-way, and in connexion therewith the widening of a portion of Church Manor-way (for Mr. T. Driver). That the name Marmadon-road (in continuation) be approved for the new street.—Agreed.

Woolwich.—That an order be issued to Messrs. Meakin & Archer, sanctioning the formation or laying out of a new street for carriage traffic in continuation of Marmadon-road, Plumstead. That the name Marmadon-road (in continuation) be approved for the new street.—Agreed.

Woolwich.—A variation from the plan sanctioned on October 10, 1899, for the formation of new streets upon the Eltham Park Estate, Eltham, so far as relates to the alterations in the width of the street, to be named Glensk-road (Mr. R. Stewart for Mr. A. Cameron Corbett, M.P.)—Refused.

Levensham.—That an order be issued to Messrs. H. & G. Taylor, refusing to sanction the formation or laying out of new streets for carriage traffic out of Laleham-road, Catford, on the site of the Catford sports ground.—Refused.

Width of Way and Artisans' Dwellings.

Lambeth, North.—Three blocks of intended dwelling-houses, to be inhabited by persons of the working-class, and proposed to be erected, not abutting upon a street, on a site between Gloucester-street and Burdett-street, Lambeth, and two blocks of intended dwelling-houses, to be inhabited by persons of the working-class, proposed to be erected on the north side of Burdett-street and South side of Gloucester-street respectively, with irregular open spaces at the rear, and the boundary fences of the site at less than the prescribed distance from the centres of Gloucester-street and Burdett-street (Mr. S. Bircham for the London and South Western Railway Company).—Consent.

Means of Escape from top of High Buildings.

Brixton.—Means of escape in case of fire, proposed to be provided on the fifth story of a building to be known as Ingram House, to be erected on a site on the east side of Eastcote-street, Stockwell, at the rear of Nos. 43, 44, and 46, Stockwell-road (the upper surface of the floor of which story will be above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. A. T. Bolton and Mr. C. Clark, for Ingram Houses, Limited).—Consent.

Holborn.—Means of escape in case of fire, proposed to be provided on the topmost story of the Thackeray Temperance Hotel, Nos. 56 and 57, Great Russell-street, Bloomsbury—the upper surface of the floor of which story is above 60 ft. from the street level (Mr. C. Fitzroy Doll, for Mr. J. Trustlove).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

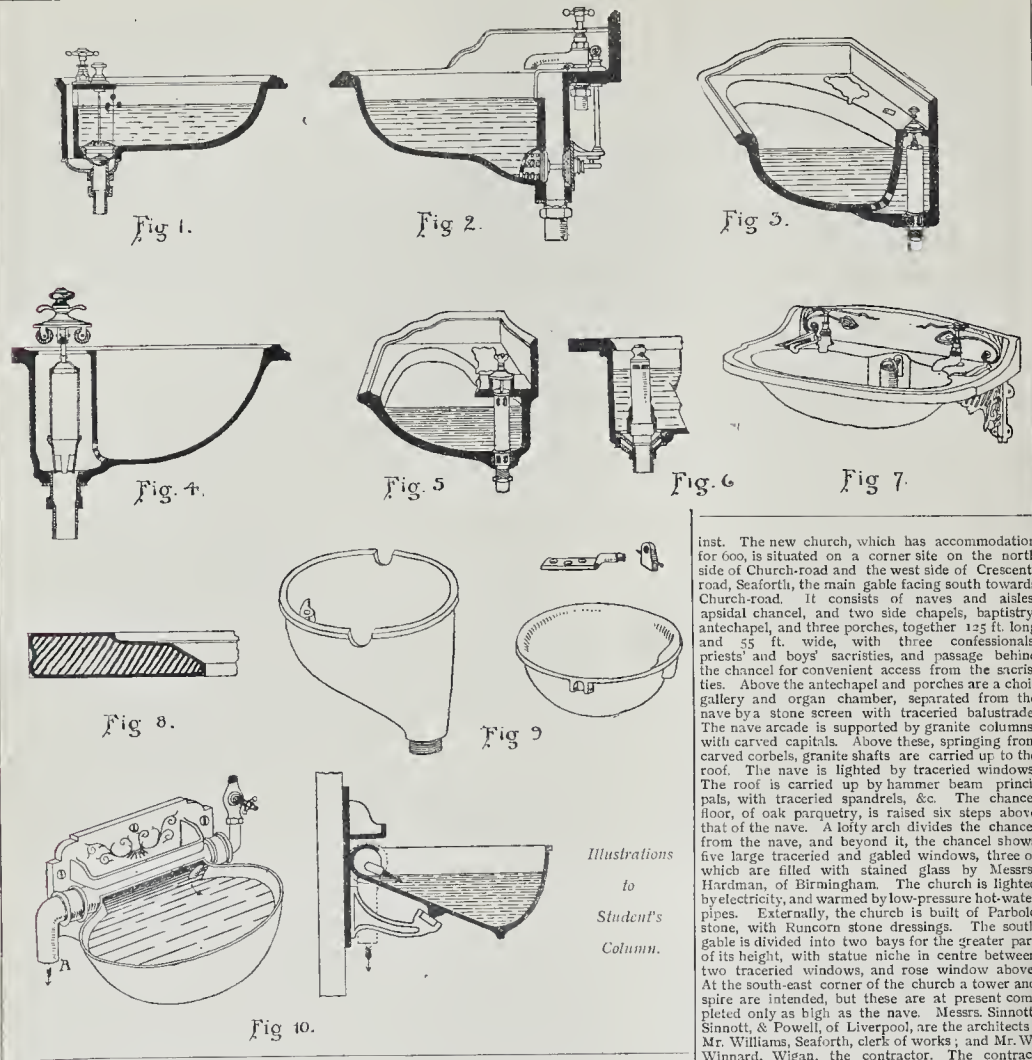
BOOKS RECEIVED.

THE CEMENT INDUSTRY. (Engineering Record Office, New York.)

LIME, MORTAR, AND CEMENT. By W. J. Dibdin. (Sanitary Publishing Company.)

BERMONDSEY: ITS HISTORIC MEMOIRS AND ASSOCIATIONS. By Edward T. Clarke. (Elliot Stock.)

ROYAL CALEDONIAN ASYLUM.—Subject to the sanction of their project by the Charity Commissioners, the London County Council have agreed to acquire at an estimated cost of 16,500l. the buildings and site covering just 2 acres, and having a frontage of 250 ft. in Caledonian-road, Holloway, of the Royal Caledonian Asylum, which was founded in 1815. The Governors of the Asylum have obtained a site of 7 acres for new schools in Hertfordshire; the London County Council propose to take the Caledonian-road property for the erection, in terms of the Housing of the Working Classes Act, 1890, of artisans' dwellings which will accommodate 1,400 persons.



Illustrations
to
Student's
Column.

removed without pulling out the pin or unscrewing the trunnion. Adams's "Tip-over" lavatory (fig. 10) is of more novel form, but is only made in "metallic-enamelled" cast-iron, and is intended for cheap work. In this the ordinary container is superseded by a horizontal outlet at the back of the basin. As shown in the illustrations, the back of the basin is curved over, and is continued in each direction as a pipe stopped at one end and connected at the other with the waste-pipe A by means of a joint which permits the basin to be raised so that the water can escape down the waste-pipe. Unless the waste-pipe is of large size, the rapidity of the discharge will be no greater than in the ordinary basin with large plug, and in any case there will be considerable risk of splashing.

The siphonic discharge has also been applied to lavatories as to water-closets, but there are certain disadvantages in the apparatus which render it of doubtful value.

Some lavatories have been made with flushing rims, so that the surface of the pottery can be cleansed by simply turning the tap. They have not proved very satisfactory, and are seldom used.

THE NEW APOLLO THEATRE, LONDON.—This theatre has been erected in Shaftesbury-avenue, next door to the Lyric Theatre. The seating capacity is for 1,200 persons. The lighting is entirely by electricity. Mr. Lewin Sharp is the architect of the building.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, LLANISHEN, GLAMORGANSHIRE.—A new Wesleyan Methodist Chapel was opened at Llanishen recently. The edifice is erected in the centre of the village, and is approached by a broad thoroughfare branching from the main road from Cardiff to Llanishen. The accommodation is for about 275 people. A gallery has been erected at the northern end to contain the organ, choir, and supplementary seating, and it is intended in the future to extend this gallery along the sides of the building. An assembly-room, some 30 ft. in length, has been erected at the rear to be used for school-room purposes. The building, which has been erected from plans by Mr. E. Seward, is of Newbridge stone with Bath stone dressings, and is in the late Perpendicular style. The total cost of erection is 1,500.

METHODIST CHAPEL, HILLSBRO, SHEFFIELD.—It is proposed to erect a new Methodist chapel at Hillsbro', on Langsett-road, from the design of Mr. John W. Firth, of Oldham. The building will be a lofty structure, and at the corner, to the left of the main entrance, it will be surmounted by a spire. Choir and ministers' vestries will be provided, along with a gallery at the end of the building, over the main entrance, and when completed the church will be capable of providing seating accommodation for from 450 to 500 persons. At the rear, adjoining the main structure, will be placed the large school. The school will afford accommodation for 350 persons, and classrooms will be provided, including a room for a men's class. The entrance to the schools will be from the side street.

CATHOLIC CHURCH, SEAFORTH.—The new Catholic church at Seaforth, which is dedicated to Our Lady Star of the Sea, was opened on the 10th

inst. The new church, which has accommodation for 600, is situated on a corner site on the north side of Church-road and the west side of Crescent-road, Seaforth, the main gable facing south towards Church-road. It consists of nave and aisles, apsidal chancel, and two side chapels, baptistry, antechapel, and three porches, together 125 ft. long and 55 ft. wide, with three confessionals, priests' and boys' sacristies, and passage behind the chancel for convenient access from the sacristies. Above the antechapel and porches are a choir gallery and organ chamber, separated from the nave by a stone screen with traceried balustrade. The nave arcade is supported by granite columns, with carved capitals. Above these, springing from carved corbels, granite shafts are carried up to the roof. The nave is lighted by traceried windows. The roof is carried up by hammer beam principals, with traceried spandrels, &c. The chancel floor, of oak parquetry, is raised six steps above that of the nave. A lofty arch divides the chancel from the nave, and beyond it, the chancel shows five large traceried and gabled windows, three of which are filled with stained glass by Messrs. Hardman, of Birmingham. The church is lighted by electricity, and warmed by low-pressure hot-water pipes. Externally, the church is built of Parbold stone, with Runcorn stone dressings. The south gable is divided into two bays for the greater part of its height, with statue niche in centre between two traceried windows, and rose window above. At the south-east corner of the church a tower and spire are intended, but these are at present completed only as high as the nave. Messrs. Sinnott, Sinnott, & Powell, of Liverpool, are the architects; Mr. Williams, Seaforth, clerk of works; and Mr. W. Winnard, Wigan, the contractor. The contract amount is between 10,000. and 11,000. The greater part of the carving has been executed by Mr. P. Honan, of Liverpool.

FREE LIBRARY, BRISTOL.—The new North District Library, Cheltenham-road, Bristol, was opened on the 13th inst. The building was designed by Mr. Gough, and erected by Mr. Wilkins.

CHANCELLOR MEMORIAL CHURCH, BELFAST.—In College-street South on the 9th inst. the foundation-stones were laid of this edifice. The new structure is being built on the site of the old Reformed Presbyterian Church. The site of the old church and schools has been taken, and on this building operations are being carried out. In College-street South the front is occupied by a vestibule and entrance to the church. Opening off the vestibule are classroom, library, and cloakroom accommodation. A separate entrance will give access to the library and schoolroom, so that these portions of the buildings can be used for week-night meetings independent of the church. The interior of the church is 60 ft. long by 44 ft. wide, with a small end gallery. It is lighted by windows grouped in pairs between each roof principal. The gable end of the edifice will be occupied by a pulpit of pitch pine, with a panelled and cusped front. In front of this at a lower level will be the platform, with choir seats at sides and open space in centre for communion. Behind the pulpit will be an arched recess. The seating is to be of selected pitch pine. Artificial lighting will be by electricity throughout the premises. The school and classroom accommodation is arranged for all purposes that the buildings will be used for, either for the Sabbath-school or for congregational meetings. On the first floor the lecture-hall will be 44 ft. long by 24 ft. wide, and a classroom at one end can be opened up to supplement the accommodation of this hall by means of a sliding partition. Accommodation is provided for a

caretaker's residence. The exterior of the church is of red brick, with red stone dressings. Mr. Thomas M-Millan, the builder, is carrying out the work from the plans and under the superintendence of Messrs. J. J. Phillips & Son, architects.

SUNDAY SCHOOL BUILDING, PENISTONE, YORKSHIRE.—Memorial stones have been laid of a Sunday-school building at Penistone. Mr. J. W. Firth, of Oldham, is the architect.

BUSINESS PREMISES, BELFAST.—No. 39, High-street, Belfast, has recently been altered to accommodate a clothier's business. The work was carried out under the supervision of Mr. W. J. Fennell by the following contractors:—Mr. J. Andrews, the shop-front; Mr. W. Agnew, the interior alterations and fittings; Messrs. Gilmore & Lytle, the electric lighting; painting and ceiling decorations, Mr. John Moore, a and polishing, Mr. Edward Killen.

OXFORD BOARD SCHOOLS.—Accommodation for boys has been provided in Gloucester-green, Oxford, a girls' school and pupils teachers' centre has been erected in New Inn Hall-street, and the East Oxford School in Union-street, Cowley-road, is approaching completion, the total estimated cost of sites, buildings, and equipment being 35,000. The Central Girls' schools are situated in New Inn Hall-street, and besides accommodation for 270 girls, contains a cookery centre, where some fifty children can be taught cookery, and also a pupil teachers' centre for 100 pupil teachers, male and female. In designing these buildings, the Board were of opinion that they should be of such a nature as to hold their own, as far as possible, with the colleges, which are in close proximity, as it was thought an ordinary brick School Board building, such as is often seen in other towns, would be out of place in the heart of a University city; hence a stone front was adopted, and some degree of dignity was aimed at. The roofs are all covered with Yorkshire stone slates, which are much larger than the stone slates usually seen in Oxford. There is also a turret containing a bell.

It was found necessary to have four entrances and two staircases abutting on New Inn Hall-street. Two have been arranged to open direct on to the pavement, these being for the pupil teachers, and two for the girls into the forecourt. Over these two latter doorways are carved panels representing Life and Knowledge, Life being represented by the pomegranate tree and Knowledge by the myrtle. On each tree seven doves are introduced, representing the seven gifts of the Holy Spirit. The forecourts enclosed by an iron railing, with gateway in same. On the ground floor the girls' school is arranged round a large hall, off this hall open five classrooms. The cookery centre is raised on columns in the playground, underneath being a covered playground for the girls in wet weather. The accommodation consists of a room about 27 ft. by 25 ft., where the cooking is taught; also a cloak-room and a scullery, which latter opens off the cookery classroom. The classroom, besides having a close range, has also an open fire range and gas stove, so that children can be taught to cook on the various stoves most commonly found in their homes. The two staircases before referred to lead to the first floor, where there are three classrooms for the pupil teachers, besides their cloak-rooms, &c., and a room for the teachers themselves. The classrooms are all arranged so as not to overlook the street, thus avoiding the noise. Messrs. T. H. Kingerlee & Son, of Oxford, have erected the schools.

The Central Boys' School is situated in Gloucester-green, where the Board had acquired property on which stood some rather picturesque old cottages. The Board consulted their architect as to the possibility of incorporating any of these cottages in his design for the new school. Mr. Stokes, however, reported that this would be very detrimental to the school itself, and reluctantly advised the Board to abandon the idea. It was then decided to try and give the new school somewhat of the picturesque character of the old cottages, hence the stone bay windows overlooking the market place, these bay windows lighting cloakrooms on the ground floor, and the master's or committee rooms, &c., on the first floor. The cloakrooms, &c., are kept to this extent as considerable noise at times goes on in the market place. The material used for the exterior, apart from the bay windows just described, is of two kinds of brick, arranged in panels and bands. The roofs are covered with Yorkshire stone slates, and there is a bell turret. Over the principal entrance, which is Gothic in character, is a carving presenting on one hand King Alfred, and on the other St. Frideswide, both in the act of instructing children. The site being an exceedingly irregular one, a feature in the shape of what is practically a regular central hall, was adopted, off which are classrooms to accommodate 220 boys. The same system of warming and ventilating as at New Inn Hall-street schools is adopted. Over two of the classrooms is placed a manual room, some 45 ft. long by 22 ft. wide, where boys will be instructed in some useful trade, such as carpentry. This room is approached by a separate and independent staircase, so that boys belonging to other schools can attend the classes, in the same way that girls receive instruction in other schools will be taught cook at New Inn Hall-street. This school has already been in use for some little time, and was erected by Mr. John Woodbridge, of Oxford, besides the two school buildings just described, the

Board is erecting a third, which is rapidly approaching completion at East Oxford. This consists of three departments, viz., boys', girls', and infants', arranged to accommodate a total of about 400 children, with provision for an extension to hold about another 100. In addition, there is a cookery centre, similar to the one at New Inn Hall-street, and a manual room for the boys of a like nature to that at Gloucester-green School. The site, having once been a brickfield, where extensive excavations had taken place, the building had to be arranged to stand where practicable upon the unexcavated part of the ground, hence the somewhat irregular arrangement. Room for the infants' school, which is a separate building, could not, however, be found on the solid ground; it has, therefore, been placed on a concrete raft, and "floats" on the made ground between the old excavations. This school has been erected of brick throughout, and is covered with a tile roof. The infants' school, which, as previously stated, is a detached building, when completed will have four large classrooms, opening off a spacious central hall, where musical drill, &c., can take place. The boys' and girls' schools are placed in one block, the girls being on the upper floor. The plan of these two floors is practically identical, and, when completed, each will consist of a large central hall and four classrooms. These buildings are nearly finished. Messrs. Boxall & Sons, of Pangbourne, are the builders. The architect for all three schools is Mr. Leonard Stokes, of Westminster.—*Oxford Chronicle*.

COTTAGE HOSPITAL, SELBY, YORKSHIRE.—A cottage hospital, at the bottom of New-lane, opposite the School of Art, Selby, was opened on the 16th inst. The building has two stories, and is of brick with stone dressings. On the ground-floor are waiting-room, dispensary, matron's room, store-room, accident ward, and bathroom. The height of the ward is 12 ft., and the walls are plastered in Portland and Parian cement. The floors are of pitch-pine boards, and the place is heated by means of a Shorland stove. Upstairs are three bedrooms, and adjoining are the bathroom and linen-closets. The roof is covered with Penrhyn slates and Staffordshire red. The cost of the building has been about 1,500. It was erected by Mr. T. S. Ullathorne, of Selby, from designs by Mr. Brownlow Tompson, of Hull.

WAREHOUSE, LEEDS.—It is proposed to erect a new warehouse in Wellington-street, Leeds, from designs prepared by Messrs. Corson & Jones and Perkin & Bulmer, architects, Leeds. The principal elevation will be 186 feet long.

PROPOSED REBUILDING OF LIVERPOOL CHILDREN'S INFIRMARY.—At the recent annual meeting of the subscribers to the Liverpool Infirmary for Children, a report was read which stated that owing to an outbreak of diphtheria the infirmary, which is situated in Myrtle-street, had been closed for six weeks during the past year, when structural alterations to improve the sanitary condition of the infirmary had been carried out. Another outbreak having occurred, Mr. T. W. Cutler, of London, was consulted. Mr. Cutler submitted a plan for extensive alterations at an estimated cost of 30,000. However, as the proposed alterations would entail a reduction in the number of beds, it has been decided to erect an entirely new building at a cost of 50,000.

CHURCH INSTITUTE, RIPON.—Premises which have been erected in High Skelgate for the Ripon Church Institute were opened on the 8th inst. The building contains a reading-room 28 ft. by 10 ft. Mr. T. Wall, of Ripon, was the architect, the contractors being Messrs. Mr. J. H. Coldbeck, the masonry, carpentering, and plastering; Messrs. Benson & White, the plumbing and glazing; Mr. J. Baynes, the slating; and Mr. A. J. G. Almond, the painting. The stoves, tiled hearths, &c., were supplied by Mr. W. E. Dixon.

SANITARY AND ENGINEERING NEWS.

WATER PUMPING STATION, FRAMPTON COTTRELL, GLOUCESTERSHIRE.—A new engine-house and pumping engine have been erected at the West Gloucestershire Water Company's works at Frampton Cottrell. The engine was started on the 11th inst. Mr. E. D. Marten was the engineer. The pumping plant has been made and erected by Messrs. Easton and Company, Limited, of Erith, and the engine-house has been built by Messrs. Cowlin and Son, of Bristol.

SEWAGE DISPOSAL NEAR DONCASTER.—A Local Government Board inquiry was held at Doncaster by Mr. W. O. E. Meade-King, C.E., as to the compulsory purchase of land for sewerage and sewage disposal purposes for Askern, Bawtry, Bentley, Bentley-riding, and Arkeby. The schemes, which have been prepared by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, comprise the main sewerage of the above places, all of which will gravitate to underground storage tanks, from which the sewage will be pumped to the site of disposal works there, to be treated in bacterial tanks, and afterwards on land. Various opponents to the scheme were represented by counsel, who objected chiefly on the ground of cost.

MISCELLANEOUS.

RAILWAY EXTENSIONS, MANCHESTER.—Victoria station, north-west Manchester, is being enlarged by the Lancashire and Yorkshire Railway Company. New platforms for local trains, and a special siding for the fish trade will be provided. In connexion with the improvements, a new bridge has been built by the company to connect Corporation-street with Cheetham Hill-road. The bridge was built by Messrs. Aston, Smith, Sons, & Senior, of Manchester, and is partly a steel-girder bridge, but has a double brick arch, the upper arch being immediately under the roadway, and the lower one forming a roof to a culvert over the river Irk.

DISCOVERY OF A ROMAN PAVEMENT, LEICESTER.—During the excavations now proceeding at the site of the Highcross Coffee House, at the corner of Highcross and High-streets, an excellently-preserved portion of a Roman pavement has been discovered. At the present time only a small portion has been uncovered, but this is being taken great care of, and arrangements are being made to have the surrounding earth carefully removed, so as not to damage the other part of the pavement. It is said that the portion which has been already laid here compares favourably with any other pavement found in Leicester, the cubes being very small, and being set in an artistic pattern with that care and exactness which characterised the best Roman work. What will be done with the discovery is not yet decided, and probably will form the subject of discussion between the directors of the Coffee House Company and the Corporation, but the probability is that the stone work will be removed in as complete a form as possible.—*Leicester Post*.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The usual monthly meeting of the Society of Antiquaries of Scotland was held in their library at the Museum of Queen-street, Edinburgh, on the 11th inst. Sir Thomas Gibson-Carmichael, vice-president, presiding. In the first paper, Mr. Andrew W. Lyons, architect, gave a detailed description of the painted ceiling in the Montgomery aisle of the Old Church at Largs, of which he had presented to the Museum a drawing made to scale in 1897. The roof, which is about 20 ft. by 24 ft., is barrel-vaulted and lined with wood, painted on the under faces of the boards with a most elaborate and beautifully designed and executed series of subjects historical, emblematical, or heraldic, arranged in forty-one compartments, divided from each other by imitation mouldings painted in monochrome. The central panel contains a mantled escutcheon, charged with the quartered armorial bearings of Montgomery and Eglinton, impaled with those of Douglas and Mar, surmounted by a knight's helmet, crest, and motto. Beneath the coat of arms is an oblong cartouche, with the names of Sir Robert Montgomery and Dame Margaret Douglas, and suspended from it a circular tablet with the date 1638. In another compartment are four shields, with the arms of Eglinton, Semple, Drumlanrig, and Lochinvar. Others have emblematical representation of the virtues, the signs of the Zodiac, and the seasons, with landscapes of the surrounding district. One of the larger panels has a representation of the Temptation in the Garden of Eden, and the other has what is believed to be a historical event connected with the Montgomery family, the tragic death of the wife of Sir Robert Montgomery from the kick of a horse in 1624. In the same panel is the signature of the artist, Stalker, of whom nothing is known, and the date 1638. The ceiling, which is most elaborate, well-proportioned, and beautiful in design, may fairly claim to be the best example of the early seventeenth century tempera decorative painting now extant in Scotland. In the next paper Dr. Joseph Anderson gave an account of a remarkable group of brochs in the district of Keiss, Caithness, recently excavated by Sir Francis Tress Barry, Bart., M.P., Keiss Castle.

THE COST OF MUNICIPAL HOUSE BUILDING, SHEFFIELD.—The minutes of the Sheffield Health Committee, submitted at the last meeting of the Sheffield Corporation, contained a report by the City Surveyor that ten of the cottages in Handislane were ready for occupation, and that five more would be ready in a few days. The approximate total cost was stated to be 5,793l. 10s. 3d.—Mr. Turner asked whether the plans had been carried out as passed by the Health Committee, and whether the cost had exceeded the estimate?—Mr. Utley defended Corporation officials who were attacked, and who had no opportunity of denying what was said against them. The cost, as a matter of fact, was slightly under the estimate. Mr. Utley went on to describe the houses, and speaking of the rents (6s. 6d. per week) said if people were to have all the conveniences provided they would have to pay more rent. It was better for a working man to pay 1s. a week more in rent and have an entire yard, and five decently and in comfort, than to pay a low rent and have to mix with other people in the same yard. The people who argued that the houses were too well built did not understand what belonged to good sanitation and property.—Sir Charles Skelton said those who formed committees should exercise the common-sense that they would exercise if they were doing their own business. There was not a member of the Council who would have required twenty-six plans before they decided what they would have in connexion with property of their

the street, but a party wall between the two houses was intact. Previously to the accident Knight had been employed in the work of demolition for five and a-half days, at the rate of 35s. a week. No evidence was tendered at the hearing as to the height of the building at the commencement of his employment.

Mr. Minton-Senhouse, on behalf of the respondents—continued the judgment—contended, in the first place, that No. 17 was not, at the time of the accident, a building within the meaning of the Act, as the part which was in course of demolition, and on which Knight was working, did not exceed 30 ft. in height, and in support of this contention he relied on the case of *Billings v. Ulloay*, 1899, 1 Q.B., 70, where it was held that a building in course of erection, and not exceeding 30 ft. in height, but was intended to exceed that height, was not within the Act. His Honour, however, did not think that the converse necessarily applied, as whatever the height of the building at the time of the accident, a building of the required height was in course of demolition, whilst in the case relied on, the building in question had not, and might never have reached that height. In the present case, moreover, the party wall, which certainly was part of the building, was intact, a fact which, in His Honour's opinion, further distinguished it from *Billings v. Ulloay*, and clearly brought it within the Act.

The case of *Rexivin v. Pritchard*, 1900, 1 Q.B., 800, was also cited, but His Honour did not think that this had any application to the present case.

On behalf of the respondents a further point was taken, namely, that they were not "undertakers" within the meaning of the Act, as the work sub-let by them to Clements was merely auxiliary to the business carried on by the respondents. The learned counsel had referred to *Pearce v. London and South Western Railway Company*, 1900, 2 Q.B., 100, but His Honour could not agree with this contention, as the respondents' agreement with Messrs. Woolland Bros. was both to demolish and to re-construct, and they sub-let the former part of the undertaking to Clements, who thus became a sub-contractor for the execution of the work which, if executed by workmen immediately employed by respondents, would have rendered them liable to pay compensation under the Act to those workmen in respect of any accident arising out of, or in the course of, their employment.

His Honour thought, however, that the respondents were entitled to be indemnified by Clements, as coming within the proviso contained in Section 4 of the Act.

With regard to the amount of the award, in the event of the award being in favour of the applicant, it was contended by Mr. Minton-Senhouse that, having regard to the fact that Knight had only been employed for five and a-half days, his average weekly earnings were not 35s. a week, but only half that sum; in other words, that the 35s. must be spread over two weeks before an average could be struck. His Honour, however, was unable to agree with this contention, and he thought that, according to the provisions in Schedule 1 of the Act, the man's average weekly earnings should be taken at 35s. a week.

His Honour, therefore, assessed the amount of the compensation to be paid by the respondents at 273/, and awarded that sum to the applicant, with costs. The 273/ was to be apportioned as follows: 100/ to be paid to the applicant, and the remaining 173/ to be divided amongst the four children, the money to be deposited in the Post Office Savings Bank by the Registrar, and interest paid to the applicant, with liberty to apply.

The Judge now ordered that the amount of the award should be paid into court within a fortnight, and that if notice of appeal were not given within twenty-one days, the money should be paid out to the applicant.

CONSTRUCTION OF DISTRICT COUNCIL BY-LAW.

AT Brentford Police-court on Monday, Mr. F. W. Smith, of Shirley-gardens, Hanwell, was sued by the District Council for Hanwell for having contravened the by-laws by neglecting to give notice of the completion of Nos. 28 and 30, Shirley-gardens.

Mr. T. A. Woodbridge appeared for the Council and Mr. W. Hook defended.

Mr. Woodbridge said that the proceedings were taken under the 9th By-Law, which required "that every person who shall erect a building shall within reasonable time after completion deliver or send to the Surveyor notice in writing of the completion, and shall within seven days thereafter and at all reasonable times before such building is occupied, allow the Surveyor access for the purposes of inspection. On October 28 the Surveyor, on going to the houses, found them occupied. He also found that the drainage was not completed, inasmuch as it was contrary to the by-laws, there being no separate system for storm-water.

Mr. Sidney Barnes, the surveyor, having borne out this statement in evidence, in cross-examination said that he did not consider the buildings finished, as the sewage was not in order. He admitted receiving on October 16 a letter from defendant to the effect that he was not the builder, but had a contract with the builder, who was responsible. As the builder had not given notice, he would do so

then and there. The drainage was laid two years ago, and the houses remained as carcasses for some time until defendant bought them. He had seen defendant's men at work on the houses, and his foreman lived in one. He had seen the defendant on the land adjoining. He could not swear that two houses were finished in July, but he could not say if anything was done to them after that date.

Mr. Hook submitted that there was no case. The defendant was specifically summoned for not giving notice of completion, but the Surveyor had sworn that the houses were not completed, and until they were there could be no offence, since the notice was not necessary. Assuming, however, the houses were completed, there was no definition of "reasonable time" upon which the Court could act, and it was incumbent that the District Council should show when the completion took place in view of the time limits of the Act. He should show, if necessary, that they were finished in July, and therefore these proceedings were barred by time, the summonses having been issued after six months had expired. The Surveyor, however, admitted having had a notice in October, and though it might have been late, it was given three months before the Council took these proceedings.

The Chairman: But it must be given before the house is occupied.

Mr. Hook denied that that point entered into the case. Nothing was said in the by-laws about notice being given before occupation. He urged as a further point that the defendant was not "the person erecting the building." He was the owner of the land, but he had entrusted the building to a Mr. Hands.

The Chairman: Surely he was the person who erects. He causes the building even if he does not lay the bricks.

Mr. Hook said the words of the by-law must be interpreted strictly. In the criminal law a man could not be shot at through his agent. If that were so a gentleman who instructed a builder to erect a mansion might in absolute ignorance be liable for an offence through an omission of the builder.

The Chairman said the Court were of opinion that the District Council had been to blame for not keeping a better look out on these carcasses. But taking it that they were finished in July, there was unreasonable delay before the giving of the notice to the Court, and for that the defendant was liable. The Court found that having regard to the evidence that the defendant was seen about the buildings and at work next door, that he was in law the person responsible to give the notice, and they also found he was in default in letting the houses before the Surveyor could inspect them. He would be fined 4l. and costs.

Mr. Hook asked for a case, which the Court granted.

BREACHES OF BUILDING BY-LAWS AT HALIFAX.

ON the 12th inst., at the Halifax Borough Court, before Mr. J. T. Riley and other Justices, Wilkinson Pickles, Gads Hill, a member of the Halifax School Board, was summoned by the Halifax Corporation for allowing houses to be tenanted before the same had been certified by the Borough Surveyor as being fit for habitation. Mr. F. M. Tordoff appeared for the prosecution, and stated that the defendant was owner of a block of five houses at Rhondadale, Mile Cross. The Borough Surveyor received notice from the defendant on December 4 that the houses were completed. Two days later an inspector went to the buildings, and as he found them to be defective in certain parts a notice was served upon the defendant on December 8 calling upon him to carry out some requirements, such as channelling, providing fall pipes, &c. Before these alterations were made and before the houses had been certified as "fit" three dwellings became tenanted. The provision of fall pipes had not yet been made. Mr. J. R. Farrar appeared for Mr. Pickles, and stated that he had not intentionally broken the law. He gave orders for the works required to be done, and thought they had been completed. A fine of 5s. and 8s. 6d. costs was imposed.—Harry Aspinall, of Mount Tabor, owner of the Shoulder of Mutton Inn at that place, was summoned on a similar charge. Notice of the completion of the new building was received at the Town Hall on January 2, and when the inspector went to look at the premises he found them occupied. The defendant stated that he was under the impression that his getting leave to build the premises was all he required. A fine of 5s. and 8s. 6d. costs was imposed. The chairman stated that future offenders would be more severely dealt with.

CAB PROPRIETOR AND ARCHITECT.

AT Newcastle County Court recently the case in which Mr. J. C. Parsons, architect, sued Mr. Edwin Gowan, cab proprietor, Heaton, for 37l. 10s., the cost of preparing plans, four years ago, for the erection of a proposed livery stable at Heaton, was concluded.

The defence was that according to an arrangement made there was to be no payment in consequence of the plans having failed to pass the Town Improvement Committee.

His Honour, in giving judgment, said the defendant had put it forward that there was an express undertaking that unless the plans were passed by the Corporation and the work went on plaintiff was to get nothing for the preparation of the plans. He was asked to believe and credit this story because defendant had been bitten once before, and had been compelled to pay for an architect's services without receiving anything in return. It was perfectly true that for about three years no claim was made, and during that time, apparently, attempts were being made to induce the Corporation to pass the plans. But ultimately the account was sent in to defendant, who, for some months took no notice of the letters of Mr. Parsons. Then, on September 9th, 1900, he wrote asking for a detailed account, as it wanted looking into. He (the Judge) could not agree that that was the natural reply for an unprofessional man to make in such a case. The simple reply, one would have supposed, under the circumstances, would have been, "I owe you nothing." Judgment must be given for plaintiff for the amount claimed with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,901.—A CONTRIVANCE FOR WINDOWS: *D. Oldham*.—In order that the sashes may be turned inwards for purposes of ventilation and be readily removed in case of fire, &c., the pivots of the sashes are made to fit within slotted socket-plates secured to the frame; to afford weather-tight joints, rounded beads and grooves are made upon the rails, the lower corners of the sash stiles being cut away so as to clear the outside beams of the frame; sliding bolts fasten the sashes when they are closed, when they are opened they are secured with stay cords or with bolts that will enter into holes cut in quadrant-arms, and to prevent the sashes from becoming detached before they have been turned to an extent already determined they are fitted with stop-blocks which press against curved guides.

20,920-30.—BRICKS AND SIMILAR BUILDING BLOCKS: *G. De Bruyn*.—The brick or block is fashioned in two portions that will interlock with one another, and to render the block non-conducting of heat, a layer of asphalt, asphalt paper, &c., is placed between its two parts. For affording a support or key for plaster the surfaces of the bricks are roughened by the forcing into them, when in a plastic condition, of bits of stone or some such hard substance.

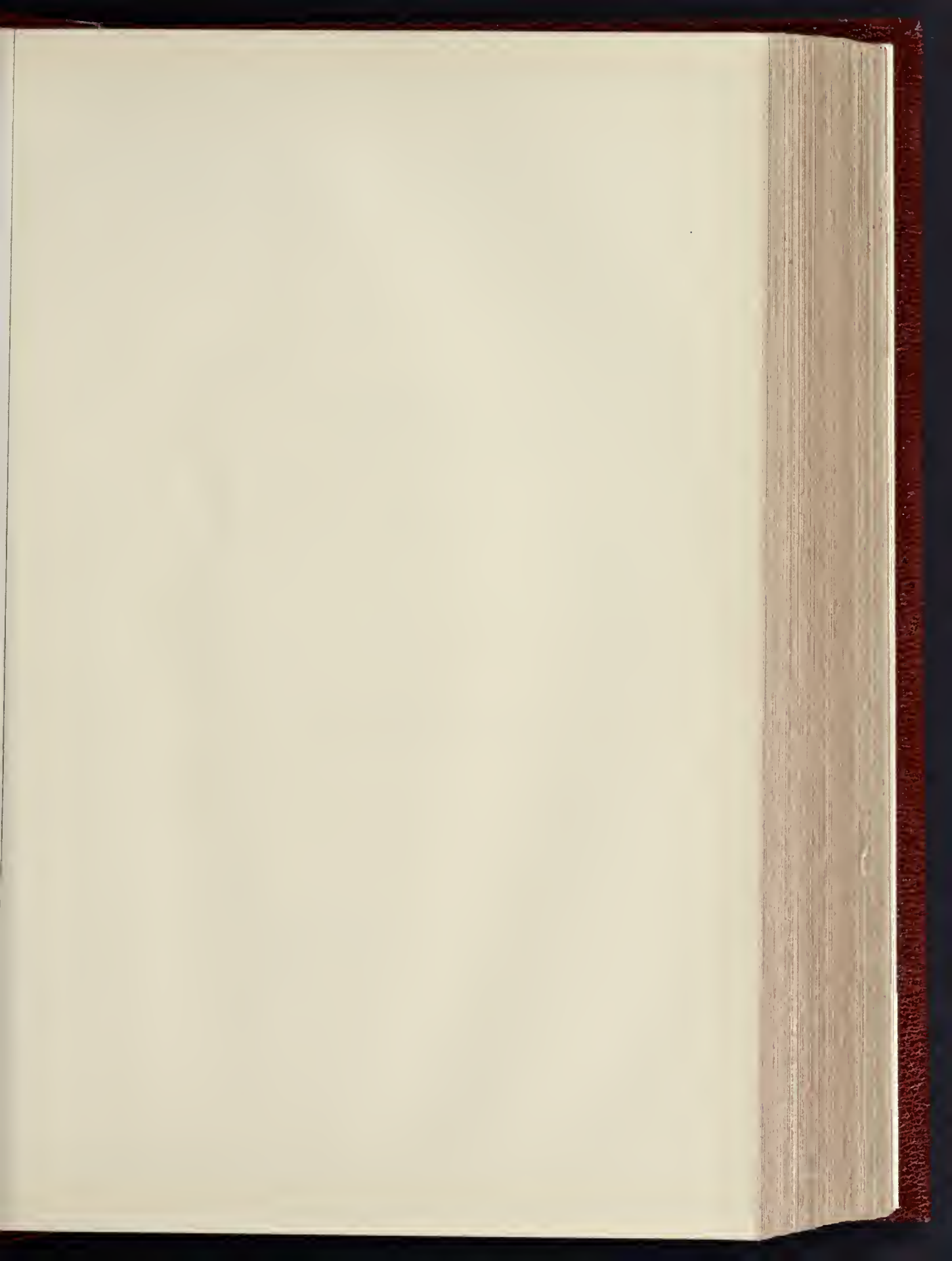
20,936.—A COMPOSITE MATERIAL FOR BUILDERS' USE: *A. Macfarlane*.—A material for slabs, panels, cornices and other ornamental is made by mixing a ceramic setting paste composed of pulverised calcined Mandouli stone, 4 parts; powdered baryta, 4 parts; pulverised baked clay, 2 parts; crushed sandstone, 1 part; and sodium silicate in solution; the moulded articles are hardened at a temperature ranging from 300 deg. to 500 deg. C., their outer surfaces may be fused; for producing perforations, incombustible plugs made of prepared recesses, incombustible plugs made of prepared wood, cork, metal, papier-mâché, and so on are inserted into the paste when it is in the moulds.

20,996.—A MITERING-GUIDE: *A. Macfarlane and A. Jones*.—The inventors seek to facilitate the angular adjustment of the saw-guide; they make it frame and guide, and undercut, plain, or other producing perforations, incombustible plugs made of prepared recesses, incombustible plugs made of prepared wood, cork, metal, papier-mâché, and so on are inserted into the paste when it is in the moulds.

21,086.—GAS BURNERS: *P. Nöel*.—The burner, which is adapted for incandescent heating and lighting, has an air and gas mixing chamber, of which the size can be altered, and air-ornices which can be correspondingly varied with changes in the pressure of the gas; the upper portion comprises a larger mixing chamber and a smaller part in which moves the upper end of a hollow screwed stem in the form of a piston. When the piston is screwed up and down the consequent rise or fall of a sleeve increases or lessens the cross-section of air-inlets, which are made in the stem around the gas-inlet, the stem working in a nut to which the sleeve is attached.

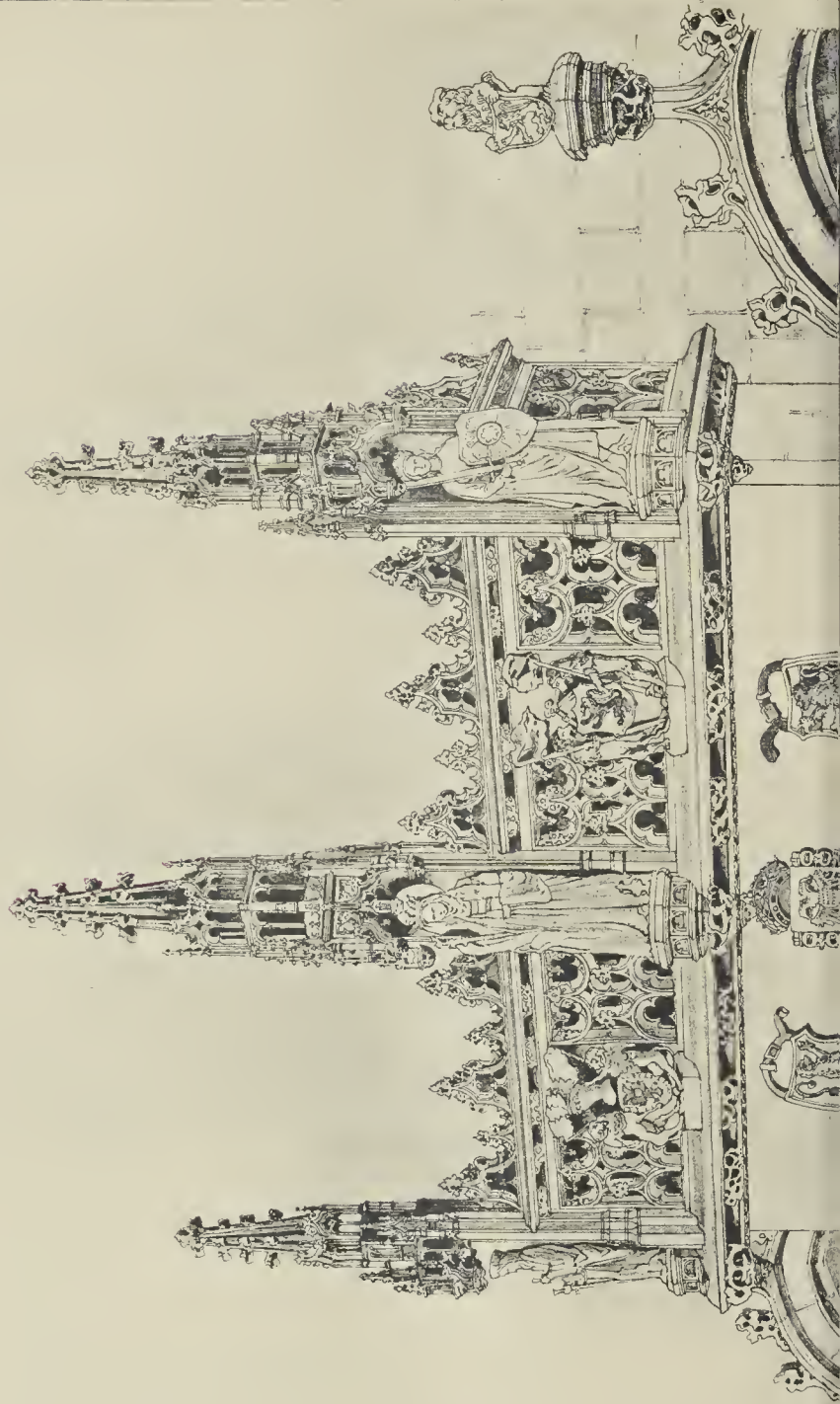
21,130.—GAS BLOWPIPES: *F. Speidel*.—The inventor's object is to afford means of regulating the gas supply together with a pilot igniting jet; a spring piston valve is inserted in the supply branch so as, under normal conditions, to cut off the supply of gas, but gas will flow through an inner pipe to the nozzle of the blowpipe whenever the valve is forced inwards, and a pilot flame which is fed with a small branch pipe will thereupon ignite the jet-screw, to the nozzle; a bent rod, clamped with its end to the valve, is inserted in an opened position, serves to retain the valve in an opened position.

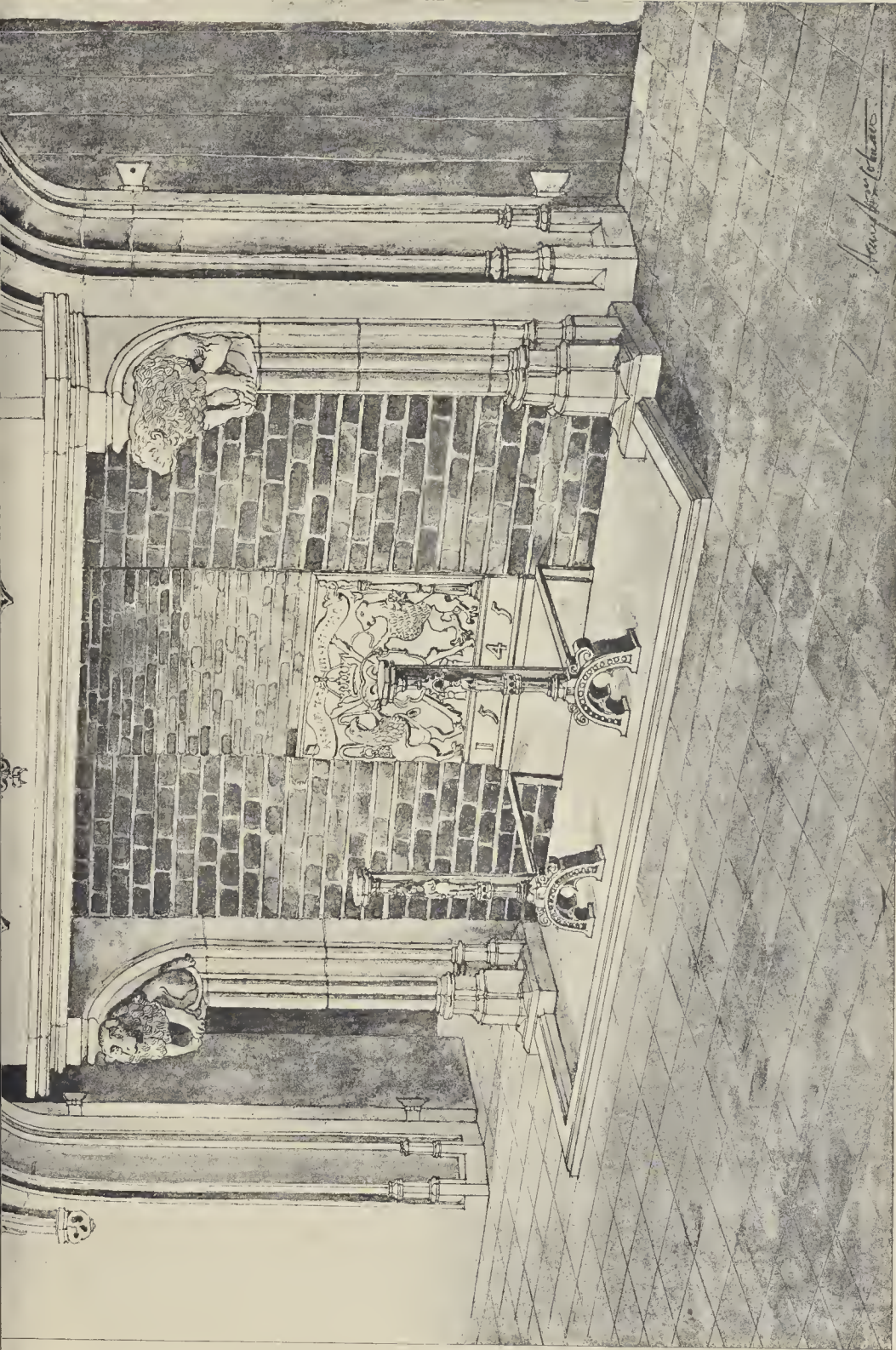
21,173.—MACHINERY FOR CUTTING WOOD: *G. Pickles and A. T. Pickles*.—The invention relates to the balancing of the cranks which are employed to drive reciprocating saws and other similar wood-cutting machines; that result is provided for by the attachment of balancing weights opposite the webs or by fashioning extensions upon the webs themselves.



THE BUILDER, FEBRUARY 23, 1901.

THE TOWER OF THE VIRGIN, AUDENARDE,
NORTH BRUNSWICK





IN PHOTO. SPRAGUE & CO. 4 & 5 LEAST HARDING STREET, PETER LANE, E.C.

(Pugin Studentship, R.I.B.A., 1801.)

21,205.—SPANNERS: F. Kettler.—In order that the stem of the upper jaw shall slide without turning in the lower jaw it is started with an oblong section, its edges also are threaded for engagement with corresponding threads upon the rounded bore of the handle of the tool which is swivelled on to the lower jaw and is pierced with an aperture for the insertion of a lubricant.

21,211.—STONE-SAWING MACHINERY: T. Dawson.—Balance weights are mounted upon extensions, that project above the shaft of the rods from which the frame of the saw is hung. The weights may be carried with a girder-and-bracket arrangement, and further tapered weights can be inserted into recesses which are cut in them.

21,214.—HANDLES FOR FILES AND OTHER TOOLS: L. Grob.—The handle consists of a piece of reed cane, which is wrapped within a casing of paper, or some similar envelope, and is then put into the bored-end of the wooden haft. A hole in the cane takes the tang of the file, &c., and the paper wrapping is wound around and cemented upon the cane. In another shape the haft is shapened out of the paper envelope around the reed cane.

21,220.—A COMPOSITION FOR THE TREATMENT OF WOOD: J. Gibbs.—The compound is devised for use as a filling for the preparation of wooden surfaces that are to be polished. It consists of an admixture of shellac that has been macerated in methylated spirit, ground alum, linseed oil, pumice powder, whitening, and plaster of Paris.

21,230.—COUPLINGS FOR PIPES: C. A. Barclay.—The coupling, which is used more particularly for pipes of soft metal, is formed by means of an internally screw-threaded collar which can be screwed on to a pipe-end, the thread having narrow ridges and a sharpened end in order that it may cut into the softer metal. In a variant form a tapered bore is adapted to the collar, the pipe being expanded when the collar has been screwed on to it.

21,245.—WEIGHING APPARATUS, AND HYDROSTATIC APPARANCES: T. Fern.—The beam from which the platform-carrying rod hangs is suspended from a hand-lever that bears against the frame, and carries another beam upon which is a hook for engagement with the hand-lever. Weights that slide upon the beams are graduated to it, may be stones and cwts. At the ends of the beams are vessels, filled with liquid, and carried by arms to which are attached pointers that will indicate respectively fractions of the units of weight, fixed plungers are disposed above the vessels which may however be arranged above the beams—in that case the hand-lever will not be needed.

21,256.—A FIRE-ESCAPE: F. F. Glaser.—For the lowering of a rope ladder out of a window is devised a frame mounted upon castors, which is supported at its top by a bar that is laid against the sides of the window, in the frame is mounted an axis upon which are pulleys, on to which the sides of the rope ladder are wound; the ladder is passed over guide-pulleys mounted at the end of a hinged frame, which can be folded up when it is not required for use; the descent of the ladder is checked with a brake lever and wheel attached to the axis.

21,260.—WOOD-SCREWS, SCREWED SHANKS OF HOOKS, &c.: J. W. Caldwell.—On the tapered shanks are fashioned highly pitched threads, of which the upper faces are steep and the lower faces are flat and inclined to a degree that will provide for the sharp cutting edge being that part of the thread which shall first enter into the hole of the wood; to obviate the necessity of boring a hole before the screw or hook-shank is put into the wood, the threads are made with sharp wings that project from their ends; the screws can be driven with blows by a hammer.

21,261.—PIPE-WRENCHES: T. E. Ryan.—A separated piece, which is firmly seated upon the end of the shank, and is secured with a pin passed through a socket in the shank and a lug upon the jaw, constitutes the fixed jaw of the wrench. A bar having a set of lugs arranged parallel to the shank and engaging with recesses cut in the shank holds the pin which joins the binged jaw to the shank in any one of a line of notches, and another pin is passed through the shank and the lugs; a pivoted catch holds the other end of the bar.

21,290.—BRICKS FOR VENTILATION: H. W. Roberts.—A contracted overhanging inlet aperture is laid through the brick by forming the brick in two parts, of which the side top and bottom surfaces are sloped. In the inner side of the wall is constructed a recess into which a detachable box of metal is to be inserted. The box has an opening lid a backing plate, which is joined with four rods to the back of the box.

21,303.—A TOP FOR CHIMNEYS: W. S. Shreeve.—The inventor has contrived a chimney-top that presents a tier of cones, two or more in number, and above which the pipe is raised cap, which is unshaped and is inverted; a clamping-ring is used for fastening the lowest open cone of the tier on to plain pipe or chimney-pot.

Royal Institution.—Sir W. Roberts-Austen on "Metals as Fuel" 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. J. L. Criddle on "Automatic Couplings" 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, M.D., on "Duties of a Sanitary Inspector. Offensive Trades and Trade Nuisances." 8 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. G. Dunn on "The Practice of Chimney Building and Boiler Setting." 8 p.m.

Institution of Mechanical Engineers.—Adjourned discussion on Mr. J. Ashford's paper on "Light Lathes and Screw Machines." 8 p.m.

SATURDAY, FEBRUARY 23.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "Sound and Vibration." 1. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Friern Barnet Sewage Works. 3 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Institution of Junior Engineers.—Visit to the Willesden Station of the Metropolitan Electric Supply Company. 2.30 p.m.

Edinburgh Architectural Association.—Visit to Bruntsfield House and St. Oswald's Church.

Dunedin Institute of Architecture.—Visit to General Accident Assurance Buildings, Perth.

MONDAY, FEBRUARY 25.

Royal Institute of British Architects.—(1) Address to Students, by the President, Mr. Wm. Emerson; (2) A Criticism of the Designs and Drawings submitted for the Prizes and Studentships 1900-1901, by Mr. J. Alfred Gotch, F.S.A. (3) Presentation of Prizes. 8 p.m.

Surveyors' Institution.—Mr. Thomas Blashill on "The Present Condition of the Building Industry." 8 p.m.

TUESDAY, FEBRUARY 26.

Institution of Civil Engineers.—Mr. W. H. Stanger and Mr. Bertram Blount on "The Rotatory Process of Cement Manufacture." 8 p.m.

WEDNESDAY, FEBRUARY 27.

Society of Arts.—Dr. W. Schlich, C.I.E., on "The Outlook for the World's Timber Supply." 8 p.m.

City of London College Science Society.—Mr. C. W. Gamble on "Tricolour Photography," with illustrations, &c.

Sanitary Institute (Lectures for Sanitary Inspectors).—Dr. H. R. Kenwood on "Methods of Disinfection." 8 p.m.

St. Paul's Ecclesiastical Society.—A paper entitled "Notes on the Bresses of Kent, Part 1. Ecclesiastical and Military," will be read by Mr. Mill Stephenson, F.S.A. 7.30 p.m.

Institution of Electrical Engineers (Birmingham Local Section).—Inaugural meeting in the University Buildings, Edmund-street. Dr. Oliver Lodge, Chairman of the section, will deliver an inaugural address, and the President of the Institution, Professor John Perry, will be present. 8 p.m.

Institution of Civil Engineers.—Students' visit to the Electrical Works of the London United Tramways, Limited, Chiswick. Assemble at the works, 45, High-road, Chiswick. Train from Westminster Bridge to Putnam Green Station, 1.52 p.m.

Edinburgh Architectural Society.—Mr. W. A. Agnew on "Electric Power in Buildings," illustrated with light-views.

Northern Architectural Association.—Mr. A. P. E. Barker, B.A., on "Legal Topics of Interest to Architects and Surveyors." 7.30 p.m.

THURSDAY, FEBRUARY 28.

Carpenters' Hall, London Wall (Free lectures on matters connected with building).—Mr. H. C. Richards, M.C., M.P., on "Old London." 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. F. H. Evans on "Architectural Details from South-west Münster." 1. Light-views illustrated. 8 p.m.

Royal Institution.—Professor Percy Gardner, F.S.A., on "Greek and Roman Portrait Sculpture." Lantern slides. 1. 3 p.m.

Institution of Electrical Engineers (Inst. of Civil Engineers).—If the discussion on Mr. Madgen's paper is concluded, the following paper will be read: "Cables," by Mr. O'Gorman. 8 p.m.

FRIDAY, MARCH 1.

Architectural Association.—Mr. E. W. M. Wonnacott on "The Paris Exhibition, 1900." 7.30 p.m.

Royal Institution.—Mr. H. H. Cunyngame, C.B., on "Enamels." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Water: Composition, Pollution, and Purification." 8 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Catered Water Gas," by Mr. Samuel Cutler, Jun. 8 p.m.

SATURDAY, MARCH 2.

Royal Institution.—The Right Hon. Lord Rayleigh M.A., on "Sound and Vibrations." 1. 3 p.m.

British Institute of Certified Carpenters (Carpenters' Hall, E.C.).—Mr. W. H. Betambean on "Wood Beams: their Properties and Design." Professor R. Eisey Smith, Vice-President, will take the chair. 6 p.m.

Memorial Hall, Farringdon-street, E.C.—Monthly meeting at 7.30 p.m.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

February 6.—By CHRISTY BROS. (at Ramsey). Ramsey, Isle of Man.—Auckland-lane, a freehold cottage. £130

Tower-st., a block of buildings, offices, stables, &c., f. 600

Andreas, Isle of Man.—A house and shop, and cottages, f. 400

Bride, Isle of Man.—House, workshop, and 2 a.c., f. 285

Ballaugh, Isle of Man.—A freehold field. 3,600

Manghold, Isle of Man.—The Estate of Ballaskeag, 185 a. f. 3,600

By NEWBORN, EDWARDS, & SHILLARD. Holloway.—66 and 68, Langdon-rd., ut. 97 yrs., g.r. 16l. 650

62, Langdon-rd., ut. 69½ yrs., g.r. 6l. 10s. £330

Croydon.—166 and 168, London-rd., ut. 65 yrs., g.r. 10l., r. 80l. 745

Baywater.—17, Fernbridge-rd., ut. 50 yrs., g.r. 7l., r. 55l. 510

By E. SIMPSON.

New Cross.—6, Kittord, ut. 63 yrs., g.r. 6l. 6s., r. 38l. 395

February 8.—By PERKINS & CASAR.

Bermundsey.—226 and 228, Southwark Park-rd., ut. 29 yrs., g.r. 12l. 4s., r. 116l. 1,325

Peckham.—43, Sumner-rd., ut. 63 yrs., g.r. 6l., r. 39l. 470

February 11.—By JENKINS (New Cross).

Brockley.—27, 29, and 35, Sprules-rd., ut. 74 yrs., g.r. 17l. 10s., r. 96l. 995

161 and 163, Brockley-rd., ut. 64½ yrs., g.r. 6l., r. 58l. 720

28 and 54, Endwell-rd., ut. 74 yrs., g.r. 10l. 6d., r. 70l. 680

Deptford.—59, Church-st., f. r. 26l. 315

32 and 34, Watergate-st., f. 385

February 12.—By H. J. BROMLEY.

Forest Hill.—Wastdale-rd., perpetual g.r.'s of 20. 400

Westbourne-rd., i.g.r. 6l., ut. 59½ yrs. 110

8 and 9, Manor-rd., f. r. 125l. 1,410

82, 84, and 86, Devonshire-rd., ut. 63½ yrs., g.r. 18l., r. 95l. 685

13, 14, 15, 16, and 17, Rojack-rd., ut. 52½ yrs., g.r. 14l. 885

By COCKEY & HENDERSON.

Leyton.—149 to 165 (odd), Sidmouth-rd., ut. 79½ yrs., g.r. 27l. 860

Sydenham.—17, Watlington-grove, ut. 65½ yrs., g.r. 3l. 10s. 125

By J. S. RICHARDSON.

Islington.—7 and 9, Mary-st., ut. 26½ yrs., g.r. 8l. 8s., r. 64l. 525

By ROGERS, CHAPMAN, & THOMAS.

Chelsea.—14, Edith-grove, f. r. 85l. 4,000

Brompton.—125, Finborough-rd., ut. 60 yrs., g.r. 9l., r. 55l. 410

By SPEDWICK, SON, & WEALE (at Watford).

Watford, Herts.—Clarendon-rd., Duddenhill, f. r. King's Langley, Herts.—High-rd., a freehold residence. 2,300

High-rd., two freehold houses and cottage, r. 46l. 15s. 760

High-rd., three freehold cottages. 630

By HUMBERT & FLINT (at Watford).

Watford, Herts.—7 and 9, Villiers-rd., f. r. 50l. 690

1 and 3, Clifton-rd., f. r. 625

By BARKER, CATWELL, & FINCH (at Masou's Hall Tavern).

Westminster.—Francis-st., The Windsor Castle p.h., ut. 33½ yrs., r. 150l., with goodwill. 14,150

February 13.—By ANDREWS, HOLLAND, & HITCH.

Chelsea.—31 to 30 (even), King's-rd., and 1 to 10, Caroline-buildings, ut. 5 and 42 yrs., g.r. 34l. 15s. 885

9, Miner-st., ut. 43 yrs., g.r. 9l., r. 50l. 405

2, Rawlings-st., ut. 42 yrs., g.r. 8l., r. 65l. 600

By F. J. BILEY & SONS.

Bermundsey.—165 and 167, St. James-rd., ut. 33 yrs., g.r. 7l. 470

Rotherhithe.—52, 54, and 56, Abbeyfield-rd., ut. 54 yrs., g.r. 12l. 790

By W. A. BLAKESMORE.

Hoxton.—46A, Baring-st., with stabling, workshops, and yard, ut. 3½ yrs., g.r. 4l. 10s., r. 50l. 475

Islington.—125, Graham-st., ut. 36 yrs., g.r. 6l. 10s., r. 30l. 220

East Ham.—9, Forsyth-ter., f. r. 35l. 605

Bermundsey.—297, 299, 301, and 303, Weston-st., ut. 76 yrs., g.r. 30l. 1,825

By FAREBROTHER, ELLIS, & CO.

Regent's Park.—44, 46, and 48, Onaburgh-st., ut. 13½ yrs., g.r. 165l., r. 430l. 1,000

Lambeth.—5 and 6, Bartlett-st., area 1,600 ft., f. 640

By MIDDLETON & CRACKNELL.

Hampstead.—21 and 23, Fleet-rd., ut. 50 yrs., g.r. 13l., r. 84l. 825

February 14.—By BALE & CAPES.

Notting Hill.—54, St. Charles-st., ut. 71½ yrs., g.r. 10l., r. 60l. 525

By G. ERNEST CLARKE.

East Ham.—67, 94, and 96, St. Bernard-st., ut. 96 yrs., g.r. 12l. 12s. 445

By DUNCAN & KININGTON.

Islington.—5, 6, and 7, Ann-st., ut. 26½ yrs., g.r. 12l. 12s., r. 11l. 1,020

Holloway.—3, Ashbrook-rd., ut. 74 yrs., g.r. 4l. 15s., r. 30l. 385

Romford, Essex.—One-fifth share of 38 and 40, Market-place, f. r. 70l. 395

By LOUND & HOWITT.

Clapton.—28 and 30, Elderfield-rd., f. r. 58l. 950

Camden Town.—James-st., i.g.r. 170l., ut. 20 yrs., g.r. 100l. 750

By C. C. & T. MOORE.

Leytonstone.—High Stone, Forest Lea, f. r. 80l. 1,620

Mile End.—53 to 61 (odd), Cephas-st., ut. 29 yrs., g.r. 15l., f. 170l. 1,565

February 15.—By MESSRS. COUB.

Cranbrook, Kent.—The Bull Hotel, area 14,050 ft., f. 2,900

By G. HEAD & CO.

Paddington.—43, Westbourne Park-cres., ut. 59½ yrs., g.r. 8l., r. 45l. 400

Manor Park.—325, Romford-rd., f. r. 70l. 1,025

By A. A. HOLLINGSWORTH.

Dalston.—2, Kitson-rd., ut. 50½ yrs., g.r. 5l., r. 25l. 385

Bow.—Old Ford-rd., i.g.r. 5l. 50l., reversion in 5½ yrs. 540

By VENTON, BULL, & COOPER.

Camberwell.—21, Benhill-rd., ut. 71½ yrs., g.r. 6l. 6s. 375

Contractions used in these lists.—F.g.r. for freehold ground-rent; i.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for annuity; f. for fee; s. for copyhold; l. for leasehold; e.r. for estimated rental; ut. for unexpired term; p.a. for per annum; y. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

MEETINGS.

FRIDAY, FEBRUARY 23.

Architectural Association Discussion Section.—Mr. F. Osborne Smith on "Domestic Heating, Ventilation, and Lighting." 7 p.m.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Desigus to be delivered
Public Library	Keighley Corporation	50l., 80l. and 20l.	April 30

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Public Conveniences, &c., Marine-parade	Weston-super-Mare U.D.C.	H. Nettleton, Surveyor, Town Hall, Weston-super-Mare	Feb. 26
Extension of Water Main	Ipswich Burial Board	Clerk, Board's Offices, Ipswich	do.
Fireclay Retorts, Firebricks, &c.	Barrow-in-Furness Corporation	Manager, Gas Offices, Town Hall	do.
Granite Road Metal (2,000 tons)	Exmouth U.D.C.	W. D. Harding, Surveyor, Exmouth	do.
Road Widening	Willenden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	Feb. 27
*Works and Materials	Hampstead Borough Council	Borough Surveyor, Town Hall, Haverstock Hill, N.W.	do.
Office Buildings, Bamford, Sheffield	Derwent Valley Water Board	T. G. Taylor, Borough Surveyor, Albion House, Ramsgate	do.
Enclosing Destructor Buildings, Whitehall Field	Ramsgate Corporation	Borough Engineer, Council's Offices, Macey road, Plumstead	Feb. 28
*Making-up Roads	Yeovil (Somerset) Corporation	W. K. L. Armitage, Surveyor, Municipal Offices, Yeovil	do.
Septic Tanks, Filters, &c.	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Railings and Fixing, Armlay Park	do.	do.	do.
Boundary Wall, Armlay Park	Yorkshire Banking Company	Bedford & Kitson, Architects, Greek-street Chambers, Leeds	do.
Banking Premises, Middlesbrough	Shepton Mallet Guardians	W. Phelps, Civil Engineer, Council Offices, Shepton Mallet	do.
Drainage Works	Hackney Borough Council	Borough Engineer, Town Hall, Hackney	do.
*Works and Materials	Whittington U.D.C.	A. H. Mountbain, Civil Engineer, Town Hall, Whittington	Mar. 1
Street Works, Vickier-grove, &c.	Swansea Corporation	G. Bell, Borough Surveyor, 13, Somerset-place, Swansea	do.
Heating and Ventilating Works at Guildhall	Lowestoft Town Council	O. M. Hanby, Civil Engineer, Town Hall, Lowestoft	Mar. 2
Timber Protection Wall (1,750 yards)	Romsey (Hants) Guardians	J. Allison, The Abbey, Romsey	do.
Tanks, Pipes, &c., at Workhouse	Farnham U.D.C.	P. Watson, Architect, 4, Adam-street, Adelphi, W.C.	Mar. 4
Offices, Fire Station, &c., South-street	do.	Rev. G. Jones, Brynafel, Treconon, Aberdare	do.
Additions to Chapel, Aberdare	Trevelthyn School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
School, Pontnewydd, near Pontypool	Paddington Borough Council	Surveyor's Department, Town Hall, Paddington	Mar. 5
*Underground Conveyance	Leyton U.D.C.	Surveyor, Town Hall, Leyton	do.
*Granite	Kent County Council	Council House, East Hill, Wandsworth	do.
*Making-up Roads	Tottenham U.D.C.	County Surveyor, 80, Week-street, Maitstone	do.
*Maintenance and Repair of Main Roads	Middlesex County Council	Engineer, 712, High-road, Tottenham	do.
*Wood Paving	do.	H. T. Wakeman, Guildhall, Westminster	do.
*Broken Granite	Fulham Borough Council	Borough Surveyor, Town Hall, Walham Green, S.W.	Mar. 6
*Ornery Granite	Worley R.D.C.	G. E. Beaumont, Civil Engineer, Grenoside, near Sheffield	do.
*Boundary Wall	Manchester Corporation	C. Nickson, Town Hall, Manchester	Mar. 7
Pipe Sewers, &c., near Sheffield	South Stoneham R.D.C.	F. Wentworth-Shells, 1, Cranbury-road, Southampton	do.
Hydraulic Lift	Beckenham U.D.C.	Council Offices, Beckenham, Kent	Mar. 11
Rectory Buildings, Downpatrick	Bristol Electrical Committee	Secretary, Electricity Department, Temple Back, Bristol	Mar. 12
*Sewerage Works	Hareford & Worcester Agric. Soc.	J. A. McConnel, Vestry Office, Downpatrick	Mar. 13
*Substructure of Avonbank Electricity Works	Rugeley (Staffs) U.D.C.	F. Pritchard & Co., Engineers, 37, Waterloo-street, Birmingham	Mar. 16
Showyard Buildings, &c., Evesham	Edinonton School Board	See Advertisement	Mar. 19
Sewerage Works	Derbyshire County Council	J. Somes Storey, Surveyor, County Offices, Derby	Mar. 20
School at Ryeplam-road, near Ilkerton	do.	W. Carmichael, Architect, Parton, Whitehaven	No date
Widening Gallows Inn Bridge, near Ilkerton	do.	British Electric Transformer Manufac. Co., Ltd., Woodfield-rd., W	do.
Pipe Sewer at New Eltham	do.	Brooks & Pickup, Pont-fract-lane, Leeds	do.
Streets, Sewers, &c., Biggiss, Cumberland	do.	A. W. Start, Architect, Colchester	do.
Streets, Sewers, &c., near Sheffield	do.	J. M. Fawcett & Son, Architects, 26, Albion-street, Leeds	do.
Colliery Workshop, Leeds	do.	Mr. Morrison, St. Helens Colliery, Siddick, near Workington	do.
Restaurant and Hotel, Dovercourt, Essex	do.	T. A. Wellford, Eastington School Board, Sealing, Latus, R.S.O.	do.
House, Sherrburn-in-Elmet, Yorks	do.	A. F. Newsum, Architect, Albert-road, Middlesbrough	do.
Sinking two Shafts, Sulistock, near Workington	do.	Radclyffe & Co., 78, King-street, Manchester	do.
School, Sealing, Eastington, Durham	do.	R. Maxwell, Surveyor, Lea-road, Gainsborough	do.
Villas, Phillipsville Estate, Middlesbrough	do.		
Drainage Works, Dearnley	do.		
Granite Road Metal (10,000 tons)	do.		

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Assistant Sewer Surveyor	Birkenhead Corporation	110l. per annum	Feb. 27
Surveyor, &c.	Northalerton U.D.C.	110l. per annum	do.
*Clerk of Works	Brentford Union	4l. 4s. per week	Feb. 28
*Architectural Draughtsman	Bury Trauways Committee	120l. per annum	do.
Sanitary Inspector	Swindon Corporation	3l. 3s. per week	Mar. 1
*Clerk of Works	Fyde, Preston, &c. Hospital Com.	125l. per annum	No date
*Assistant Lecturer	Portsmouth Technical Institute		

Those marked with an asterisk (*) are advertised in this Number. Competitions, pp. iv, vi, viii, x, & xxi. Public Appointments, pp. xviii, & xxi.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

	BRICKS, &c.
	£ s. d.
Hard Stocks	1 15 0 per 1,000 alongside, in river
Rough Stocks and Grizzles	1 12 0 " " " "
Smooth Bright Facing Stocks	2 18 0 " " " "
Shippers	2 8 0 " " " "
Flettons	1 9 0 " " " "
Red Wire Cans	1 15 6 " " " "
Best Farnham Red	3 11 6 " " " "
Best Red pressed Rushton Facing	5 5 0 " " " "
Best Blue Pressed Staffordshire	4 7 0 " " " "
Do., Bullnose	4 12 0 " " " "
Best Stourbridge Fire Bricks	4 4 6 " " " "

PRICES CURRENT (Continued).

BRICKS, &c.	£ s. d.
GLAZED BRICKS.	
Best White and Ivory Glazed	
Stretchers	13 0 0 per 1,000 alongside in river.
Quoins, Ballnose, and Flats	17 0 0 " " " "
Double Stretchers	19 0 0 " " " "
Double Headers	19 0 0 " " " "
One Side and two Ends	19 0 0 " " " "
Two Sides and one End	20 0 0 " " " "
Splays, Chamfered, Squints	20 0 0 " " " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0 " " " "
Quoins, Bullnose, and Flats	14 0 0 " " " "

PRICES CURRENT (Continued).

BRICKS, &c.	£ s. d.
Double Stretchers	15 0 0 per 1,000 alongside in river
One Side and two Ends	15 0 0 " " " "
Two Sides and one End	15 0 0 " " " "
Splays, Chamfered, Squints	14 0 0 " " " "
Seconds Quality White and Dipped Salt Glazed	2 0 0 " " " "
Thames and Pit Sand	7 6 per yard, delivered
Thames Ballast	3 0 per ton
Best Portland Cement	38 0 per ton
Best Ground Blue Lias Lime	25 6 " "
NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.	
Grey Stone Lime	13s. 6d. per yard, delivered
Stourbridge Fire-clay in sacks	12s. 6d. per ton at ry, dp

PRICES CURRENT (Continued).

Table listing prices for stone materials including Ancaster in blocks, Bath, and various sizes of slabs and blocks.

SLATES.

Table listing prices for slates such as blue Bangor, Portland, and various sizes of roofing tiles.

TILES.

Table listing prices for various types of tiles including plain red, hip, and valley tiles.

WOOD.

Table listing prices for building wood, including yellow deal, various sizes of battens, and other timber products.

JOINERS' WOOD.

Table listing prices for joiners' wood, including yellow deal, white deal, and various sizes of battens.

REGULAR SIZES.

Table listing prices for regular sizes of various materials, including copal varnish and other finishing products.

PRICES CURRENT (Continued).

Table listing prices for wood materials including Dry Walnut, Teak, and American Whitewood Planks.

JOISTS, GIRDERS, &c.

Table listing prices for joists, girders, and other structural steel components.

METALS.

Table listing prices for various metals including iron, steel, and galvanized sheets.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English sheet glass in various sizes and thicknesses.

OILS, &c.

Table listing prices for various oils including linseed oil, turpentine, and other industrial liquids.

VARNISHES, &c.

Table listing prices for various types of varnishes and finishing products.

TO CORRESPONDENTS.

CLERK OF WORKS (No space this week).—F.R.I.E.A. (We cannot publish letters which are sent without the name and address of the writer enclosed).—M. & F. (Amounts should have been stated). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any communication to a contributor to write an article is given subject to the approval of the editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £500, unless in some exceptional cases and for special reasons.]

BURGESS HILL (Sussex).—For the erection of an isolation hospital, for the Cuckfield Urban District Council. Mr. J. T. Hine, architect, 35, Parliament-street, Westminster, S.W. J. Brown, £12,100; Rowland Bros., £12,279; Ockenden & Son, £11,802; Pater Bros., £10,000; Thomas & Edge, £11,577; R. Tonge, £9,898; Langley & Sons, £10,949; S. Knight, £9,802; Johnson & Co., £10,377; W. Wallis, £9,741; Peart, Dennis & Co., £9,730; Field & Co., £9,570; Foster Bros., £10,263; Norman & Burt, Burgess Hill*, £9,399; Cook & Son, £10,284.

CHIPPENHAM.—For new house at Hardenbush, for Captain M. Allfrey. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Wesson, Parliament Mansions, Victoria-street, S.W. Hayward & Wooster, £59,127; R. Kudman, Chippenham, £8,594; ham, £8,377.

DURHAM.—For the construction of 1,720 lineal yards of 9-in. pipe sewers, with manholes, ventilation shafts, flushing chamber, screening chamber, and the laying-out and fencing of 3 acres of land for sewage irrigation at Aldin Grange, in the parish of Broom, for the Durham Rural District Council. Mr. George Gregson, Surveyor to the Council, 35, Sadler-street, Durham. G. T. Manners, £1,776 0 0; J. G. Bradley, £1,496 19 6; P. Frater, £1,666 0 0; John Carrick, Robert Oliver, £1,550 0 0; W. Barnham, £1,493 1 3; Thos. Skelton, £1,544 7 11; Wm. Garnett, £1,553 5 0. [Surveyor's estimate, £1,564.]

GLASGOW.—For the erection of a hospital, Stobhill, Springburn (first section), for the Parish Council. Messrs. Thomson & Sandilands, architects, 241, West George-street, Glasgow. Masonry and Brickwork.—J. J. & P. M'Lachlan, Larbert*. £72,089 0 0. Joinery.—Duncan Buchanan, London-road, Glasgow*. 23,705 15 1.

LONDON.—For new electricity station, Whiston-street, Haggerston, for the Metropolitan Borough of Shoreditch. Messrs. Kincaid, Waller, & Manville, engineers. Quantities by Mr. John Rider Hunt, Bridge House, 181, Queen-Victoria-street, E.C. A. E. Symes, £50,200 0 0; Harris & G. E. Todd, £19,919 0 0; Wardrop, £17,630 0 0; Foster Bros., £19,735 0 0; C. Gray Hill, £17,550 0 0; Dolman & Co., £18,950 0 0; Chessum & Co., £18,349 0 0; Sons, £17,438 0 0; Wallace & Co., £17,562 16 11; Sons, £17,299 0 0; Clift Ford, £17,941 0 0; Johnson & Wall & Co., £17,742 0 0; Sons, Leicester*, £16,633 0 0.

LONDON.—For the erection of The Perseverance, East Ham, for Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied:—F. & T. Thorne, £4,350; Courtney & Fairbairn, £4,053; Peck & Co., £4,270; Sheffield Bros., £3,925; Dearing & Son, £4,205.

LONDON.—For the erection of the Lutheran Schools, Antill-road, Tottenham, N. Mr. Augustine Caudé Green, architect, 40, Bruce Castle-road, Tottenham, N. J. Porter, £2,845 0 0; P. Hart, £2,719 10 0; J. Groves, £795 0 0; Green & Boxall, £717 14 0; J. Stewart, £785 0 0; William Easton, £755 0 0; T. Giles, £735 0 0; Leighton-road, £723 0 0; Knitish Town, N.W., £560 0 0.

WELLINGTON.—For business premises, Wellington, for Mr. H. Shepard, Messrs. Dalgleish & Dickens-Lewis, architects. Quantities by the architects:—R. & J. Millington, £1,950; Price & Sons, £1,880; John Carver, £1,858; A. Roper, Wellington, £1,798.

[See also next page.]

CROYDON (South).—For alterations and additions to the Surrey Drivers' Hotel, Selton-road, for Mr. A. G. Towler. Mr. D. Carmichael, architect, London:—
 Whitehead & Bullied & Son £1,497 0 0
 Co. £2,065 0 0 Umlandt & Nicholl, 3,440 0 0
 Smith & Sons 1,937 0 0 Worsfold & Truett & Steel 1,634 0 0 Sons, Croydon* 1,320 0 0
 (No quantities supplied.)

WHITLEY.—For alterations to Whitley Brow, for Mr. A. Murray Shirreff. Mr. Harold Brakspear, F.S.A., architect, Corsham:—
 H. Hoskings £730 Bigwood & Co., R. Rudman 687 Melksham* £624

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

* Recommended for acceptance.

ANERLEY COTTAGE HOME FOR THE DEAF.—Accommodation, 30 boys and 30 girls; total, 60. Consisting of two blocks of semi-detached cottages, each cottage comprising:—

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Central Block.—School building.

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F. & H. F. Higgs	21,499	Smith & Sons, Ltd.	19,916
Kirk & Randall	21,374	J. & C. Bowyer	19,695
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T. Cruwys .. 137 0 0	11 19 0	135 0 0	
General Builders, Ltd. 149 0 0	—	—	
Hammer & Co. Ltd. 125 0 0	10 10* 75 0 0	93 0 0	
London School Furniture Co. 100 0 0*	12 10 65 0 0*	85 0 0*	

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ILLUSTRATIONS.

Part of a Tapestry Panel: "Adoration of the Infant Christ" (Owen Jones Prize, R.I.B.A., 1901).—From a drawing by Mr. Hervey Rutherford *Double-Page Ink-Photo.*
 Design for Façade of a Military Museum.—By Mr. J. E. Spain *Double-Page Ink-Photo.*
 Leamington Free Library and Technical Schools: Premiated Design.—Mr. J. F. Newbery, Architect *Double-Page Ink-Photo.*
 House, Woodbourne-road, Edgbaston.—Messrs. Bateman & Bateman, Architects *Single-Page Ink-Photo.*
 The Cable House, Kingshead.—Messrs. Bateman & Bateman, Architects *Single-Page Ink-Photo.*

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The Strength of Timber.



One who has examined a series of tests of timber, or who has compared the tests carried out on any variety of timber by different experimentalists, can have failed to be struck by the wide divergence in the strength of many of the specimens. It is this divergence which has rendered all attempts to ascertain the normal strength of timber more or less unsuccessful. The important investigations instituted by the U.S.A. Department of Agriculture (Forestry Division) have added much to our knowledge of the subject; but, unfortunately, they were abandoned while still incomplete. Nevertheless the published records of these investigations furnish the most trustworthy information which has yet been obtained, and as they are not so well known in this country as they deserve to be, they will be largely quoted in this article.

It has long been known that "green" timber is weaker than seasoned. Sixty years ago Hodgkinson made a few tests for the purpose of ascertaining the difference of crushing strength, but his experiments were not carried out with sufficient accuracy, nor on a sufficient number of specimens, to render the results of much use. The degree of moisture in the original specimens does not appear to have been ascertained, but we are told that they were "moderately dry," and that the specimens in the second series had been kept two months longer in a warm place. Baywood, mahogany, and pitch-pine showed no increase of strength; Alder, ash, cedar, and white deal very little increase; while other woods showed increases varying up to more than 100 per cent.

Bauschinger's tests are more satisfactory, and go to prove that "green" pine timber may have less than half the compressive

strength of dry, but that the difference is not so great for transverse stresses. The results of his compressive tests on Scotch pine (*i.e.*, red or yellow deal) are particularly instructive. Four pieces of timber were taken, and sections from these were cut and tested "green"; these contained on the average 59 per cent. of moisture calculated on the *dry* weight of the wood, or 37 per cent. calculated on the *wet* weight, and had a crushing strength of about 4,400 lbs. per square inch. Four tests were afterwards made on partly-seasoned sections, containing moisture equal to 17 per cent. of the *dry* weight, or 14.6 per cent. of the *wet* weight, the average crushing strength being 6,500 lbs. per square inch. Finally, four tests were made on thoroughly-seasoned sections, which contained 9 per cent. of moisture on the *dry* weight, or 8.2 per cent. on the *wet* weight; these had an average strength of 10,700 lbs. per square inch. In other words, the partly-seasoned wood was about half as strong again, and the thoroughly-seasoned wood about two-and-a-third times as strong, as the green wood.

The experiments carried out by Professor J. B. Johnson and Mr. Roth for the U.S.A. Division of Forestry are particularly valuable, on account of the number of tests which were made and the care with which the investigations were conducted. The tests of the four "Southern pines" will be briefly considered. These are the Cuban pine (*Pinus cubensis*), the Longleaf pine (*Pinus palustris*), the Shortleaf pine (*Pinus taeda*), and the Loblolly pine (*Pinus echinata*). These are known by a great many local names, but, speaking broadly, it may be said that they are classed as "yellow" pine in America, and as "pitch" pine in this country. The ratios of transverse and compressive strength are given in Table I. for four different degrees of moisture—namely, 33 per cent. ("green" timber), 20 per cent. ("half-dry"), 15 per cent. ("yard-dry"), and 10 per cent. ("room-dry"). On the average the strength of the timber is increased

46 per cent. by "ordinary good yard-seasoning," and 82 per cent. by "thorough seasoning in kiln or house." With regard to these tests, Mr. B. E. Fernow, Chief of the Division of Forestry, states that "large timbers require several years before even the yard-season condition is attained, but 2 in. and lighter material is generally not used with more than 15 per cent moisture."

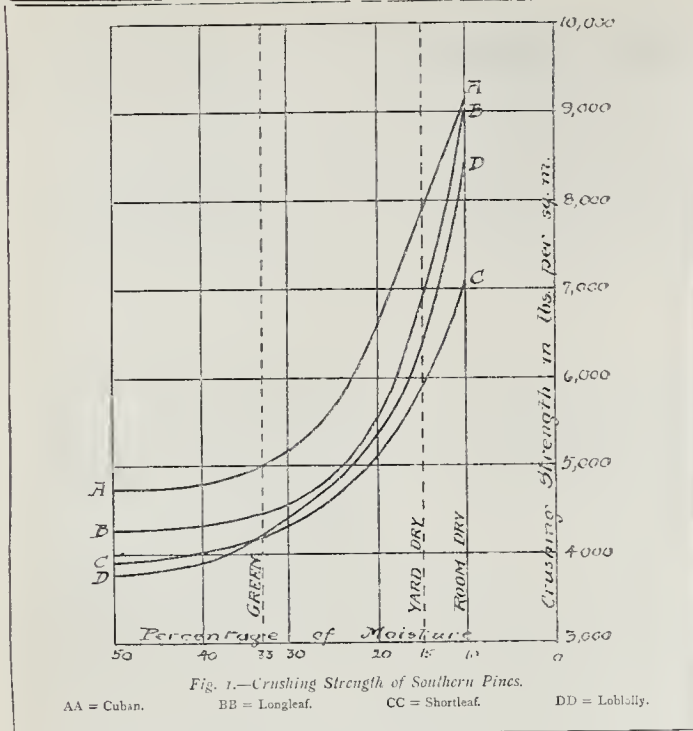
TABLE I.

Influence of Moisture on Strength of Southern Pines.

Nature of Stress.	Percentage of moisture calculated on "dry" weight.	Relative Strength.				
		Cuban.	Longleaf.	Loblolly.	Shortleaf.	Average.
Bending.....	33	100	100	100	100	100
	20	118	116	117	118	117
	15	142	142	138	134	139
	10	181	182	168	160	173
Crushing endwise.....	33	100	100	100	100	100
	20	132	122	128	122	126
	15	157	154	156	142	152
	10	184	205	206	168	191
Mean of both bending and crushing.....	33	100	100	100	100	100
	20	125	119	122	120	122
	15	149	148	147	138	146
	10	182	194	187	164	182

The actual compressive strength in lbs. per square inch is shown graphically in fig. 1, and varies on the average from about 4,200 lbs. to 8,100 lbs. per square inch, according to the degree of moisture. The illustration is reproduced with slight alterations from one in Circular No. 12, United States Department of Agriculture (Division of Forestry), from which also the other particulars of the tests have been obtained.

The importance of moisture as a factor in the strength of timber can scarcely be over-estimated. The results already recorded show clearly that little reliance can be placed on tests of timber, unless the amount of moisture has been carefully ascertained. The failure to determine this factor is one cause of the great discrepancy between the ultimate strengths recorded by different investigations. It also accounts in a great measure for the difference of strength



observed between small test-pieces and large scantlings of the same timber. To be strictly comparable, all tests should be reduced to a common standard of moisture (say, 15 per cent.), and, until this is done, the investigation into the strength of timber will make little progress.

The specific gravity or weight of dry timber is another important factor of strength. It has long been known that, of timber of the same species, the heavier is generally the stronger, and recent experiments appear to indicate that this truth is of wider application. If this should prove to be the case, the subject of timber physics will be vastly simplified. Bauschinger's tests of pine, larch, spruce, and fir led him to the conclusion that the crushing strength of these timbers increases almost directly as the specific gravity, or, more exactly—

$$\text{Crushing strength in lbs. per square inch} = (13,800 \times \text{s.g.}) - 900.$$

American tests of "green" cypress, whose specific gravity varied from .58 to .35, showed a gradual diminution of strength from 6,500 lbs. to 2,900 lbs. per square inch under compression, and from 7,800 lbs. to 5,000 lbs. per square inch under a transverse stress.

The specific gravity or weight of the four Southern pines already described is a very accurate index of their transverse and compressive strength, but apparently the relationship between the specific gravity or weight and the tensile and shearing strength is not so intimate, at any rate as regards Cuban pine. We need not particularise these tests, but will briefly indicate the results obtained from a series of specimens specially tested for transverse strength and specific gravity. Taking the value of Cuban pine at 100 both for strength and specific gravity, we have, for Longleaf pine, strength = 91, s.g. = 94; for Loblolly pine,

strength = 84, s.g. = 82; and for Shortleaf pine, strength = 77, and s.g. = 77. The relationship is remarkably exact throughout.

To ascertain the specific gravity of wood special apparatus is required, but a close approximation is in many cases possible by simple inspection or measurement. The greater the relative proportion of the dark summer-wood rings the greater will be (other things being equal) the specific gravity and the strength. Thus, among the southern pines, the dark rings have in good timber a specific gravity varying from .9 to 1, while the light-coloured spring-wood rings have a specific gravity of about .4 only. A log, therefore, in which the dark rings are one-third of the whole will have a specific gravity of .56, calculated thus:—

$$\left(\frac{1}{3} \times 9\right) + \left(\frac{2}{3} \times 4\right) = .56.$$

In the words of Mr. Fernow, "the relative amount of summer wood furnishes altogether the most delicate and accurate measure of these differences of weight as well as strength . . . especially since this relation is free from the disturbing influence of both resin and moisture contents of the wood, so conspicuous in weight determinations."

It follows from the facts just recorded that slowly-grown timber, with narrow annual rings, is not necessarily stronger than quickly-grown timber. The question is not so much one of the width of the annual rings as of the proportion between the light and dark parts of the rings; that is to say, between the spring wood and summer wood. As we shall see hereafter, the age of the tree has also a considerable influence on the strength of the wood.

While it is satisfactory to know that, other things being equal, the transverse and crushing strength of timber of the same species varies almost directly as the specific

gravity, a still more important point for determination is whether the relationship between specific gravity and strength holds good for timbers of different species and genera. The results of tests of thirty-two different American woods, including pines, cedars, ash, oaks, hickories, &c., show clearly that there is an intimate relation between the two, but that assumption of the U.S. Division of Forestry—that the strength varies directly as the weight—does not appear to us to be borne out by the facts. If the transverse tests are plotted graphically, the theoretical line of strength, according to this assumption, will be a straight line, and this will divide the tests into two unequal groups, eight species being on one side of the theoretical line of strength, and twenty-four on the other. The following original formula, devised by the writer, gives a curved line of strength, which divides the woods into two equal groups, sixteen on each side of the line, and therefore accords much more closely with the tests:—

$$W = 5000 + 38 w^2,$$

where W = ultimate transverse strength in lbs. per square inch, and w = weight of a cubic foot of "dry" wood in lbs.

It must not be forgotten, however, that, in the words of the Report, "these tests and weight determinations (especially the latter) were not carried on with that fineness which would be required for a scientific demonstration of a natural law," and that cross-grain, knots, moisture, and other conditions, may have affected the results in some cases more than others. The conclusions of the Division of Forestry are thus cautiously stated in circular No. 15:—"We can now extend the application of the law of relation between weight and strength a step farther, and state as an indication of our tests that probably, in woods of uniform structure, strength increases with specific weight, independently of species and genus distinction, i.e., other things being equal, the heavier wood is the stronger. We are at present inclined to state this important result with caution, only as a probability or indication."

We have seen that seasoned timber is much stronger than green, but the method of seasoning deserves consideration, as it may have considerable influence on the ultimate strength. Many experts are of opinion that natural seasoning gives the best results, but the time required is so long that more rapid methods are now indispensable. Drying in kilns is the process most generally adopted, and, if due care is exercised, appears to be perfectly satisfactory; on the other hand, if carried on too quickly, it may prove injurious, especially to hardwoods of complicated structure (such as oak), in which it produces a great amount of checking or cracking. Cuban pine in small scantlings (4 in. by 4 in.) has been found to have the same transverse and compressive strength when seasoned in warm air (about 100 deg. Fahr.), and when dried at temperatures varying from 150 deg. at the entrance of the kiln to 190 deg. at the exit. Higher temperatures, however, appear to be injurious. Scantlings of Longleaf pine, tested after drying at a temperature of over 300 deg. Fahr. and under a pressure of 150 lbs., were found to have the compressive strength reduced about 24 per cent. and the transverse strength no less than 37 per cent.

The soaking of wood by rafting or floating does not appear to have any injurious effect on the strength, provided that the wood is properly dried or seasoned before use.

The nature of the soil and climate has some effect on the strength of timber, but this effect is much more marked in some varieties than in others. Thus, Cuban and Longleaf pines appear to be very little affected by the locality in which they are grown, but the same cannot be said of other yellow pines. In the case of cypress, also, the difference in strength appears to be rather "a matter of individual variation than of soil or climate." Bauschinger found a marked difference in the compressive strength of whitewood or spruce from different localities, as shown in Table II.

TABLE II. (AFTER LANZA)

Bauschinger's Tests of Compressive Strength of Red Deal (*Pinus Silvestris*) and Whitewood (*Picea Excelsa*).

Time of Felling.	Red Deal from Lichtenhof.		Whitewood from					
			Frankenhöhe.		Regenhöhe.		Schliersee.	
	1 lbs. per sq. in.	2 lbs. per sq. in.	1 lbs. per sq. in.	2 lbs. per sq. in.	1 lbs. per sq. in.	2 lbs. per sq. in.	1 lbs. per sq. in.	2 lbs. per sq. in.
Summer....	6,244	7,183	4,592	6,416	5,379	6,287	3,143	4,579
Winter.....	6,784	6,343	5,618	6,756	5,348	6,343	4,233	4,779

which is also interesting for the light it sheds on the influence which the date of felling has on the strength of timber. The tests three months after felling (columns No. 1) show that the winter-felled wood is much stronger than summer-felled, but this advantage is lost with thorough seasoning, as it is merely due to the fact that in winter there is less moisture in the wood than in summer. The tests of the seasoned wood (column No. 2) may be conveniently compared by averaging them, when (1) tested three months after felling; (2) tested five years after felling, it will be found that the average strength of the summer-felled timber is 6,114 lbs. per square inch, and of the winter-felled, 6,055. It may therefore be stated that the time of felling has no permanent influence on the strength of timber, but that summer-felled wood requires longer seasoning than winter-felled, as it contains more moisture.

Different parts of the same tree vary greatly in strength, as well as in specific gravity. In the case of longleaf pine it has been proved that the lightest, and therefore weakest, part of the stem of the tree is the pith and adjacent rings, representing the young sapling of less than fifteen or twenty years' growth. The maximum weight is grown between the ages of forty and sixty years. In other varieties of timber, the age of greatest weight and strength is different; thus, in Loblolly and Shortleaf pines, the maximum is reached between the ages of thirty and forty years. The sapwood of old trees is always weaker, but this is not due to the sap, but to the fact that in old age trees naturally produce lighter and therefore weaker wood. The weight and strength of the wood decrease from the butt or stump upwards; in Longleaf pine, wood cut from a tree at the height of 60 ft. from the ground was found to be nearly 25 per cent. weaker than wood cut from the stump.

Knots, cracks, and other defects of course affect the strength of timber very injuriously. Columns less than about 25 diameters in

height, generally fail at knots, and not by direct crushing of the fibres. Even small "live" knots are injurious, but as these cannot be avoided in large scantlings, they must be accepted as an inherent defect of the material. No definite rule can be laid down as to the weakening effect of knots and other defects in a certain piece of timber; the architect must exercise his discretion as to whether the defects are so serious, considered in relation to the duty the timber has to perform, as to call for its rejection.

In conclusion, we will state briefly the most important lessons which this article is intended to convey. Timber for constructive purposes ought to be thoroughly seasoned, either naturally or at moderate temperatures; it ought to contain a large relative proportion of dark summer

wood, and to be straight-grained, and as free as possible from large and "dead" knots, shakes, and other defects. The truth of the further lesson may also be assumed—that, other things being equal, heavier timber is almost invariably stronger than lighter timber, whether of the same species or genus or not.

NOTES.

The Housing Question.
THE question of the housing of the working classes is certainly now taking a larger share of the public attention; but whether this will produce practical results remains to be seen. It calls forth, at any rate, various schemes. The latest is that of the versatile Lady Jeune, for which there is a good deal to be said. Her suggestion is that the Government should take the housing question out of the hands of the municipalities and make it an Imperial matter, placing it in the hands of a permanent Commission or similar body. There is a good deal to be said for this plan. It would enable the subject to be dealt with on larger and more consistent lines, and it would place the Imperial credit at the back of the Commission. On the other hand, it would inevitably tend still further to overburden the House of Commons, since every action of the Commission would be discussed in Parliament because, however capable the Commission might be, Parliament would be the final power with whom would lie the duty of supplying the necessary funds. But to every plan there must be objections, and we are inclined to think that Lady Jeune's idea is one which, if carried into effect, might to some degree enable this important subject to be coped with effectually.

A PARLIAMENTARY paper issued on Monday last shows that the further sums required on the Civil Service list in connexion with public buildings, for the twelve months ending March 31, 1901, amount to 1,018,731*l.*

Of that sum certain items are distributed thus:—Art and science buildings: British Museum (1,450*l.*), Natural History Museum (950*l.*), and Edinburgh Museum (100*l.*); for the adaptation of Hertford House, Manchester-square, for the Wallace Collection, 3,125*l.*, and of the buildings of the Imperial Institute for purposes of the London University, 9,960*l.*; and for works in respect of diplomatic and consular buildings in Vienna, Brussels, Lisbon, Cairo, and elsewhere, 2,000*l.* The total original net estimate for public buildings in Great Britain was 323,000*l.*; an additional sum of 35,200*l.* is now required. It is stated that the incidental expenses for the Wallace Collection are estimated at 4,275*l.*, since the preparation for opening the collection to the public involved a much greater expenditure than that at first provided for; and that the total original estimate for the Wallace Collection (8,967*l.*) should now be increased to the extent of 3,333*l.* Of the 5,000*l.* required for the Houses of Parliament buildings, 1,300*l.* represents the additional expenditure on the occasion of the recent opening of Parliament by the King and Queen in person.

Lighting the Embankment. ON Saturday afternoon Mr. Dickinson, the Chairman of the London County Council,

opened the electric works at Charing Cross which are used for the lighting of the Victoria Embankment and Westminster Bridge. It will be remembered that twenty years ago the Victoria Embankment and Waterloo Bridge were lighted by Jablochkoff candles, but the constant breakdowns made the return to gas advisable. The County Council have been considering the question of returning to electric lighting ever since 1892, so they cannot be accused of acting with undue haste. The generating station is next door to the Charing Cross District Railway station, and is admirably adapted for its purpose. Four gas engines of 70 h-p each drive four dynamos by means of cotton ropes. The pressure generated being 500 volts, the lamps are run in batches of ten in series. There are sixty-seven lamps on the parapet of the Embankment and there will be eighty on the kerbs and on Westminster Bridge. The latter lamps are double the candle-power of the former, but they are not so close together. The Council have, wisely in our opinion, made use of the old standards which were used to support the gas-lanterns, and the general effect of the lighting along the curved line of the Embankment wall is distinctly good. The arc-lamps are of the open type and have a high efficiency. They are double-carbon lamps, and the inventor claims that the parapet lamps will burn forty hours without retrimming. A special beaded kind of glass is used for the parapet lanterns which diffuses the light very successfully. We expect, however, that scrubbing and washing this glass will take up a good deal of the trimmers' time. From the electrical engineer's point of view, there is a good deal of the general arrangement of the station open to criticism. The total power generated is only some 300 h-p., and yet nearly all the large floor space is taken up with gas engines and dynamos. If steam engines and direct driving were employed, there is room for machines that would develop ten times the power. Mr. Dickinson mentioned that gas was chosen so as to avoid the smoke and dirt

inseparable from steam driving. Still, steam being so much more economical, it would have been possible to use the best Welsh steam coal producing practically no smoke, and as for dirt, it is only necessary to inspect any well-managed corporation electricity works to see how easily engineers can overcome that difficulty.

An important step has been taken by the American Senate in the appointment of a Commission of Architects to consider the best means of furthering the architectural and æsthetic improvement of Washington, and of the district of Columbia State adjoining the capital. This movement was owing, in the first instance, to the initiative of the American Institute of Architects, who presented to Congress a Bill for the appointment of a Commission which should procure a general plan for the city of Washington, and determine the location of public buildings, ordering of landscape and statuary, and the extension of the park system in the district of Columbia. The result of this has been the adoption by the Senate of the United States of the following joint resolution:—

"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, authorised to appoint a Commission, to consist of two architects and one landscape architect eminent in their professions, who shall consider the subject of the location and grouping of public buildings and monuments to be erected in the District of Columbia and the development and improvement of the entire park system of said district, and shall report to Congress thereon the first Monday in December, nineteen hundred and one.

That to carry out the provisions of this resolution the sum of ten thousand dollars be, and the same is hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to be expended under the direction of the President."

In another issue we will give the interesting summary of what may be called the æsthetic history of Washington and its neighbourhood, drawn up by Mr. Glenn Brown, the Secretary of the American Institute of Architects.

Lifting a Stone Building.

As an example of what can be done in the direction of underpinning, the alteration recently made to a two-story masonry structure in Illinois, is decidedly worthy of attention. The building, used as a County Court-house, covers an area of nearly 10,000 square feet, the walls are about 60 ft. high, and the roof is surmounted by a heavy dome. For the purpose of forming a new lower story, the entire structure was raised bodily by more than 12 ft. The mode of operation seems to have been particularly simple, and was as follows:—Rectangular holes at short intervals were cut through all the outer and two cross walls, about 3 ft. above the ground level. Two or three 15-in. steel I-beams were then inserted in each hole, the ends being supported on 12-inch square timbers parallel with the walls, and the timbers in turn were set on 10-ton screw-jacks resting upon two 12-in. square sills. By the aid of a large gang of men the jacks were screwed up gradually until the whole building had been lifted 6 in., when the load was transferred to timber beams placed on each side of the walls, these beams being shored up whilst cribwork was built beneath the jacks so that the next lift might be made.

When the structure had been raised 2 ft., the old foundations were taken away, and a third crib was added and continuously built up as the work progressed. Finally the centre crib was removed and in its place new foundations were formed, and new walls were carried up to the old work. Each front of the building includes a massive portico, having four stone columns, each weighing about 50 tons. These porticoes were raised together with the main walls by using longer steel beams at the necessary points. It is said that the work was successfully accomplished without cracking the masonry or causing any other structural injury.

Mr. F. H. WILLIAMS, of Pennsylvania, has recently published the results of some corrosion experiments made with pieces of soft steel containing respectively, 0.078, 0.145, and 0.263 per cent. of copper. The steel without copper was found to lose 1.85 per cent. of its weight under the conditions of the experiment, while the pieces containing copper lost only 0.89, 0.75, and 0.74 per cent. in weight. Some experiments with wrought iron showed that the addition of 0.393 per cent. of copper to the iron materially reduced its rate of corrosion. Further information with regard to the effect of the presence of small quantities of copper upon other properties of the iron and steel would be of interest.

The School for the Indigent Blind, St. George's, S.E.

It is stated that the sale of the site and buildings of the Schools for the Indigent Blind, in Southwark, has just been completed. The amount of the purchase-money, 140,000*l.*, was agreed upon after consultation between Mr. Reginald Roumieu, as surveyor to the charitable foundation, and Mr. Leslie R. Vigers, as surveyor on behalf of the Baker-street and Waterloo Railway Company, who have scheduled the site of the school for purposes of an electricity-generating station for the extension of their authorised line from Waterloo Station to the Elephant and Castle, at Newington, where a terminus will be constructed, at an estimated cost of 9,000*l.*, with subways communicating with the stations of the City and South London and the (old) London, Chatham, and Dover railways. The Blind School was first established near the Dog and Duck in St. George's Fields in 1799; thirteen years afterwards the premises were taken for the building of Bethlehem Hospital, and the Governors obtained a fresh site opposite the Obelisk. In 1834-8 the school buildings were enlarged and remodelled after the plans and designs of John Newman (*obit* 1859). Messrs. Roumieu & Aitchison were appointed in 1897 Honorary Architects and Surveyors to the Corporation, who will erect new schools at Leatherhead, Surrey.

Bushey Park.

THE Commissioners of H.M. Works and Public Buildings are about to erect a building in Bushey Park for the purposes of the National Physical Laboratory, as a department of the establishment at Kew. Shortly before her death Queen Victoria signified her sanction to the assignment of a lease of Bushey House, together with 30 acres of surrounding grounds, for the carrying on of

physical and scientific research by the Royal Society, and the Government agreed to increase the building grant by 2,000*l.* for necessary alterations of the house, which the Duke of Clarence, as Ranger of the park, occupied during many years before he succeeded to the throne as William IV. It had formerly been the residence of Lord North. The park, which extends over 1,100 acres, contains near the lodge some fine old oak and thorn trees, and is described by Norden in his account of Hampton Court, *temp.* James I. The famous avenues of chestnut trees, nine in number, were planted by King William III., who removed from the Palace grounds to the pond the fountain popularly known as "the Diana fountain," which in the inventory of 1659 is described as "one large brasses (*sic*) Statue on the top of the Fontaine called Arethusa." The statue, by the way, holds a gilded apple, and as Mr. Ernest Lav suggests in his work upon Hampton Court Palace, may be intended for Venus. The single gate at the Teddington entrance was replaced three years ago with two gates separated by an iron pier, and for a length of about 50 ft. an iron railing was substituted for the high wall. Last June was unveiled the memorial, in terra-cotta, which Mr. Buckmaster, of Ashleigh, Hampton Wick, set up in honour of Timothy Bennet, the shoemaker of Hampton Wick who, at his own charges, successfully resisted the closing, about 150 years ago, by Lord Halifax of the footpaths across the park to all persons other than ticket-holders; that obstruction, which existed in the time of Charles I. and Cromwell, had been removed by Charles II. shortly after the Restoration. Home Park (about 750 acres) and Bushey Park formed part of the 2,000 acres acquired by Cardinal Wolsey when, in 1514, he took a lease for ninety-nine years at 50*l.* per annum of the Preceptory, with its "manor-house" (Hampton Court), of the Knights Hospitaller of St. John of Jerusalem, to whom, in 1211, the manor had been devised by Joan, widow of Sir Robert Gray.

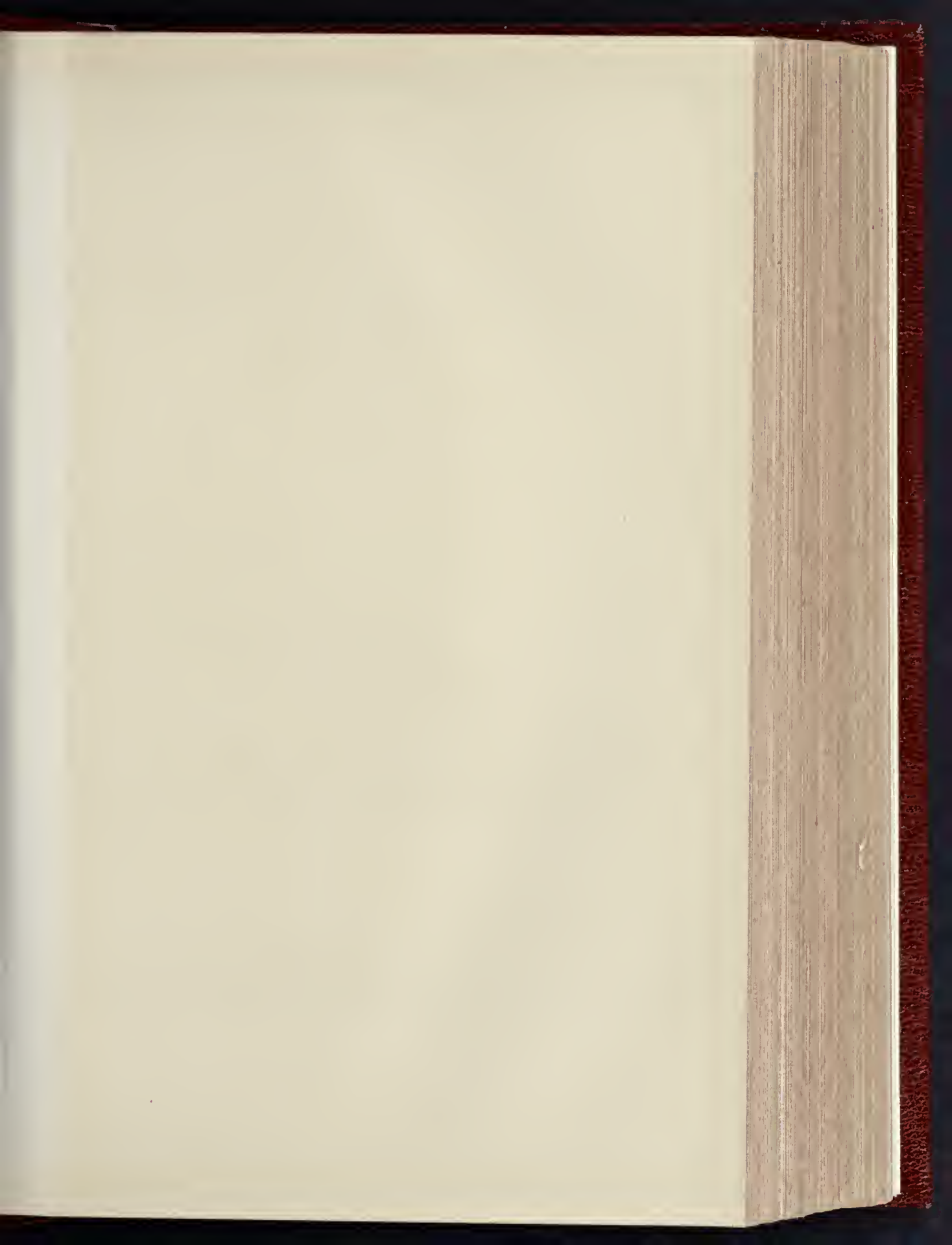
LETTER FROM PARIS.

THE jury appointed to judge the "Concours de Maisons," or the annual competition for the medals and awards to be given to the architects and owners of the most artistic houses erected at Paris during the past two years, has now been completed by the adherence of the two members elected by the builders of the fifty-nine houses taking part in the second competition. The two new members are MM. Vaudremer and Nénot. The jury is now composed of four architects, MM. Bouvard, Sauger, Nénot, and Vaudremer, and five Municipal Councillors, with M. Bouvard as Chairman. The jury will commence operations this week. Twelve medals will be awarded, and the owners of the premiated houses will benefit by a reduction of half of the building taxes.

The Académie des Beaux-Arts has decided that in future the competitions for the annual Prix de Rome shall be anonymous; the names of the competing students and those of their professors shall no longer, as has been the custom until now, be marked on the plans and drawings. This decision has caused much dissatisfaction amongst the students. The public exhibition of the drawings will, however, take place as usual for three days before the visit of the jury.

The Higher Committee of the Ecole des Beaux-Arts has decided to add a new clause to the general rules of the Ecole concerning the awards to students of foreign birth, a decision which is the cause of considerable emotion in the section of architecture, where foreign students are numerous. The new article, No. 105, runs in substance as follows:—

"Foreign students—male or female—cannot







124 PHOTO. SPAGUE & CO. L.P. 4 & 5, EAST HARDING STREET POTTER LANE E.C.



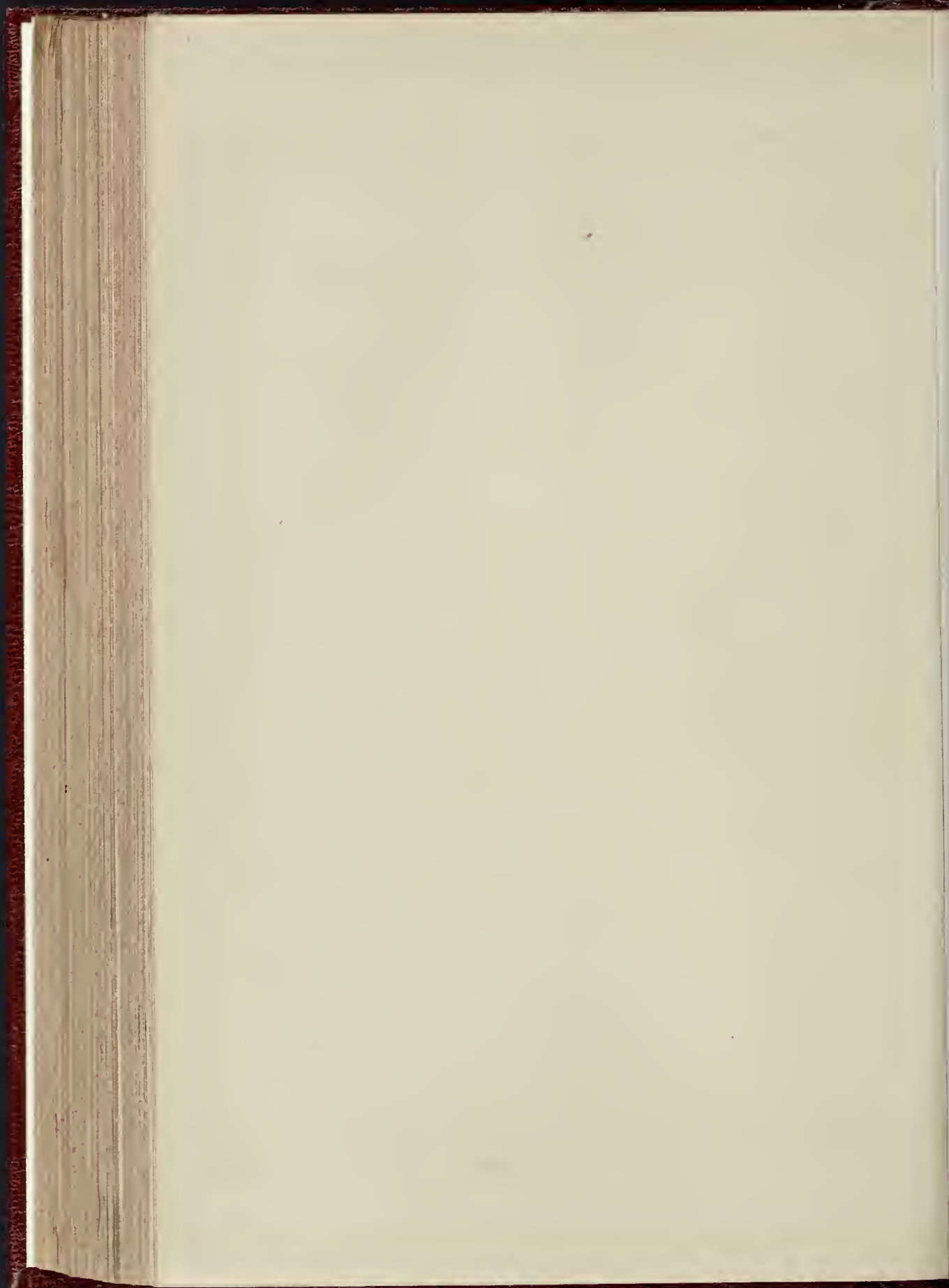
THE BUILDER. MARCH 2, 1901.





IN PHOTO. SPRAGUE & CO. 4 & 5 EAST HARBING STREET, PETER LANE, E.C.

PART OF A TAPESTRY PANEL: "ADORATION OF THE INFANT CHRIST" (FLEMISH: circa 1510).—FROM A DRAWING BY MR. HERVEY RUTHERFORD.



claim the awards of sums of money coming from the various foundations of the schools, or connected with the medals awarded for the school competitions. In the cases where the jury designates a foreign student as winner of an award consisting of a medal, prize, and sum of money, the foreign student will be declared winner of the honorary award, viz., the diploma and the medal, but not the monetary reward, which shall be reserved. The jury will then decide whether the work of a French student in the same competition is worthy of an award, and in that case the money award will be given to the latter. In the contrary case the sum of money will be reserved and divided between two French students, winners of the same competition in the following year.

The subject for the annual competition in decorative architectural design, called "Concours Rougevin," was an episcopal throne, and was competed for by 186 students of the first class. The awards were made on the day following the application of the above new rule regarding foreign students, and the winner of the first medal, second prize—Mr. Brown, an American student—was the first foreigner to whom the new rule was applied. The first medal, with a money prize of 241, was awarded to M. Cret, pupil of M. Pascal, the second medal being awarded to Mr. Brown, pupil of M. Laloux; but the money prize, of a value of 161, was awarded to M. Roy, winner of the third medal.

The organising Committee of the next Salon of the "Société des Artistes Français" (Old Salon) has elected MM. Pascal, Scellier de Gisors, and Courtois-Suffit as delegates for the section of architecture. The exhibits of drawings of architecture, &c., should be delivered at the Grand Palais des Beaux-Arts from April 1 to 5 next. The two Salons—Old and New—will both hold their exhibition at the Grand Palais des Beaux-Arts, the first from April 22, the second from May 1, and both to June 30, 1901. The New Salon has modified its rules to the effect that foreigners shall no longer form portion of the jury, and that members of the society shall be limited to five exhibits only. The Old Salon admits two exhibits only from each member, but each exhibit may include several drawings in one frame, and the jury reserves the right of excluding any drawing which may not be considered absolutely necessary for the proper comprehension of the whole exhibit. The public will now have to pay a separate entrance fee to each Salon instead of (as has been the case at the recent Salons) one entrance fee for visiting the two Salons.

The city of Paris has just acquired for the sum of 1,600, the remarkable high-relief "Frise des Travailleurs," which decorated the entrance to the Porte Monumentale of the Exhibition. It is proposed to place this frieze in the new museum at Montmartre, but it would appear to be much better in place as a backing to some circular sward in the Cours la Reine. The frieze is due to the talent of the young sculptor, M. Anatole Guillot, and the skill of M. Emile Muller, ceramist.

The Commission des Programmes at the Ecole des Beaux-Arts gave "A Building for National Assemblies at New York" as the subject for the competition called "Prix de Reconnaissance des Architectes Américains." The building was to comprise a large assembly hall, capable of containing 4,000 people, for national assemblies and for the Presidential elections, and was to contain an important tribune at the end of the hall for the speakers; six large rooms for committee meetings, with private rooms for sub-committees and the chairmen; a large hall for the archives, a large library, and all the necessary dependences; an immense waiting hall preceded by vestibules for the accommodation of a large concourse of people; refreshment and correspondence rooms, reading-rooms and press-rooms, post, telegraph, and telephone offices, and an important signal tower. A connexion is to be made with the Metropolitan Railway by means of wide staircases and lifts. The employment of brick in the construction was recommended as being the material largely in use at New York. Stone and rich marble from Europe should also largely enter into the design, and as the funds (due to the donation of a rich person) were unlimited, nothing should be spared as regards the sumptuousness of the exterior and interior of the building and the employment of architectural and sculptural orders. The longest dimension of the available ground was 630 ft., the scale of the elevations was to be 1:25th full size. As no prize was awarded last year, two equal prizes were given this time for the best plans and

designs for this building, for which the programme was truly Prix de Rome, and these two were carried off by M. Charles Duval, pupil of M. Pascal, and M. Hulot, pupil of M. Marcel Lambert.

The efforts of the Parisian archaeologists and some of the members of the Commission du Vieux Paris concerning the preservation of the old residence called "Résidence de la Reine Blanche," in the Rue des Gobelins, of which mention was made in the last letter, have met with success. The Government has given orders for complete measured plans of the old building, which M. Jules Geoffrey, Director of the Manufacture Nationale des Gobelins, proposes to add to the present manufactory and instal therein an interesting museum of Gobelins' work. The Commission du Vieux Paris has named M. André Hallays, editor of the *Journal des Débats*, and M. Henri Lavedan, the dramatic author, as members of the Commission in place of the late Dr. Lamoureux and M. Jules Perrin.

M. Nénot, the architect of the New Sorbonne, has been appointed "Commandeur" in the Legion of Honour.

The new building of the Cour des Comptes which will replace that which existed on the embankment opposite the Tuileries and was burnt down during the Revolution of 1870 is very interesting as an example of the employment of armed cement in the construction of a building destined to contain important documents and archives, and for that reason necessarily as fireproof as possible. The architect, M. Moyeux, has constructed the staircases, vanits, floors, and all the interior portion entirely of armed cement, including the immense number of cupboards, shelves, and pigeon-holes for storing the archives, the whole of the latter being painted with a metallic white enamel paint called Siléxore, which will preserve the surface and at the same time keep the interior bright and light.

The new lines of the Metropolitan Railway, viz., those of the Palais Royal (Place du Danube), Auteuil (Opéra), and Bastille (Place de la République) are now being put in hand.

The interesting old church of Montmartre, one of the oldest of Parisian churches, has been saved from destruction, and is now in the hands of MM. Sauvageot and Boutré, architects, for complete restoration. This old church, of which the chapel was consecrated in 1147 by Pope Eugène III, is to be carefully restored and made complete, a large portion of the oldest remains of the building have been discovered, and sufficient data of the old tower which fell several hundred years ago has been found to facilitate the restoration and reconstruction. The magnificent marble column which supported the dome, and which were brought over by the Roman legions, have been discovered surrounded by a thick coating of cement and plaster. The work will occupy about two years and will cost 12,000.

The well-known Pavillon de Hanovre, an interesting specimen of eighteenth century French architecture, at the corner of the Rue de la Michodière, will not be saved from the demolisher's hands despite all efforts which have been made. The pavilion will be pulled down and its place occupied by a large building for the offices of the United States Mutual Life Assurance Company.

The leases have been signed handing over the building of the Bourse by the Town of Paris to the company which is about to undertake the work of restoring the present building and the important additions to be made on either side.

The three new Parisian hospitals destined for sick children, and to replace the old Trousseau Hospital, will be inaugurated early in April. The first situated in the Rue Etex, and called Hôpital Brelonneau, will contain 234 beds; the second, in the Rue Michel-Bizot, called new Hôpital Trousseau, will contain 237 beds; the third, on the Place du Danube, called Hôpital Hérod, will contain 221 beds.

M. Rodin, the sculptor, has accepted the presidency of a new literary and artistic society, which professes as its object to promote the artistic education of the people by teaching them to understand the union of the beautiful with the useful in life. With this object, and under the patronage of the author of the too celebrated statue of Balzac, provincial centres are to be formed by groups of artists carefully selected, who are to organise lectures and exhibitions intended to refine the popular taste, and to direct it towards an æsthetic ideal, formulated by M. Rodin. We have not much

faith in the results of this mission, which seems likely to share the fate of the new Académie des Beaux-Arts, which M. Gérôme has endeavoured to found, but which has come to nothing. This eminent artist had obtained promises of support from members of both Salons, but they seem suddenly to have reflected that the new society would injure the existing Salon, and have all begun to excuse themselves from acting, more especially as the first condition was that they should resign membership of the Salons.

The sister of Courbet, the late painter, has been desirous to organise in some municipal building a permanent exhibition of several pictures which her brother had left to her, and which she proposes to present to the municipality. The Hôtel Lauzun has been spoken of as the place for this exhibition. The pictures might be an interesting possession for the city of Paris, but they would be very much out of place in the Hôtel de Lauzun. Courbet was a realistic painter of pictures sombre in colour and often incorrect in drawing, and the refined decorations of the Hôtel Lauzun, a building eminently aristocratic in its associations, would form a very unsuitable frame for them. The Hôtel de Lauzun itself will be one of most interesting artistic curiosities in Paris, if the intention is carried out of collecting here, in their original surroundings, the furniture, tapestries, and objects of art and luxury belonging to the aristocratic residence of a "Grand Seigneur" of the seventeenth century. But Courbet, the Communist painter, would be sadly out of place there.

At the Bibliothèque Nationale the arrangement of the new buildings is in progress, in which, towards the autumn of this year, the collection of engravings and medals will be installed. The new wing, which has been a year in building and has cost 400,000 francs, is just finished; and M. Pascal, the architect, will shortly commence another addition, intended to contain a reading-room lighted by electricity, and which will be open in the evenings. Little by little the Bibliothèque, which has been left so many years in an unsatisfactory condition, will in the end be entirely rebuilt; but as it is a question of voting money, and Parliament has shown itself very parsimonious, the whole work will probably not be finished for four or five years.

M. Noël, who has been commissioned to execute the architectural part of the monument to Balzac, has designed a pedestal on very plain lines, but which will harmonise with the façade of the Palais Royal, in front of which the work of Falguière is to be placed.* It is probable that the monument will be completed for inauguration on May 16, which is the anniversary of Balzac's birthday. The monument to Victor Hugo, the model of which has been executed by M. Barrias, is at present being cast at the Barbédienne Foundry.

The Luxembourg Museum is at present closed for various re-arrangements in view of the return of the works lent for the great Exhibition, and for the placing of the new works required by the State. In the meantime M. Bénédite, the curator, has organised in a special gallery an exhibition of the works of Rosa Bonheur, which will have great interest for the artistic world.

The exhibition of the "Union de Femmes peintres et sculpteurs" is being held in some of the galleries of the large Art Palace in the Champs Elysées. The Duchesse d'Uzès is now the president of this association. The exhibition includes 907 pictures, and thirty-five pieces of sculpture, which are arranged on the first floor of the building next the Avenue d'Antin. There are very few original or interesting works. Among the landscapes we may mention the "Champs Elysées" of Madame Nancy Adam; a view of Angoulême by Madame Lenoy; and the "Eglise de Saint Martin," by Mdlle. Bonlian. Among the portraits, Mdlle. Madeleine Carpentier shows really fine qualities of composition and drawing. The pastels by Mdlle. Vallet-Bisson, and the translucent enamels by Mdlle. Montigny, are also worthy of note.

We have to record the death, at the age of sixty-three, of the poet Armand Silvestre, who was also an art critic of great taste and knowledge, and who filled with distinction the office of Inspecteur des Beaux-Arts to the Department of Public Instruction.

Paris has lost a well-known architect in the

* The statue is illustrated in the *Builder* of June 10, 1899.

person of M. Ernest Brunarius, Officier d'Académie, who was killed last week in the catastrophe brought about by the avalanche at Mount Mirantin. Born at Paris in 1857, he became pupil of M. Coquart at the Ecole des Beaux-Arts, carried off two medals at the Salons of 1888 and 1889, and was architect of several buildings at Paris in which he showed a great originality of ideas and design. One of his last works was the Protestant Orphanage for Girls at Puteaux, a building which on account of its excellent arrangement of plan and the simplicity of its style may be considered as one of the types of this kind of establishment.

STAPLETON NEW INFIRMARY COMPETITION.

The designs for the infirmary which the Bristol Guardians propose to erect at Stapleton, near Bristol, were on view the whole of last week at the ancient St. Peter's Hospital. Fourteen architects were invited to compete, the assessor being Mr. Keith D. Young, and seven designs were eventually received, all of which exhibited knowledge of the subject and were above the average.

The site is situate near the city, with Stapleton Church and the river Frome on the west. It will be reached by a new road from Blackberry Hill, which upon the opposite side bounds the grounds of the lunatic asylum, having the workhouse to the north-east. A careful model of the site, prepared by Mr. W. S. Skinner, was on view in the room.

The first premiated is design E., by Mr. H. Percy Adams, London. The building fronts to the south, and consists of coupled pavilions of sick wards to accommodate 852 patients, three of which are upon the west side and two on the east, leaving space for the extension of another pair, the administration block in the middle, the whole bisected by a horizontal corridor. Above this block and with an intervening space are the laundries and machinery, &c., and higher still on the site, parted by a brick fence wall about 60 ft. distant, is placed the isolation hospital with its offices and adjuncts in three small blocks on a terrace. These have been arranged for double pavilions of six beds each, with a small detached block between, containing doctor and nurses' rooms, wash-house, &c. Above these buildings is placed the mortuary, while at the north-east corner of the site have been located the lodge and receiving block, which latter is arranged with double wards for eight of either sex, with the usual adjuncts, besides waiting-room, attendants' room, &c. The first floor has been allocated to patients' clothes store, arranged in bays, with shelves all round; three additional storerooms and a bedroom are also provided.

The pavilions of the infirmary are connected by the long arterial corridor before mentioned, which is 10 ft. wide, arched on the ground floor, enclosed with windows on the first story, and having open sides on the topmost floor under a covered roof. The ward pavilions are also connected at either extreme end by iron balconies that lead one to the other, but afford no direct access to the ground from the top, excepting by the one principal stair-case at either end of central corridor. This has been suitably and properly arranged and isolated from adjacent wards. An unenclosed patients' lift is placed in the well of stairs, and the nurses' water-closet and scrubbers' room and a movable bath are also conveniently located here. There are four children's wards, respectively two of thirteen beds and two of twelve beds, divided by a glazed screen in each case. The end of each long ward so treated has a cross ventilating passage right across, giving access to the balcony, and the space so enclosed provides the sanitary adjuncts, as placed elsewhere in towers, of water-closets, sink and bathroom. The male and female wards are planned on the principle of one window to every two beds, excepting in the wards for lying-in women and offensive cases of either sex, where the arrangement is one bed to two windows, but in all cases there are no windows provided at either end.

The bathrooms are not in the sanitary towers, which latter are very much cramped in planning, two water-closets, sinkroom, and lavatory, including a lobby, being arranged in a space of about 15 ft. square.

The administrative department occupies the

heart of the lay-out, and is admirably arranged. This measures about 280 ft. from top to bottom, by 160 ft. across. The lower half, with the exception of a few projections, is lighted from one side. The entrance-hall and offices are at the bottom, to the right the medical officers' apartments, to the left the nurses' dining and recreation rooms. The upper part of this court is occupied by the chapel, lighted on one side and seating 250; this is approached from two corridors by a vaulted vestibule. The upper part of the block on the ground floor is taken up by the kitchen and steward's department, which is economically arranged. Two stories over, the topmost being partly in the roof, are devoted to the sleeping quarters of the whole establishment, lighted on one side, properly separated, and provided with escape doors.

The entire block plan is the most unencumbered of any shown. The elevations are treated in a broad and pleasing manner, and the drawings, which cover fifteen strainers, are vigorously executed; there is a complete absence of figured dimensions on the drawings.

The second premium has been awarded to design A., by Messrs. Giles, Gough, & Trollope. Naturally this does not materially differ from the others excepting in the planning of the administrative department and the arrangement of the sanitary towers, which, although they include the baths, are more spacious. A full and carefully detailed block plan gives an excellent idea of the whole proposal, and fire-escape stairs are provided.

The planning of the isolation and receiving block is more fully treated than in the selected design, the patients' clothes store being on the ground floor, which is a good point. The administrative block is, however, somewhat crowded. The chapel, standing in the front court, has four accesses, with the dispensary behind and the operation room over. An element of importance and of institutional character has been given to the elevations, and it is unnecessary to say that the whole of the drawings have been clearly and carefully shown.

Design B., by Mr. Arthur Marshall, of Nottingham, to which the third premium has been awarded, is a very attractive set of drawings, and the problem is illustrated in an able and pleasing manner. The general arrangement of the administrative block is, however, unlike designs E. and A., in that it is recessed in the middle, with large projecting wings on either side, and a fine central feature of a tower. The wards have curved ends, and the details show a full knowledge of the subject. The sanitary towers are not, however, effectively isolated from the wards, and although the plans have many points of considerable merit, they do not as a whole, apparently, seem to completely provide the accommodation exhibited by the other premiated designs. A general sketch elevation is shown of the whole frontage, and the whole of the drawings exhibit much ability.

Design G., by Mr. C. W. Bevis, of Southsea, has a well-disposed administration block and good open courts. The isolation block is placed at the north-west corner of site at an obtuse angle to the other buildings. The chapel is separated from the general buildings, and the mortuary is placed near the entrance lodge. A good arrangement is shown connecting the bathroom with the sanitary tower and ward by a triangular lobby. No ward has been arranged with one bed to two windows. The elevations are simply treated with hipped roofs.

Design F., by Messrs. Newman & Newman (London), shows much knowledge of the subject, but it has several defects in detail which are evident after a careful inspection, although there is not much manifest deviation in the main lines. There is, however, some extravagance of space shown in the long flats, 5 ft. to 6 ft. wide, over the administrative department, although the blocks are well broken up; further consideration would probably have produced more economy. The isolation of the principal stairs, nurses' water-closet, &c., in the ward pavilions seems to be indispensable, and cupboard and store accommodation is very short. The day rooms are provided at the end of the wards.

In design D., by Mr. H. C. M. Hirst (Bristol), the wards also have their day rooms at the end of wards, which are made conspicuous features, and the baths are placed in towers corresponding to the sanitary towers. The isolation blocks are planned in an unusual way, the two wards forming an L, with the

nurses' room in the angle. The elevations are utilitarian in character.

In design C., Mr. Henry Williams (Bristol), places his entrance from the city at the lower part of the site, and the receiving wards are tacked on to the main building at the axial corridor. The plan is arranged with three pavilions on the left of the administration block and two on the right, all four floors in height. The planning of the administration department is somewhat involved; the chapel is on the second floor in front, and is made a prominent feature in the elevation; the disposition of the buildings is well shown on the ground. The grounds are well laid out, tennis courts being provided, also shelters and conveniences for both sexes.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ADDRESS TO STUDENTS.

An ordinary general meeting of this Institute was held on Monday evening last at No. 9, Conduit-street, Regent-street, W., Mr. Wm. Emerson, President, in the chair.

The minutes of the last meeting having been taken as read,

Mr. W. J. Lock, secretary, read the following "Address to Students," prepared by the President, whose voice did not permit him to read the address—

"In the few words I have the pleasure to address to my younger friends—I will not say to the students, for in our profession we must all be students to the last days of our lives, but to the junior members of the profession—I will endeavour to lead you to some higher planes of thought in relation to the practice of the art of architecture, rather than to mere practical business elements material to success. I presume, of course, that those of you who have taken the trouble to pass our examinations and become members of this Institute, have in your minds the idea of practising in the profession. That is to say, I presume your intentions are those of actual performance of an architect's duties in the designing and carrying out of building operations, as opposed to mere theory, the function of the professor. I will therefore consider some few of the things involved in this word practice, the objects, aims, and points in connexion therewith, that should be weighed by one undertaking such responsibilities.

There is a right use or proper employment of architecture. I need hardly point out that building is the most necessary of all sciences; in its objects it subserves the highest and the lowliest wants of humanity. It provides fitting tabernacles for the worship of the Creator, suitable courts for the administration of governments and justice, appropriate palaces for the great and dwellings for the poor; it supplies institutions for the education of all classes in all branches of learning, for the amelioration of the diseased, the poor, and the mentally afflicted, and every kind of commercial establishment; also all other forms of edifices to meet the complex requirements of the world: all these in their aggregation evolve cities, towns, and villages. It is a science, but the love of beauty inherent in our natures makes us demand that it be more—that it be an art as well—and this side of it is architecture, and, if good, unites with it all arts. It is therefore of the highest universal importance that those practising it, on whose skill and taste its proper employment is dependent, should be so educated as to plan for use, to design with appropriate beauty, and to construct with scientific knowledge.

To this end I pointed out last year how a thorough education, not only in architecture itself, but on a wide and comprehensive basis, is essential; and this education should not only be gained by study of man's work in the arts and sciences, but also by study of God's work in nature. There should be besides an inquisitive, diligent searching into the reasons of things. The constant use of our faculties in effort with application and judgment is essential, and our highest duty. Idleness will not compass proficiency. As Shakespeare says in 'Hamlet':—

'He that made us with such large discourse,
Looking before and after, gave us out
That capability and godlike reason
To rust in us unused.'

Architecture should be more than mere building in the best material and manner; the thought and needs of the time must be ex-

pressed. It does not suffice to satisfy the one only who has conceived it, but should be capable of pleasing all people in all times. Such a true expression of the architect's mind—

'Like the unchanging sun
Clears and improves whatever it shines upon:
It glids all objects, but it alters none.'

It is the divine element in man materialised in his works: his two natures, the human and the spiritual, are evidenced in his individual conceptions.

In real architecture there must be not merely the individual bias or personality exhibited by one's particular devices, peculiarities, or the excellences of one's draughtsmanship, but there must be the expression in all sincerity of spiritual sentiment also. Ralph Waldo Emerson says:—

'The hand that rounded Peter's dome
And groined the aisles of Christian Rome
Wrought in a sad sincerity;
Himself from God he could not free.
He builded better than he knew,
The conscious stone to beauty grew.'

That is what I take to be the meaning of the proverb, 'Ars est celare artem.' The artist's material personality or mechanical dexterity should not be predominant so much as the spiritual or divine influence inspiring him. If such be our aim, we shall rightly use any powers of architectural design with which we may be endowed, and be enabled to express the highest mind that is in us by the forms of which draughtsmanship will convey the conventional rendering. This habit of mind, combined with constant practice, care, and accuracy, will lead to dexterity of expression of feeling which is essential.

But more than habit of mind for fitting expression in our art is necessary for successful practice. There should be habit of method in study, and attention to apparently trifling details, and in business conduct. For as to study it has been well said:

'If not to some peculiar end designed,
Study's the specious trifling of the mind.'

As to the details and little points that constantly arise, if there is not the methodical habit of carefully looking into them, things seemingly insignificant are easily overlooked, resulting in endless trouble to both the client and the architect. In regard to habits of method in business, I believe that the men with methodical habits usually get through infinitely more work, and do it better and quicker, than those lacking in this respect. Methodical habits tend to avoidance of worry, for an architect's life consists, to a large extent, of attention to details of all kinds, which should all have methodical attention in turn. And there is nothing so prejudicial to artistic effort as worry. It should be avoided in every way: a quiet and restful mind is essential to the right exercise of thought and creative power. Moreover, to worry at all is bad, and a correct feeling of what life is, and its inseparability from difficulties and troubles, should prevent our giving way to it. A nature so disposed frequently troubles itself over evils that never arise; it shows lack of faith, for

'Deep in man sits fast his fate
To mould his fortunes, mean or great.'

Therefore the architect whose soul is in his art should strive by methodical habits and rules of business to render himself as impervious as possible to worry. Rules no doubt are irksome, and perhaps especially so to the artistic temperament; but without method or rule one is apt to be slovenly. One good rule is to encourage a habit of work every day, and this—however disinclined one may feel, and however little in the humour—with the effort to work the imagination will fire. It may be said the artist cannot work without the inspiration; but he can go on waiting so long for the inspired feeling that it may never come. An architect has this advantage in his life, that effort in the same groove does not recur each day; the variety of the claims upon his attention is one charm of his work. Cultivate earnestly methodical habits. I speak with some reason, for I was never brought up with these habits, and have learned the great necessity of them, particularly to the architect.

The importance in practice of study with thoroughness in both the theoretical and practical sides cannot be too strongly inculcated. There have been articles in some of the papers lately pointing out how, if England is to retain her position in trade and power, the highest intellectual education is necessary in

all modern businesses. Not merely smartness or push is wanted, but intellect thoroughly trained, and of a type in which it is stated this country is woefully deficient. It is said that our business men are simply amateurish and incompetent compared with the newer type of highly educated Germans and Americans.

If it be true that in trade this highly trained intellect is so essential, in how much greater degree must it be so for the profession of architecture! For beyond the mere business element, without which, to a certain extent, it is impossible for the architect to practise successfully, there is the necessity for a thorough knowledge of art, with much of many other subjects, such as science, history, &c., combined with the study necessary for the acquirement of that dexterity without which he cannot express his ideas. How superior the educational methods in regard to architecture are in America to those in this country has lately been shown in our 'Journal' in a most able manner by Mr. Arthur Cates.

Therefore a serious reflection for the young student in this country is how very much his education must depend upon himself and his own exertions if his work is to be more than that of an amateur and have vital force, and if he wishes to succeed by his power and competency rather than by smartness and push, or playing off upon the public the eccentricities of fashions of the moment. The days of mere building by architects in this country are, we hope, fast passing away; and this century the public will demand, not only that the architect be versed in all practical details of his calling, but that, by really cultivated taste and intellect, he may build with power, beauty and perfect utilitarianism.

But by those who wish to excel as artists (time must be allowed for the study of Nature. The delicate tones of colour in the trees and herbage and sky, the perfection in drawing and beauty of colour in details of leaves, flowers, fruit, animals, birds, insects, &c., and the forms of fishes are lessons in decoration which should be learned at first hand. Deductions and inspirations innumerable may be gathered from them, with a freshness no study at second hand from man's work can give. Burges used constantly to make his pupils draw all sorts of flowers and insects and colour them, as well as study from the life in his office. Emerson says: 'In every landscape the point of astonishment is the meeting of the sky and the earth, and that is seen from the first hillcock as well as from the top of the Alleghanies.' And what a truth is here! It is in the meeting of the heaven and the earth, the spiritual and the material, that art is rendered capable of conveying sentiment and lessons.

The study of Nature, no matter under what aspect, puts some germ of life, some sentiment, into the spirit of the artist, whether he be an architect, sculptor, painter, poet, or musician. Inconsistencies or vulgar eccentricities are never found in Nature, though infinite wonders are discoverable to the observant mind; and in its study one may learn all beauties of proportion, form, and colour. Therefore, cultivate habits of study and reading, as Bacon said, 'not to contradict or believe, but to weigh and consider.'

Higher education is absolutely necessary if the status of the architect is to be raised. It should be remembered that doctors and barristers are almost always University men; and it will be well to bear in mind that the sooner it becomes the rule, rather than the exception, for architects to receive a higher, or perhaps a University education, the sooner will the acknowledged status of the profession be elevated.

Then for facility of practice the architect should cultivate his memory; and as all cannot perform feats of memory, a practice of writing down useful information should form another habit. The architect in designing not only requires to remember details of old and other work, as a guide, incentive, or restraint to his own, but he must recollect endless details of construction and many specialities for building purposes necessary in modern structures; and this is no trivial matter. But, above all, he must remember the effect certain proportions, details, and compositions have given, in isolation or when in juxtaposition in former examples, ancient or modern. He will thus be enabled to reject or improve the crude, and profit by the excellent. Masters in our art have followed the teach-

ing of many old examples, and they have felt it necessary to reject others. Originality of design is not shown by the utilisation of forms which better and more cultivated men than ourselves have seen good reason to discard. An educated perceptive faculty and a good memory are necessary to realise the full teaching of past times.

There is also, in connexion with the practice of the art of architecture, such a word as proportion; and the value and meaning of this word may easily be lost sight of. To the architect's mind may probably immediately be suggested the comparative relation of one architectural detail to another and to the whole composition. But besides the objective symmetry and harmonic degree of form or size, proportion may be considered by the architect in other ways. Of course, proportion in this sense is the very first essential of fine architecture. It should be an inherent faculty in the architect and artist, but it may be cultivated.

It is by the proportions as much as—or even more than—by the beauty of detail that the mind is impressed by works like the Parthenon, the Pantheon, Westminster Abbey, Chartres Cathedral, the 'Mercury' by Praxiteles, the 'Venus di Milo,' Michelangelo's 'Moses,' or Cellini's 'Perseus,' or by the delicate refinement of the proportion of scale and relief in the decoration of the Villa Madama. And proportion must descend, also, to the smallest details. The perfection of Cellini's goldsmith's work is as much in its proportion and as important to its excellence as his wonderfully finished detail. The same applies to Etruscan goldwork and the best Indian works. Proportion in colour is also a most important factor in the excellence of artistic work.

The study of nature is the guide as to how much of any one colour will harmonise with another. How often is work spoiled by the introduction of too much colour or by its tone—by the coldness or excess of blue, or the foxiness of too much red, or the unpleasantness of a superabundance of yellow! Such faults never occur in nature. The general tones of nature, whether brilliant, as in the East, or sombre, as is often the case here, are always in perfect harmonic proportion; so also are the details of brilliant colour in birds, insects, and flowers. It should be noticed that it is only in details like these that brilliant spots of colour are found in nature. The Owen Jones prize is given as an incentive to study of colour in reference to architecture. It might well include in the students' works studies from nature.

It seems a pity that a greater proportion of colour cannot be effectively introduced in the buildings of our towns, which are usually so fearsome in their sombre dullness. But there can be no doubt much colour in buildings requires a bright sunshine, as in Greece, Egypt, and India, to give it its true value. Nevertheless, I think we might be a little more cheerful in our streets with some advantage.

There is also a proportion in architectural work, which requires to be maintained, between coarseness and refinement. This is a very subtle point in all good work. Too much refinement in architectural work tends to weakness of effect, and deprives it of its masculinity. At the other extreme, 'muscular' architecture, as it was termed when the 'reaction from the Late Perpendicular of the early part of the century set in, and a phase of Early French architecture was the fashion, may degenerate into coarseness. It is the carefully balanced proportion between these that avoids either extreme. The effect of all the finest architecture has been attained by a combination of strength and power with refinement of well-proportioned and beautiful detail.

Too much care cannot be bestowed on the proportion that sculptured and other decorations bear, first, to the whole composition, and, secondly, to each other. They either give scale or destroy it. They either adorn it or make it appear tawdry. In all this the architect's should be the guiding spirit, however much may be done by the craftsman or sculptor.

Then there is the proportion that the workshop of one's art should bear to one's life. It is often said, as if it were the greatest praise, 'He lives solely for his art.' I doubt if this could be said of any truly great man. It is too circumscribing and belittling. The larger the environment the greater the sphere of usefulness in life; and so long as the time occupied in other affairs is not out of pro-

portion to the valuable hours necessary to one's life's work, mingling with others and doing work in other ways enlarges the mind, is our moral duty, and should benefit our art.

Success is an object of life, but need not involve a want of sympathy with others, nor pushing on self, regardless of their claims, nor flinging on one side all other considerations on the road. Success in the practice of an architect, as in other callings, should be aided by a proportionate feeling sympathetic with a life full of effort and enthusiasm.

Nevertheless, success in the art of architecture should be the settled purpose of him who proposes to practise, and that to the fullest extent, 'in proportion to his being a human being, living his life amongst his fellow-creatures, to whom he can impart or derive something. The aim of culture is to make us better company as men and women in the world.' The greatest men, like Michelangelo, Donatello, Cellini, and Goethe, were all men of other affairs besides their art, and were in sympathy with their surroundings of thought, work, and politics. To quote Ralph Waldo Emerson again, 'However much of real power is found in solitude and in silent moments, a proportion must also be developed by exchange of thought and ideas in mingling with sympathetic interest with our fellow-men.'

There is also a proportion that should be observed between the ideal and the sentimental. The one is the spiritual in our art, the other the simply sensuous.

Aestheticism, another American writer says, is not 'the vital force inherent in the idealist; much of what in our architectural art of to-day seems to satisfy the casual and thoughtless is devoid of the life and spirit of art. The one is the appreciator and creator of all noble forms of art, the other is at home among the ginger-jar style of decorative effect.' 'It is the idealist who will, with a strong faith in the spirit that is in him and with energy of purpose, strike out for himself fresh achievements. He may fail, but he is ready to take the risk, and has the courage of his opinions. To the aesthete a lower plane of work altogether, a pretty tone of colour or eccentric form, a delicate curve or a sentimental line of poetry, devoid of the spiritual essence of the ideal but pleasing to the fancy, will afford infinite satisfaction.'

So there should be proper proportion maintained between artistic sentiment and practical purpose. The man who sacrifices the purpose to the art is not a useful member of the community. While he who sacrifices his art altogether to utility does not elevate the community. It is the correct judgment weighing the proportionate values of the one and the other which makes the architect.

It has been said the aim of the ancient philosophies was to raise man above common notions of happiness, an endeavour to crush his humanity and develop his divinity, to make him happy by refinement of mind and soul and by the ignoring of his material pleasures—meaning, I suppose, if this be a true rendering, complete self-denial, not so much for the benefit of humanity at large as for the individual's own exaltation. The Baconian philosophy which marked the beginning of the great strides in science and utilitarianism that have taken place during the last century was very different. It taught that nothing can be beneath our attention that may minister to the physical or material benefit of mankind. The first was grand, but scarcely attainable, or alone desirable for our human natures; the second was attainable and useful to man as he is. So the art part of architecture, the soul of it, a most potent factor in mental pleasure, is for the satisfaction of the divine side of humanity; but alone, it does not altogether satisfy the requirements of humanity; the utilitarian side of architecture is also most necessary for the satisfaction of our physical needs. The needs of both soul and body must be fulfilled in good work, and are equally worthy of the highest efforts of our intellects and imaginations. In architecture it is the hopeful spirit of the men of imagination coupled with practical common sense, a level brain, and a cultivated taste that is wanted to weigh well the boundaries of the respective values of a practical idealism and a maudlin sentimentalism.

Then there is the necessity for a proper proportion being maintained between work and rest. There is such a thing as staleness. The want of recreation makes a man dull, unfit

for companionship or sympathetic mingling with or interest in his fellows; and his work suffers in consequence. Also there must be margin for reflection and thought. Great achievements usually germinate in quiet moments. An overworked brain and no physical activity or recreation must have a bad result both on a man's work and his life. So time should be proportioned that there is leisure both for light reading, the study of nature, and for recreation; then there will be freshness and vigour in your work; and if you always aim above your mark, and remember that what you do should not only be for your own personal satisfaction, but for that of others and for future generations, your restful moments may benefit the world.

Then of much importance in connexion with the practice of the architect, as in all other businesses in life, there is another thing that must be borne in mind, and that is right principle. This in architecture will mean an avoidance of shams and false construction, which somehow always manage to look wrong, even though worked on such a grand scale as the external walls of St. Paul's, or the impudent ugliness of our shops with stone façades, apparently standing on nothing. Truth makes work look consistent and correct; lack of it offends good taste. Palatial decorations in offices, ecclesiastical embellishments in restaurants, the affectation of a cottage simplicity in a palace, or *vice versa*, imply a want of appreciation of the fitness of things, and are wrong in principle; and this element of truthful principle in architectural art should be carried down to the smallest detail, if the work is to live.

Then there should be right principle in your motive of action; and this is a most important point, if you desire not only your personal position to be respected by others, but also wish to uphold the dignity and status of your profession generally. Professional respect must ever depend on the character, conduct, and aims of the units in the profession. Each individual has his own particular influence on the appreciation with which his profession as a whole is viewed by the public. Dubious transactions entered into for the sake of emolument, a too great regard for personal advantage, or a disregard of the interests of others, tend to acts lowering to the profession. On this ground I would recommend due consideration before entering into competitions. See at least that the conditions are not derogatory to the dignity of a great profession, and see that they are fair as much in your competitor's as your own interests; and let no unworthy thoughts of possible interest or influence induce an activity which in the long run not only must be disadvantageous to you personally, but also detrimental to the profession as a body.

The highest principles of morality should be the guide in professional practice, not only in regard to art, but also in all dealings with employers, contractors, tradesmen, craftsmen, and others with whom business relations bring you in contact. Work cannot be obtained without employers, nor carried out without tradesmen and labour of all sorts, and your success is bound up with these; therefore it is to your interest to treat all with a high-minded, unsparring sympathy. The architect should, on principle, enrich his mind and render himself proficient in all branches of his work, as his duty to his clients, and should deal fairly and avoid harshness in dealing with those over whom he is set as supervisor.

A high principle in these directions would avoid much of the litigation and many of the unsatisfactory arbitrations so constantly arising. It wants a kindly spirit united to a firm will—the iron hand in the velvet glove—to perform all an architect's duties in the highest manner, and to render himself and his profession honoured and respected by the public and those with whom he has business. Always remember the words—

'Thy credit wary keep, 'tis quickly gone,
Being got by many actions, lost by one.'

and our reputations are the immortal part of ourselves.

Principle also should not only lead you to strive after success in your own practice, which is, of course, your high duty to yourself, but also to aim at helping others who may have less experience or knowledge than you have, and thus assist in elevating your profession. With this view you cannot interest yourselves too much in the work of this Institute, whose

objects are to encourage the art of architecture, to uphold the interests of the profession, and improve its status. This obligation will be best served by a large-minded way of looking at all sides of thought, and by cultivating broadness of views in our art of architecture, with a proper consideration for the sentiments of others, and not by the pushing forward of any particular school or clique.

In combination we are strong; separated we are comparatively weak. There is room in this Institute for all architects who are capable and honest in their views and endeavours, and the wider the circle of thought it enrolls, the greater the sphere of its influence will be, and the more it will foster education and dispel ignorance, and maintain the reasonable humility that should distinguish all those who claim to be artists; for, as Prior says:—

'By ignorance is pride increased:
They most assume who know the least.'

Mr. J. A. Gotch, F.S.A., then read a criticism of the designs and drawings recently submitted for the prizes and studentships. Mr. Gotch, in the course of his remarks, said that the Pugin Studentship was perhaps the most fascinating of all the prizes offered by the Institute; 'for it is earned, not by laborious plodding in a dull office, not by a consideration of dreary formulas, or a study of the wants of man in his various capacities as the user of a club, or a stroller in a park, or a foot-passenger desirous of crossing a stream, but in delightful journeys from one village to another, either in our own richly-endowed land

'Or by the lazy Scheldt or wandering Po'

journeys in which every sketch has its own memory—the quiet of a country church, the gloom of a castle guard-room, the rain pattering on lead roofs, the sun drawing shadows across lichen-covered walls, amid the scent of old-fashioned flowers and the hum of the distant reaper. That is how the Pugin is earned, and it is spent in a more systematic prolongation of the same delights. Yet, after all, the Pugin is only a means to an end. Its object is not merely to make young men facile sketchers, but to lead them, through the observation of the work of the men of old, to do their own better.'

In referring to the Soane Medallion, he said: 'This great increase in the number of designs submitted is very gratifying; we may conclude that it indicates among students an increasing interest in their work. Whether it also implies an increasing slackness of work in the respective offices to which they are attached I do not know. We may also say that with the increase of numbers the number of fairly good designs has proportionately increased. It is not merely the fringe that is longer, but the garment itself. At the same time, so far as the Soane is concerned, the increase has not produced the master-hand; and this competition must be pronounced disappointing on the whole. It is no secret that the reason which led the Council to withhold the medal was the absence of a really good plan; and it is of the utmost importance to impress upon young designers the vital necessity of a good plan. There was more than one design in which the plan was sacrificed for the preconceived necessities of the front façade. As a matter of fact, neither plan nor elevation should be preconceived; they should grow up together. It is quite as much from the influence of modern life upon the arrangement of our buildings as from the introduction of new materials that we may look for the characteristics of a latter-day style. It should be borne in mind that the money prize accompanying the Soane Medallion would represent a very fair premium even in a competition for an actual building; it is, therefore, worth taking as much pains for as if the Soane building were actually to be erected; and to perfect the designs of an important building actually to be erected, no pains are excessive. But there is about the Soane competition an absence of enduring responsibility which surely ought to stimulate the imagination and prompt young men possessed of all the freshness and daring of youth to embody some of the lofty ideals which they must have conceived. Do we find much daring originality among the twenty-two designs submitted this year? I can hardly say we do. It is true that out of that number there are seventeen or eighteen which might be built without materially decreasing the sum of human happiness, so far as their external appearance is concerned. But is there

one which could be regarded, even by the most enthusiastic, as epoch-making? However, we cannot reasonably expect a new epoch to be started every year, and although, from this particular point of view, my remarks may have been disparaging, yet, if we apply a more ordinary standard, there is something to gratify us in nearly all the designs."

Proceeding, he said: "I must take the opportunity afforded by these remarks on students' drawings to protest against the affectation already mentioned as being prevalent among certain draughtsmen. It affects the accessories chiefly: skies are made to look like masses of telegraph wires, or are divided into parallel strips of dark cloud divided by thin regular lines of sky; figures are introduced hard and badly drawn, imitating the unpleasant style of Aubrey Beardsley. Sometimes the building itself suffers: coarse lines obliterate all delicate detail—and it should be borne in mind that very often 'thick lines hide thin designs'—or the elevation and perspectives are put in with quivering, hard-drawn lines. These are only some of the forms which affectation takes—and occasionally with the hope of attracting attention which would never be bestowed upon the design itself. All such devices ought to be eschewed by a broad-minded student. But let no one be discouraged by finding that he is not so expert a draughtsman as his neighbour. Drawing and designing are by no means interchangeable terms, and a study of the lists of past prize-winners may not only gratify the prize-winners of to-day, but go far towards comforting unsuccessful competitors with the thought that though their names do not appear on any of those lists, they may, nevertheless, be ultimately written in some corner of the scroll of fame."

The President then presented the prizes and certificates gained in the recent competitions. Mr. H. W. Cotman was introduced as Pugin Student for the year, and the Medal of Merit was presented to Mr. J. Forbes Smith, and a Certificate of Hon. Mention to Mr. A. J. Pitcher. The following presentations were also made:—

Tile Certificate and 30s.—Certificate to Mr. Walter Fairbairn; Prize of Ten Guineas to Mr. Ralph Knott; Certificate of Hon. Mention to Mr. W. A. Mellon.

Grissell Gold Medal and 10l. 10s.—Medal, &c., to Mr. Edwin Forbes.

Ashpit Prize, 1000—Books, value 10l., to Shirley Harrison, Ashpitel Prizeman; Cheques value 5l. 5s. each, to Mr. C. H. F. Conyn and Mr. C. E. Varnell.

Owen Jones Studentship, 1899.—Certificate to Mr. John Stewart.

Pugin Studentship, 1900.—Pugin Medal to Mr. James McLachlan.

Essays.—Institute Silver Medal and Twenty-five Guineas to Mr. A. Maryon Watson; Certificate of Hon. Mention to Mr. W. Curtis Green.

Measured Drawings.—Institute Silver Medal and Ten Guineas to Mr. Lawrence L. Bright; Medal of Merit and Five Guineas each to Mr. A. Wyatt Papworth and Mr. H. F. Trayley.

Souane Medallion.—Prize of Thirty Guineas each to Mr. H. M. Cautley, Mr. M. J. Dawson, and Mr. J. B. Fulton.

Owen Jones Studentship and 100l.—Mr. Hervey Kutherford was introduced as Owen Jones Student, 1901; Medals of Merit were presented to Mr. Percy E. Nobbs and Mr. Ramsay Traquair, and a Certificate of Hon. Mention to Mr. E. H. Bennett.

Mr. John Slater, B.A., proposed a vote of thanks to the President and Mr. Gotch for their remarks.

Mr. Aston Webb, A.R.A., seconded the motion, which was agreed to.

The President having briefly acknowledged the vote of thanks, the meeting terminated.

MESSRS. WOOLLAMS & Co.'s SALE.—The established business of Messrs. Wm. Woollams & Co., carried on for some years past at 110, High-street, Marylebone, together with the extensive stock of hand and machine-made wall paper, printing blocks, machinery, and trade fittings, with the goodwill of the business, was offered for sale at the Holborn Restaurant on Tuesday last by Messrs. Frederick Miller & Reid, of Clement's Inn. The result of the sale was that Lot 1, comprising the trustee's interest in the business, trade fittings, machinery, and goodwill, realised 1,900l. Lot 2, which comprised the leases of the premises, was not sold, in consequence of the same being somewhat heavily charged.

THE SURVEYORS' INSTITUTION: THE PRESENT CONDITION OF THE BUILDING INDUSTRY.

An ordinary general meeting of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, Sir John F. Rolleston, M.P., Vice-president, presiding.

The minutes of last meeting having been read and confirmed and some donations to the Library having been announced,

The Chairman said he thought it was becoming to refer to the great loss the Institution has sustained by the death of their chief clerk, Mr. Bennett. He was sure all the members would fully recognise Mr. Bennett's good qualities—his unvarying courtesy to members and his many years of devoted service to the Institution. He (the Chairman) was sure they would all join with him in expressing to the widow and son deep sympathy and regret in their loss.

This having been agreed to in silence, Mr. Thomas Blashill then read a paper entitled "The Present Condition of the Building Industry."

After some preliminary remarks, Mr. Blashill said he would begin by insisting upon one radical difference between the crafts which make up the building industry and the class of solitary trades or manufactures. It was likely that he who was first to foresee the usefulness of a house had to design and build it for himself. It would be the realisation of a single, simple, complete idea. But however complex the idea of a house may have now become, and no matter how many of us may be employed over it, it was still a single and complete thing that was wanted, our separate contributions towards it being useless if they stood alone. It was their combination that gave them value. The architect, the mason, and the carpenter were by no means to be looked upon as so many isolated artists, like the statuary, the potter, or the coppersmith. Unless each worker should understand his fellows and look beyond his own department to the scheme as a whole, if any should act stupidly or inactively, or if they should quarrel among themselves, it was not one particular part of the building that would be damaged, and it was not a particular class that would suffer, but the whole. Before considering the details of our various arts and crafts, and the arrangements for their harmonious working, it might be well to give some thought to him who sets all to work, but who, standing outside this co-partnership, was, perhaps, in danger of being overlooked.

In a building contract he was styled the employer, a term which was wanted for the builder or contractor in relation to the workman; but the client was really the employer of them all. It was he who felt the want of a building or judged it prudent to spend his money in that way rather than in some other. He was the source of all fees, wages, and profits. When his purse was full and open we were busy and prospering; when it was shut we stood idle in the market place. He (Mr. Blashill) was decidedly of opinion that the client was entitled to more consideration than he commonly receives, and it was not certain that even the architect, who was nearest to him, always understood him so well as he ought.

Many of them could speak from sad experience of the difficulty of getting from a client his real meaning, and so embodying it in drawings that he thoroughly understood what he would get for his money. But this had to be done, and no pains were too great to ensure it. Otherwise the client might want to alter the design as soon as he saw the building begun. A good model would be helpful to him, interesting and stimulating to everybody, and instructive even to the architect himself. Insufficient estimates, designs that had to be cut down, or designs that were defective and had to be supplemented, were the fruitful seeds of trouble between all parties and no credit was to be got out of them. Upon this subject there was an admirable letter, that all young architects should read, from John Wilson Croker to Decimus Burton when, as a young man, he was carrying out the Athenæum Club, and had suggested some desirable improvement. He pointed out that, good as the motives might be, few would hear the arguments, while all would see the extra charge, and that a young architect could hardly have a worse reputation than that of one who exceeds his estimates. An

architect, of whatever age, who had that reputation was likely to be one with whom contractors as well as clients are dissatisfied.

If the building was simple and alterations were avoided, or if it could be easily supervised from the office, the clerk of works might not be necessary; otherwise he was indispensable. To an experienced foreman this post was usually the only promotion to which he could aspire. But it should really be promotion. To pay a man in a position so highly responsible no more, or even less, than a builder's foreman was unwise. Yet with all that had been done for the artisan little was heard about better pay for the clerk of works.

Notwithstanding what he had said and had yet to say about the client, one must remember that the architect must act fairly between him and the contractor. There were many persons who, whether in their private capacity or as members of public bodies, thought it fair to take every advantage of a contractor and expect the architect to assist. In view of such a contingency it was important that the contract, which was usually stringent enough as regards the contractor, should be incapable of being used unfairly against him. He (Mr. Blashill) need not insist on the delicacy and the difficulty of the position of the architect, who had to act impartially between two parties, one of whom was his employer and paymaster.

It was very important to see that none but builders of good reputation were allowed to tender, and not too many of them. Corporations usually advertised for tenders, and although they might reserve power to reject, it was practically impossible to convince a committee on the clearest evidence as to the unsuitability of a builder if his tender was the lowest. A grasping client would endeavour to take the same course, but the architect should make all possible resistance.

"To get a good tender from a trustworthy builder, three things," proceeded Mr. Blashill, "seem to be specially necessary—to make it perfectly clear what he will have to do and how much he will get; to avoid hampering him with troublesome restrictions and conditions; and so to draw the contract that he shall not fear the application to himself of clauses that are meant for a builder of another sort."

In order to make clear what the contractor has to do, and also to enable him to go on with speed, it is now highly desirable, if not necessary, to prepare full detail drawings before any step is taken to procure a tender. This involves delay at an early stage, and it may be said that the old plan of making out details during the progress of a building in such order as they seem to be required is enough. But the modern system of building requires that the contractor should get in prices of materials and should prepare for his manufacturing processes at the earliest possible date. It is very disturbing to a contractor if he is kept waiting for details till the architect thinks he wants them. A quantity surveyor will tell you that if he has then to work from both speed and correctness will be facilitated. I am assured by a leading contractor that if he can have all the details on signing a contract he will finish a job in half the time. Although this looks like an exaggeration, I am convinced that, so far at least as it relates to those parts of a building which are capable of being hastened, he is not very far off the mark.

I shall have more to say about the possibility of speedy construction, but here I will urge the immense importance of it to contractor and client, and also to the architect. A client as a rule does not want his building twelve months or even nine months hence—he wants it now. For work not speculative the money is generally waiting at poor interest or is within easy reach. The money gain to a contractor in interest, freedom of his workshops, in supervision, and by getting his work quickly finished is enormous. And if the architect can finish his part of the business straight off, while the thing is fresh, so that it is done before he and the client have time to change their minds, that is perhaps the clearest gain of all.

It is worth while for the architect to choose such materials and methods as will make for speed, and to clear his mind of the idea that everybody is expecting him to invent new features, even new mouldings and fastenings, irrespective of their advantages and of his client's willingness to pay the enhanced bill. It is a duty to others as well as to himself to

avoid orders, for variations which are confusing to the contractor's staff are the chief obstacle to the settlement of the account, and give the enemy—and even the friend—occasion to blaspheme.

In my time, the old practice of leaving it to the builders to select the quantity surveyor has given place to selection by the architect, the builders being at liberty to decide, from what may be known of the person selected, whether they can safely accept his quantities as representing the work drawn and specified. A private client of moderate means may have to be protected from the chance of paying more money than he can afford, while he has got no more than the building agreed to be built. It is no comfort to him to be told that the quantity surveyor has made a mistake, or that in settling up the job the contractor has got the best of certain arguments on doubtful points. Many clients have been seriously crippled through such means, or have even had to sell the building that they had hoped to occupy. It is the contractor's business to contract; he is a capitalist who can appreciate his risks and protect himself or stand the loss. But in the case of a public body and of all such clients as are able to run a risk that is very seldom serious the quantities should form the basis of the contract, and, if reasonably priced, should be the basis for settling the accounts.

Sub-letting by the contractor is properly discountenanced when there is danger of his losing control of the work or bringing upon it a person whom the architect may have reason to distrust or of lowering the quality of the work. It should be watched and kept within bounds.

There is, on the other hand, the very risky practice of introducing into a contract a great number of special works for which the architect has made arrangements with other parties whose tenders he puts down in the specification, stipulating that the general contractor shall adopt those parties as 'sub-contractors' under him, and pay them the amounts of their tenders. Serious misunderstandings arise out of this practice.

In such cases the contractor complains that by nominating a particular person with whom he must deal the architect deprives him of the advantage of bargaining as to price and of dealing with the firm he usually employs, and there is a group of objections and risks that may arise through the presence upon a building of the sub-contractor's workmen. But the architect acting for the client must be the person to select and to decide in the case of certain accessories and of certain artists or workmen whose employment cannot safely be left to the contractor's judgment either as to questions of quality, skillful workmanship, or price. I hope that the conditions of contract now under discussion between the Institutes of Architects and Builders may put this matter on as good a footing as is possible in the circumstances (I am sorry to say, from what I have heard to-day, that the prospect is not so good); but I suggest that the items of a contract needing special treatment should be reduced to a minimum. If they are very small in relation to the whole undertaking the contractor is not likely to object to them, and as to such as are left, the contractor should have a reasonable opportunity of making his profit. This, in large matters, is a source of great difficulty.

When in a specification I provided 1,000*l.* to be paid to a sub-contractor for iron construction, and suggested that those who tendered should add their own profit, I found that the tender which was the lowest included nothing for profit, and that the contractor delayed payment in order to get from the sub-contractor 10 per cent. in addition to the usual cash discount. When I added to the provision too, so that the contractor should take that as his profit, I found that he had struck the item so added out of the quantities, and was delaying payment with the same object as before. Although this could be put right by paying the so-called sub-contractor direct, there remained the disagreeable fact that the general contractor went without profit, and as he was not a philanthropist any more than I, there was planted a root of bitterness that we could have well spared. If you buy and pay direct for any large quantity of these special materials, leaving the contractor to charge for fixing only, he will miss the profit which he thinks he ought to make on the materials, and it is a question whether either party has reason to be satisfied.

If the architect has taken pains to go to such sources of information as manufacturers' price-lists and showrooms, trade advertisements, and building exhibitions, he ought to know what he wants, and may be able to select alternative specimens, so that the contractor may make the best bargain he can between them, so long as a lower class article is not substituted by the manufacturer for the sake of a low quotation. I had a lesson through specifying a first-class article at a price which I believed to be that which would be payable to the maker. The builder was anxious for the substitution of other goods that were manifestly inferior, alleging the unreasonableness of the manufacturer nominated in the matter of discount. But this person produced evidence that he had offered a discount of 52 per cent. besides the usual discount for cash. I quite believe I had been allowing the full price, with 10 per cent. profit.

I am told that the secret of trade lists with their discounts cannot be penetrated by the architects, and the system cannot be altered. If that be so, we should cut the knot by demanding to know at any time from those who send price lists and offer their goods for our choice their lowest price to a safe cash customer. If this is inconvenient to anybody, the architect should take the ground that things must be made convenient to him. The worst feature in the system of large and varying trade discounts is that they furnish a fund out of which 'secret commissions' can be paid to persons ordering for the client particular goods. I am not sure how far such practices can escape the law, but they are strictly prohibited amongst reputable architects, and the offer of them to a young architect is a snare that ought not to be set. The best course is to let the contractor make or buy and fix every article that can safely be left to him. As to the very large and increasing item of ironwork, we have much need to keep pace with engineers in experience and technical skill. It is best to have the ironwork details calculated and completely worked out in the office, and to let the contractor make the best arrangements he can as to their supply, subject to tests that can very easily be applied. But a large contractor can buy his materials and make up his girders on his own premises. As iron construction supersedes timber construction, a builder's yard will be more occupied by smiths and less by carpenters. A modern builder's yard should be less of a storage place for bulky materials, and ought to be more of a factory. Whether that shall come to pass depends on considerations which I shall invite you to discuss.

There are two more questions arising out of the ordinary routine of work under a contract that must be considered—the faithful execution of the work contracted for and, if alterations have been unavoidable, the final settlement of the accounts. A contract is a business document, legally binding. The specification with the drawings should set out clearly what is to be done. If these are vague there will be disputes, and if a contractor who stands to lose should take all possible advantage of this vagueness nobody need be surprised; but when there is no reason to doubt the 'true intent and meaning' of the specification, to try to evade it by submitting materials of inferior quality or by omitting things set down to be done, is a proceeding the immorality of which should be better understood. The contract is not to do so much of the work as by sharp inspection the contractor can be made to do, nor to supply materials as near to the quality specified as he is obliged to supply; but unless the contract is lawfully modified, to do the very thing set down to be done. A stranger may walk into any shop in any civilised country at random, buy goods, and order them to be sent to his hotel, and, except through misunderstanding or accident, the parcel will contain the number or weight or the length and the quality ordered: otherwise it is fraud. No respectable contractor will put his responsibility lower than that. One who is perpetually trying to shirk his responsibilities will be found out and dealt with accordingly.

The settlement of accounts under a contract affords much legitimate opportunity for discussions on details, with reasons offered on behalf of the contractor why extra works should be treated in one way rather than another so as to increase the charge, and arguments as to the proper prices to be allowed for items outside the contract. But these admissions afford no excuse for throwing dust in

the eyes of the surveyor, as by representing that things have been done that were not done or giving false information as to the things done. When such a procedure is mentioned to the contractor it is repudiated, and would not be done under his orders: that it is attempted at all may arise from too great responsibility for the result of a contract being devolved on assistants, who feel that for their own credit they must do all they can to make the job a financial success.

In such a complicated business there is great necessity for the more firm establishment of customs by which the representatives of both parties should be governed. If I ask different surveyors to define 'prime cost' I can get different answers. In a matter of daily routine this should not be possible; it makes the amount of the client's cheque depend not on what he gets in return for it, but on the skill or the pertinacity or the sense of honour of the parties arguing over the final account.

Extras that are occasioned by a changeable client who has been well warned may only be a nuisance to the architect and the measuring surveyor; it is the extra which comes of an ill-considered design or of some sudden inspiration of the architect apart from the client that gives real trouble. Double the time spent over the drawings and half the time over the building should annihilate such extras and would be a gain all round. But all changes act unfairly on the client unless the omissions are watched as narrowly as the extras. With extensive changes and a quantity surveyor bound no doubt to act fairly between two parties, only one of them being before him, a fair settlement is impossible.

I am not sure that without a special guarantee the legal responsibility of the quantity surveyor can be put higher than to do his best with reasonable care and skill. He is indispensable to the architect in a hurry, and his wider experience is always helpful. A specification written by him with all the information before him will be a clearer and more logical document than the architect would be likely to write, but he should not be entrusted with the responsibility of deciding upon everything that does not make for the beauty of the design. Although there is only one person between him and the client the chain that connects them is already too long. He cannot know as the architect ought to know precisely what is wanted and in pounds sterling how much it is wanted, but if, besides his ordinary duties in respect of quantities and the settlement of accounts, he will suggest easier or more efficient means of attaining the end which the client has in view, his influence will be salutary.

The general contractor, as we know him, appears to have been evolved in the first quarter of the last century. The brothers Cubitt are credited with the chief part in this, but in 1819 St. Pancras Church was undertaken by a general contractor, though there seems to have been much done apart from him. Though the old system of separate contracts worked well enough in small jobs, it was a clear gain to get a large and complicated building undertaken by one builder whose staff was under one control. The occupation of a builder is not so attractive that many men without habits and knowledge gained in the business are tempted to embark in it, but if the general contractor is not a practical craftsman he may be a good administrator who has learned enough of his business and is able and willing to keep his engagements. I do not care to choose between them. Both may grow together; their race has developed the builder of to-day, and he is developing the builder of to-morrow.

A modern builder on a large scale should have a fancy for machinery and be ever ready to seize on improvements. His steam-engine will probably drive the dynamo, but the gas-engine will not be despised. Instead of the rattle and friction of heavy chains there is the swift, smooth-working wire rope. His stone is sawn, squared, and elaborately moulded or turned while the modern mason looks on. His moderate stock of timber comes in of any scantling he may order, clean and dry, and fit for high-speed machines. The piece that is going into the shops passes straight through the machine, and will come out with its four sides moulded or grooved, or sunk, or planed complete. Then, after careful markings, morticing and tenoning are an affair of seconds, and all the parts of the framing come together where the joiner awaits them with his wedges

and glue-pot, he being literally and practically a joiner and nothing else, unless he should possess the skill of a fixer as well. His box of tools, once prized, with which he wrought and moulded, is now seasoning at home for a place in some industrial museum. The workshops are warmed and lighted as comfortably as the office, and as building materials in general are amongst the cleanest things to handle, the workman may, if he likes, keep himself as tidy as the clerk.

So far as is practicable these improved conditions of labour in the shop are getting applied on the building. I am not sure how far this is due in London to our native smartness, or how far to the example of Scotland and the North or to the pertinacity of American inventors. I have usually seen either in Scotland or abroad a new invention for saving labour years before it gets on our building sites. As I was looking over a large establishment newly fitted with American machinery, the inventor called to take home his final cheque. Daring a polite farewell his customer said, 'I suppose we shall see you back some day?' The Yankee replied promptly, 'Yes, sir, I shall be here in the spring with my new system of machinery, which is calculated to entirely supersede this of yours.'

In discussing the English builder of tomorrow it is impossible to ignore the work of the American builder of to-day, who is a constructional engineer. In the recent Paris Exhibition models were shown of a tall office building in New York, only one of many now going up in all the larger American cities. The dimensions and records of progress are full of interest. It stands on a corner plot, nearly 100 ft. by 50 ft., and has eighteen stories above the street, not more—some have twenty-two.

The lowest visible stories are in handsome granite work, the highest stories are in elaborate terra-cotta, coloured and enamelled. The builders of it wax enthusiastic as to its artistic character. The time spent in foundations was what they consider rather long, but once above the plinth they made amends. Would it be about fair to say that, with us, a first-class City building might rise at the rate of one story in three weeks? This New York building shot up through its ordinary and plainest stories at the rate of one story in three days, or two stories per week. In the artistic lower and upper stories the rate cannot have been much slower than one story per week; and all this was done in the winter months of November, December, and January. This speed was made possible by their system of skeleton steel construction, filled in and faced with more costly materials. I have details of other tall buildings erected at only twice or three times our pace.

Our Institution has lately provided itself with this handsome building. If our neighbours had no rights of light and air, and we had desired to rehouse the whole of the firms cleared away from this vicinity as well as ourselves, the American building first mentioned might have been duplicated here. It would have risen from the pavement to its present height in less than a month, and would have gone up square and solid 225 ft.—as high as the tall pinnacles of the western towers of Westminster Abbey—in a total period of fifteen weeks; and, I suppose, the internal fittings, with the complicated heating and ventilating apparatus, steam engine, electric plant, and express lifts, would have been finished complete in three months more. I am not advocating these methods. The persons who are carrying them out in America are anxious to try them here, so we may wait and judge for ourselves. I mention this and many other subjects for forethought, not for prophecy.

If we desire to know whether our present arrangements, by which the architect prepares the drawings and the contractor executes the work, are entirely satisfactory to the client, we have not far to seek. There have always been builders able and ready to advise the client as to the design and to carry out the structure. One of these maintained an office, with a staff of architectural draughtsmen, who were in fact architects. Royal Osborne was one of the products of this organisation, and the practice is not becoming less common. If you go to the estate department of one of the general providers to inquire about a house you may learn that they carry out repairs and additions, inspect and renew drainage and build new houses from their own designs, while their staff of assistants may be four times as large as that of average London architects.

There is no reason to think that the work is done especially badly, and if the builder or the architect should object to this system they might be asked whether they buy everything at old-fashioned shops or take advantage of the stores. They would find no sympathy outside their own circles, but if they would gain anything out of such a lesson it may show them the good policy of combined efforts to save time and trouble to the client.

We have been considering the details of business under the contract system, but the system of building upon a schedule of prices is adopted on a considerable scale and may be getting more prevalent. One would have thought that in the making of a bargain of that kind without competitive tenders the client would be at a disadvantage, but I know of cases in which prices so arranged have been materially lower than any that could be got by open tendering. Two or three years ago, when brickwork was at its highest, it was being done cheerfully on schedules of prices by more than one firm of good standing at two or three pounds per rod less than the lowest prices in competitive tenders, and at several pounds per rod less than the price at which a builder of great experience showed me that such work was costing him. I shall try to account for this under another branch of the subject.

One of the useful products of times comparatively modern is rather curiously called the speculating builder. We know of speculators in stocks and corn, and have heard of the land speculator. These buy or sell simply with the view of making money by a rise or a fall in a fluctuating market. But this builder, whose object is no doubt similar, proceeds, often with great skill, to acquire land, buy materials, organise labour, and produce a house for the customer whom his sagacity foresees. He is a manufacturer and a merchant. We do not talk of speculating cabinet-makers and speculating hat-makers. He who, with sufficient command of capital, carries on this business honestly is no speculator in the ordinary sense. Nowadays he buys, not a field, but a farm, makes roads, studies the requirements, the tastes, and the means of his customers, and is distinguished for the excellence of his plans. His elevations are up to the latest architectural craze—in fact, 'art' elevations. He gives the authorities no trouble, pays rather more than the standard rate of wages, turns out his houses, not in groups, but by long roads at a time, and will let on long or short terms or sell outright. If he injures anybody, it is the architect, who, suffering in silence, may be left out of account.

The man who, with nothing to lose, gets hold of sites, is financed, runs up houses that just escape the meshes of the law, mortgages, sells, and is gone, is the jerry-builder. For him building laws are primarily made and are always too lax. Their greater stringency would be a protection to men against whom they are not required.

I approach the subject of the building operative, conscious that it will cover a space large, but not too large, for him who, alone amongst us all, brings into visible shape the things for which his collaborators are content to design and arrange.

Looking back, as I do, just fifty years, when, in a district charmingly remote, I was entrusted—perhaps prematurely—with the oversight of works where, without any sort of machinery, every kind of building material had to be raised from the quarry or felled in the wood, and seasoned and converted for use, the boards and quarterings laboriously planed and grooved, and moulded and mortised with resounding blows—when during hours of labour that were long and for wages astonishingly low the masons and joiners turned out their work with a perfection of finish that modern machinery can do no more than imitate, I can realise the contrast between the old style and the new.

I have always been impressed with the skill of these artificers in stone and wood, the truth of their joints, the perfection of their angles, the beauty of their finished surfaces, the rarity of mistakes in their setting out and of material cut to waste. No architectural draughtsman has such a task before him, or need strain after their exceeding accuracy. Accomplishments such as these were the result of long apprenticeship and the constant handling of well-sharpened tools. After many years spent then and since in direct communication with men of this class I am conscious that, however well we and they may understand each other for

purposes of business, we may get no better qualified to enter into their thoughts and feelings. Between us and them there is built up a barrier stout and high. For some of us it may be getting lower, but there it remains.

I remember, long ago, sitting on a bench encouraging a friendly joiner to develop some grievances that he had hinted against the system of which he was a helpless part. One of them has always stuck in my memory—his scorn of the employer, a large builder, who had never done a day's work in his whole life, who was always rushing about in his carriage trying to get financed, and who went off with all the profit on the job. It may have been profit or loss, but I knew that the brougham was used also in looking after the materials on which the joiners were exercising their skill, in finding work for them that they could not have found for themselves, and in visits paid to the architect, in order to convince him that these men had done rather more work than appeared by my weekly returns. I asked why do not you and your mates undertake all this work for yourselves and share the profits? I dare say his reply was conclusive from his point of view, but I gathered that, in his view, if everybody had their rights the finished building would belong to them as the makers of it all.

I might have suggested that, much as they were doing to it, they had not quarried the stone, nor felled the timber, nor hauled or stored the materials, nor brought them to the job, nor paid for the ready-made accessories, nor made the design, nor organised the labour, nor found the capital, nor stood the risks of actions or losses. And yet for fully twelve months before the building could produce to anybody profit or comfort they had week by week been furnished punctually with the means of living, whether other contributors to the result were paid or not. He would probably not have seen the point of this, and in his place I might not have seen it, but it is at least an element worth a moment's thought in the wide subject which we have so little time to discuss.

After all, they were really making or manipulating a large proportion of the items and putting them together, skillfully as I have said, and looking at the lengthened chain of responsibility, passing through so many hands, between the client and themselves, if any of the parties should fail to understand the other, or if the result should not turn out quite so well as had been hoped, the wonder may be that things were no worse. For the barrier that divides them from so many of us is serious; it is not difference of birth, nor of education, nor of social status, nor of dress, or hours of rising, or of mere hand labour or rate of pay. It is the practical fixity of their position without reasonable expectation of betterment while craftsmen; with little hope of getting out of their groove and with no assurance of a comfortable provision against old age.

The whole tribe of clerks or assistants, down to the boy who fetches and carries, is paid by time at wages often no higher than those of the workman, but from the day they enter their calling they are cheered with prospects of promotion which, though seeming to recede at times, will in the ordinary course of events, with age, industry, experience, and good manners, come within reach, and may bring any of them to the highest position in the scale. But if, at the age of manhood, the clerk, or assistant, or office boy should see that he was encompassed by a dead wall over which, in ordinary routine, he could never climb, through which he could never break, no matter how he might grow in age or strength or grace, he would look upon his position as that of a serf, and if wise and energetic he would get out of it into the free air by whatever road. If slow of thought or unlucky, he would sink into the chronic grumbler against fate and circumstances. For the burden of servitude does not gall by its weight and composition so much as by its deadly hopelessness. I have seen such men in such positions, and I know. But if there were to be these last just one loophole open in the prospect of better pay, is there any reason to doubt that, either alone or in combination, they would use every effort to scheme and contrive as these workmen do towards their ideal of life on a higher scale? "

* The remainder of the paper will be given in our next issue.

Illustrations.

PART OF A TAPESTRY PANEL.

HIS illustration is from a fine water-colour drawing by Mr. Hervey Rutherford, forming a portion of the drawings for which he obtained the Owen Jones Studentship this year.

It is a portion only of a composition representing the adoration of the infant Jesus. The original work is Flemish and of early sixteenth century date.

DESIGN FOR FAÇADE OF A MILITARY MUSEUM.

The illustration is of a drawing hung in the Royal Academy Exhibition, 1900. The design and details of the façade are intended to convey as clearly as possible the nature of the building—viz., a museum in which the military relics of a nation might be preserved.

J. E. SPAIN.

DESIGN FOR LEAMINGTON FREE LIBRARY AND TECHNICAL SCHOOLS.

This design was submitted in a limited competition in May, 1899, and was awarded the second premium. The building was to consist of a free library and science and art schools. The instructions to competitors were very explicit, and gave the approximate area of every room; the limit of cost was stated to be 12,000*l.*, exclusive of furniture.

The building, planned for a corner site, consisted of a central block with obtuse-angled wings, parallel with the adjoining roads. The library, in the east block, was arranged entirely on the ground floor, with main entrance from the principal road and staff entrance at rear. The central block comprised entrance to schools, cloakrooms, and stairs which gave access to the science and technical schools on the north-west and the art schools on the east, over the front portion of the library. The art schools were thus entirely lighted from the north, the small windows on the south front being provided for purposes of ventilation. A relief stair and emergency exit was arranged at the extreme north-west of the building. The caretaker's residence was placed on the upper floor of the central portion with separate entrance and stair.

Externally the building was intended to be faced with red brick up to the plinth level, the upper part of the walls being finished with "rough-cast" rendering with arches, and window aprons in red brick, and window sills, cornice, doorways, and dome in Hollington stone. The roofs were proposed to be covered with red Italian tiles. The drawing from which the illustration has been reproduced was exhibited in last year's Royal Academy Exhibition.

J. E. NEWBERRY.

THE HOMESTEAD, WOODBOURNE ROAD, EDGBASTON.

The aspect and view from the site necessitated the dining-room of this house being placed at the south-east corner, and the kitchens at the opposite diagonal corner, in order to be near the tradesmen's entrance and the separated out-offices in the rear, the difficulty of access between the two being got over by placing the pantry under the stairs. This position is found convenient for answering the front door. The hall is in communication with the dining and drawing rooms by wide folding doors, and when these are open an apartment 56 ft. long is obtained.

The house is finished with oak, Kenilworth stone fireplaces, some ornamental plaster, and metalwork. The whole of the external walls are covered with rough cast, the chimneys being built of old bricks and the roofs covered with Colley Urston stone slates.

The house is at the top of a sloping site, a series of terraces being formed with retaining walls of old bricks. Messrs. James Smith & Sons, of Birmingham, were the builders, and Messrs. Bateman & Bateman the architects.

THE GABLE HOUSE, KING'S HEATH.

This house was erected about five years ago upon a residential estate near Birmingham now being developed for this class of property, and adjoins a new station in course of con-

struction by the Midland Railway upon their line to King's Norton. Thin Leicester facing bricks, with Quilting stone of a yellow colour, are used externally, and Codsall stone of a red colour for the chimney-pieces internally. The roofs are covered with tiles of mixed colours, cleft oak boarding being used for the bay window and gabled over. The walls of the rooms are covered with panelling, and the ceilings are of open exposed timbers. The archway is useful for getting in and out of the carriage in bad weather and for the children to play under. The proprietor employed his own workmen, who were directed by Messrs. Bateman & Bateman, the architects.

COMPETITIONS.

JOINT ISOLATION HOSPITAL, DEVIZES.—A meeting of the committee for carrying out the Joint Isolation Hospital for the Urban and Rural District of Devizes, met at the Town Hall on the 21st ult. for the purpose of accepting the report of Mr. C. E. Ponting, the assessor who had been appointed to examine forty-five sets of plans sent in for competition, in response to an offer of two premiums of 20*l.* and 10*l.* Five sets of plans were selected, and the committee awarded the first premium of 20*l.* to "Hygiene II." (Messrs. E. C. Isborn, Devizes, and G. Boughton, Woodlands, Ryde, Isle of Wight). The second premium of 10*l.* was awarded to "G" (Messrs. Bell, Withers, & Meredith, London). Three other sets were accepted, in reserve, viz., "Efficiency" (R. W. Goodman, Reading); "Esculapius" (R. J. Brinkworth, Chippenham); and "Deviser" (H. H. Clark, London). The committee agreed to accept the second premiated set of plans as being most likely to come within the amount they wished to spend.

SEVENOAKS ISOLATION HOSPITAL.—There were forty sets of plans sent in in this competition, in which Mr. Keith D. Young, F.R.I.B.A., acted as assessor. The premium was awarded to the plans signed "Lucidity," by Mr. W. H. Ansell, A.R.I.B.A., 11, Great James-street, Bedford-row, W.C. The Urban District Council has endorsed the assessor's award, and the hospital—with certain omissions and modifications—is to be proceeded with at once.

BOARD SCHOOL, VICKERSTOWN, BARROW-IN-FURNESS.—A competition was recently held at Barrow-in-Furness for a Board school to be built near the growing suburb of Vickerstown, on Walney Island, for the Barrow-in-Furness School Board. The competition was open to local architects only, and Mr. Thos. Bell, of Burnley, was appointed the assessor. He placed the plans of Mr. H. T. Fowler, architect, of Ramsden-square, Barrow-in-Furness, first, those of Mr. J. Y. Macintosh second, and those of Mr. W. Moss Settle third, and the decision has been confirmed by the Board, who have appointed Mr. Fowler their architect to carry out the work. The school is to provide accommodation for 600 children, including temporary accommodation for 180 infants, who will be removed to a separate infants' building as soon as the requirements of the district necessitate the increased accommodation.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A meeting of the Leeds and Yorkshire Architectural Society was held in the society's rooms, Park-street, Leeds, on the 18th ult., when a paper was read by Mr. H. C. Corlette, of London, on the "Planning and Design of Churches." Mr. Corlette said he did not propose to discuss doubtful points in ecclesiastical architecture, or the history of churches, but to address to practical men a few practical remarks upon their planning of the building with which their interest as architects was especially associated. In the first place, he pointed out with some emphasis the necessity of the building being made to belong to and to harmonise with its surroundings, and he proceeded to advise architects not to put too much egotism into their composition. Let the personal element be found rather in their work than in an ostentation amounting to vulgar display, which forced its recognition upon the notice of all who looked at the building. Proceeding, he offered some advice with regard to the selection of sites and the adaptation of the buildings to their surroundings; and he went on to deal with the technical

features of plans, such as those relating to the construction of the sanctuary, the choir, the nave, the side-chapel, and the vestries.

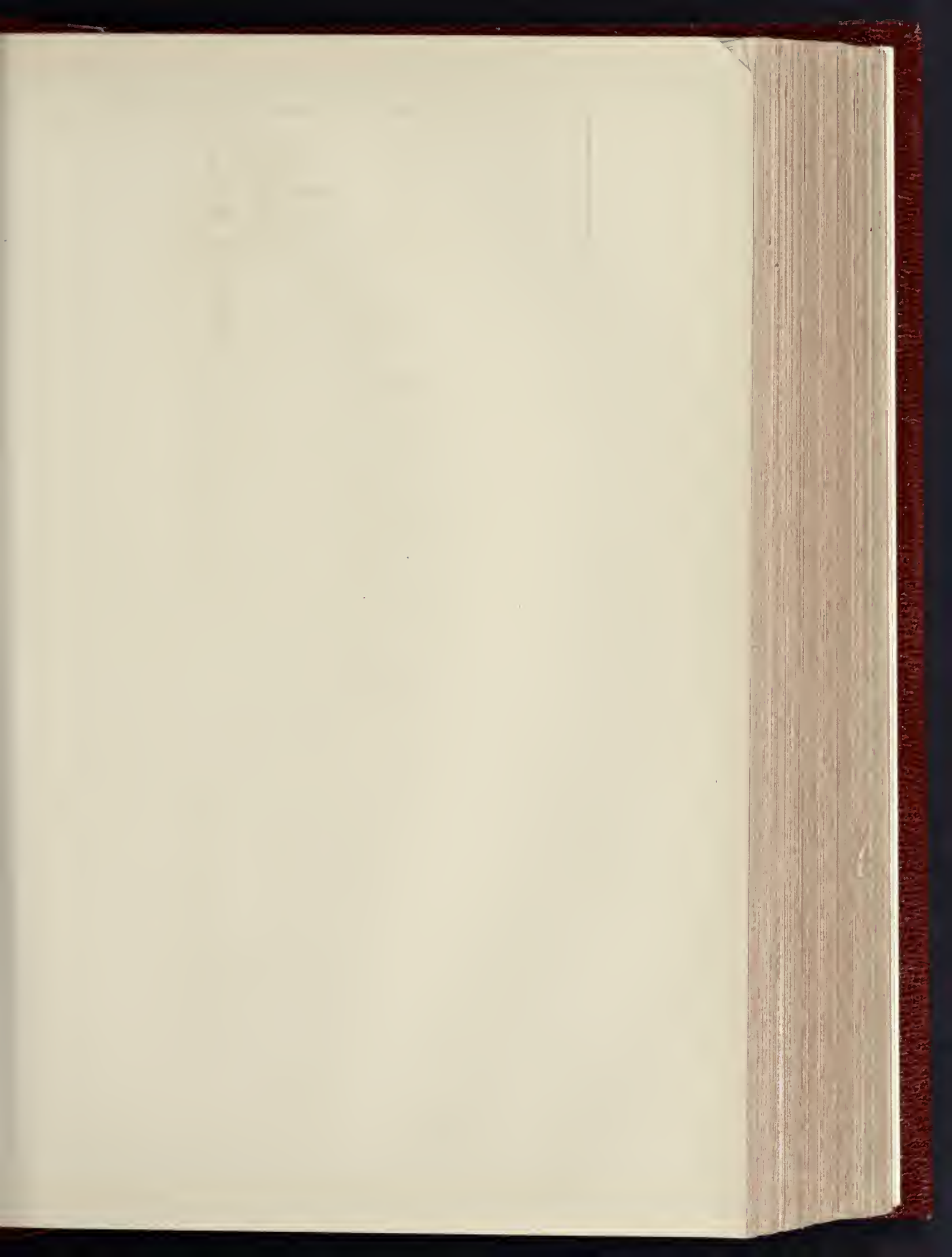
ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on the 20th ult., Mr. S. W. Kershaw, M.A., F.S.A., presiding, when an interesting paper was read upon "Some Old Halls in Wirral," by Mr. W. Ferguson Irvine, who illustrated it by many fine photographic views shown by the limelight lantern. The Hundred of Wirral possesses many special characteristics, due mainly to its peculiar surroundings and situation. Wirral, or "Wurrall," as the old natives call it, is the tongue of land lying between the estuaries of the Mersey and the Dee, and contains the only coast line which the county of Cheshire possesses; it is, in fact, a peninsula, being connected with the rest of the county by one narrow end. The halls and manor houses of Wirral differ in many respects from the rich examples of domestic architecture for which Cheshire is so celebrated; nevertheless, they are not without quaint and picturesque features. One peculiarity about them is the half-timber construction, which is confined entirely to the frontages, the rest of the walls being of masonry. In Bidstone Hall we have a good specimen of the style of architecture of the early seventeenth century, the house being built in 1620 to 22. In the deer park is still standing an old wall over 6 ft. high and about 4 ft. thick built of rough stones, which is referred to in almost every lease of the Hall as far back as 1609 as "the great stone wall"; its antiquity may be much greater, as tradition records it was built when wages were a penny a day. The wall is popularly known amongst the villagers as the "Penny-a-day Dyke." Chief amongst the buildings described and illustrated were Leasowe Castle; Storeton Hall, connected with many memories of the historic house of Stanley, dating from about 1360, and architecturally a good example of the fourteenth century; Shotwick Hall, and the partly timbered houses of Irby, Hooton, and Plessington. A somewhat unusual feature of these old halls is that not one of them can boast of having been the residence of a king or queen, yet the histories of many of them, as told by the lecturer, were romantic and interesting.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The second Lecture of the series on "Works Management" was delivered by Mr. A. H. Barker, Wh.Sc., B.A., B.Sc., at the Westminster Palace Hotel, on the 20th ult. Mr. Ernest King, Vice-Chairman of the Institution, presiding. Continuing the discussion of carrying and lifting appliances introduced in the first Lecture, hand-cranes, ordinary power cranes, and cranes worked electrically were considered, the relative economy in working being pointed out. Their cost was treated, as also that of radial cranes, both hydraulic and hand. Trucks and rails in the shop and railway sidings were dealt with. The lecturer then passed on to the essential features of the foundry; and considered the cost of cupolas, and foundry lifting and conveying appliances. Moulding machines of various types were described, and the relation of the number of moulders and labourers to output was entered into. The appliances of the brass foundry received attention, particular reference being made to the crucibles. General arrangements of various works were reviewed, the most advantageous positions of the different departments being shown. The systems appertaining to the tool-room and stores were touched upon, and questions with reference to heating, ventilating, and lighting discussed. Further information on the points raised in the Lecture was given by Mr. Barker at the close, in reply to various questions put to him. The third Lecture takes place on the 7th March.

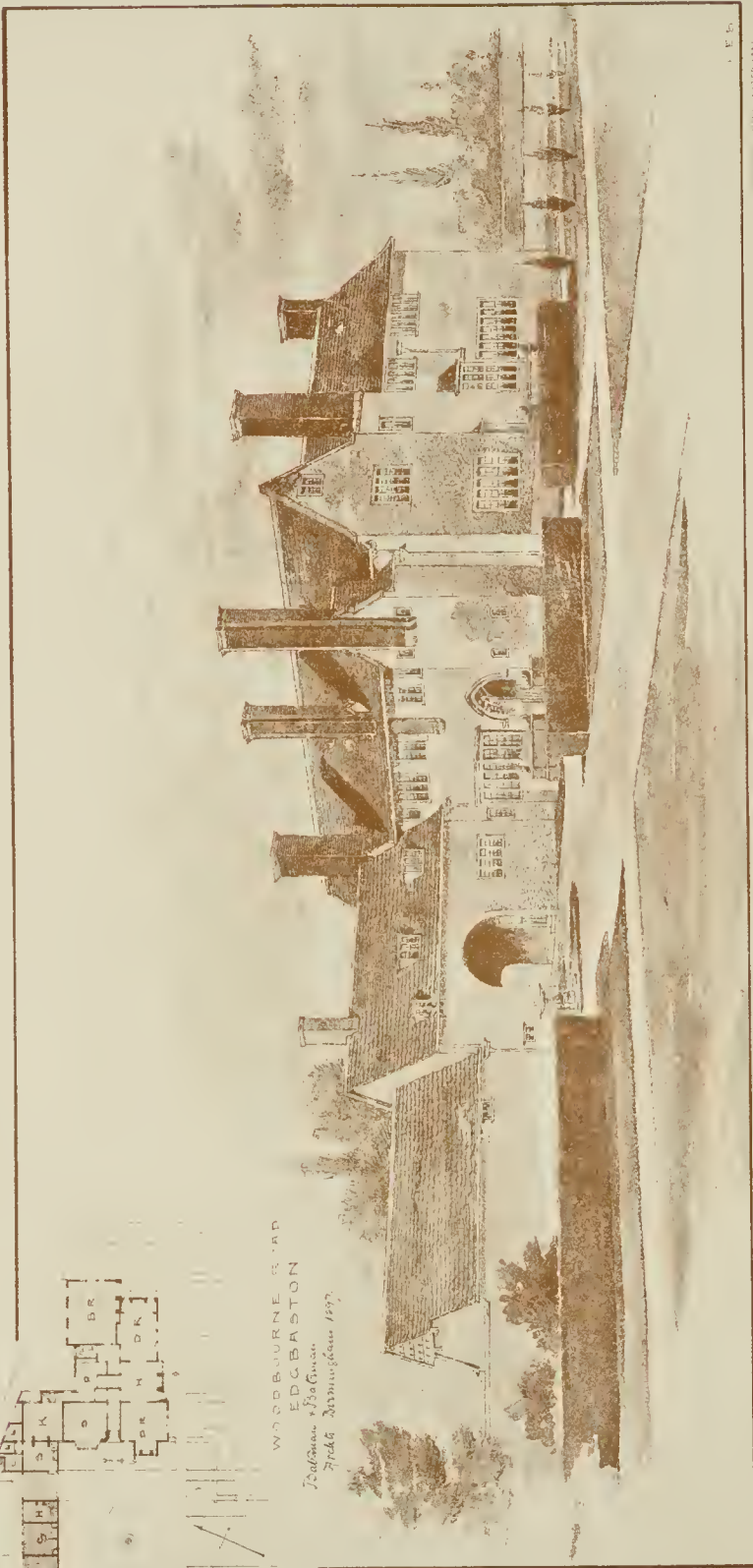
NEW LONDON FIRE BRIGADE STATIONS.—The new fire-station in Redcross-street, City, was opened on the 23rd ult. The station contains an engine-room 33 ft. by 47 ft., watch and recreation room, a basement for laundry and stores, and the quarters for the men.—The fire-station which has been erected in Uxbridge-road, Shepherd's Bush, was opened on the same day. The building is of red brick, and the cost has been 12,600*l.*



THE BUILDER, MARCH 2, 1901



WOOBBOURNE ROAD
EDGBASTON
Joubert & Co. Architects
7, Abchurch Lane, London, E.C. 4.

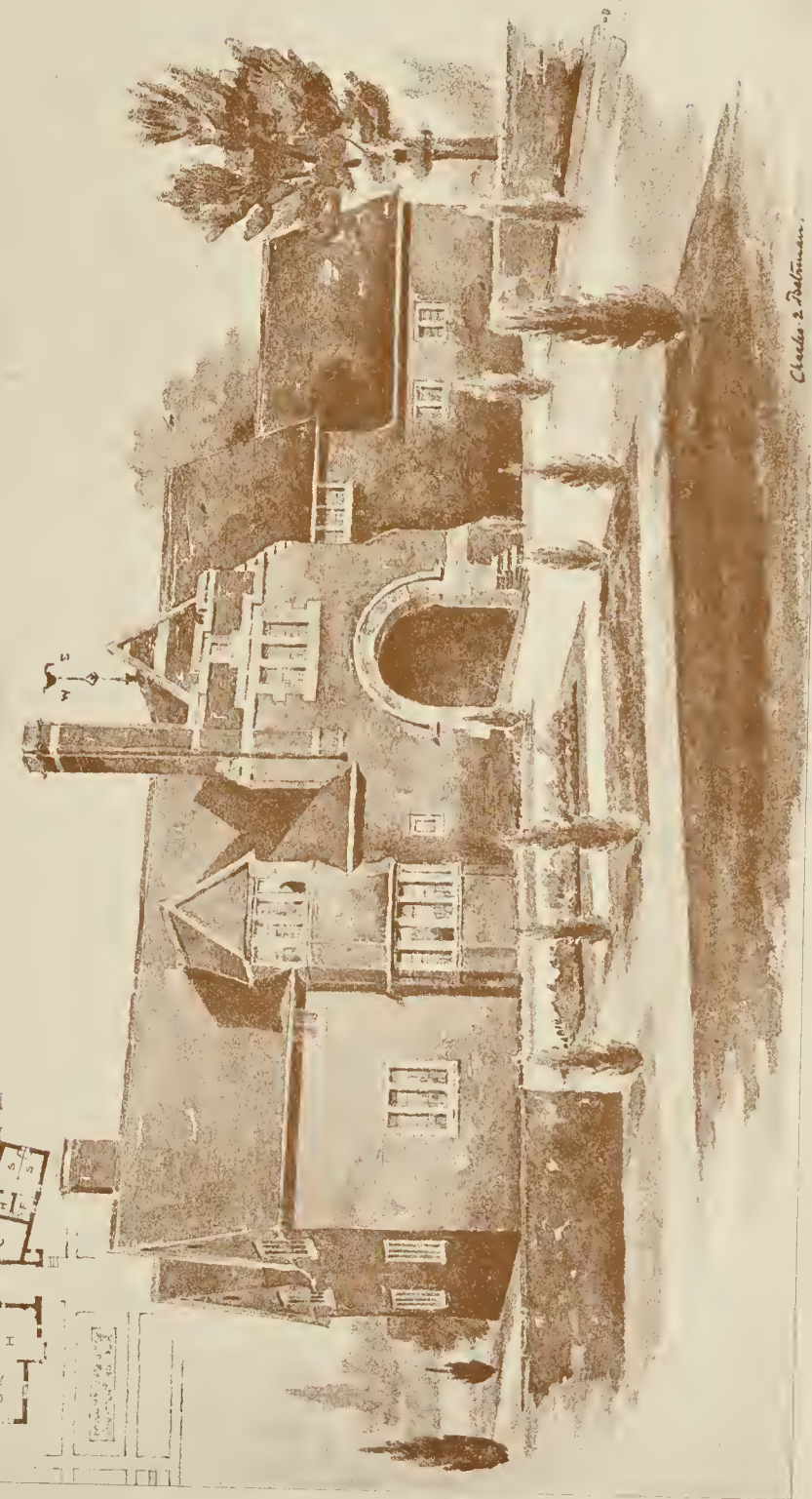


J. E. B.
J. E. B. (repeated)

THE CABLE HOUSE KINGS HEATH
WORCESTERSHIRE.

*Bateman & Bateman,
Architects, Oct. 1896*

SCALE
0 10 20 30 40 50



Charles & Bateman

1/4 " EAST HANDING " SHEET PETER LANE, 1



THE LONDON COUNTY COUNCIL.

The last meeting of the present London County Council was held on Tuesday in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Battersea Borough Council 10,600*l.* for electric light installation; the Kensington Borough Council 2,748*l.* for the extension of the town hall; the Stepney Guardians 1,845*l.* for erection of boiler-house at the workhouse; and the Metropolitan Asylums Board 18,316*l.* for purchase of land and erection of buildings.

Wandsworth Park.—The Parks Committee recommended and it was agreed, that the estimate submitted by the Finance Committee be approved, and that an expenditure of 12,500*l.* be authorised for the embankment and laying out of Wandsworth Park, including the provision of campshedding along the river front, the supply and erection of iron boundary railings next Putney Bridge-road, the erection of conveniences, both, cart shed, tool shed and temporary bandstand, the provision of three watch boxes, and the execution of the necessary ground work; and that the Parks Committee be authorised to invite tenders and enter into any necessary contracts for the supply of materials or execution of work.

Tender.—On the recommendation of the Highways Committee, it was agreed that the tender of the Stirling Boiler Company to supply, for a sum not exceeding 22,782*l.*, the boilers and mechanical stokers required for the electricity generating-station, to be erected by the Council at the Camberwell tramways depot, be accepted.

London Government Act, 1890—Transfer of Powers.—The Building Act Committee reported as follows, the recommendation being agreed to:—

"By the provisions of the London Government Act, 1890, the power hitherto exercised by the Council under Section 84 of the London Building Act, 1894, to license the setting up of wooden structures, and the power to take proceedings for default in obtaining, or observing the conditions of, a licence under that section, are transferred to the Metropolitan Borough Councils constituted under the first-mentioned Act. There is, however, some doubt as to what constitutes a "wooden structure" within the meaning of Section 84 of the London Building Act, and a question has arisen with the Council of the City of Westminster as to whether temporary wooden stagings put up on public occasions, such, for instance, as stagings erected in connexion with the opening of Parliament, and on other recent occasions, come within Section 84 of the Act as "wooden structures," or within Section 83 of the Act as "structures of a temporary character." The City of Westminster contend that they come within Section 84, whereas the solicitor advises us that, in his opinion, they do not, but come within Section 83. We have been in communication with the Local Government Board upon this and other points of difficulty arising upon the transfer of powers under the London Building Act, and a reply has been received stating that the Board have no jurisdiction to determine the question, which is rather one for the decision of the High Court in accordance with the provisions of Section 29 of the London Government Act, 1890. We have now received a letter from the Council of the City of Westminster, stating that they have resolved to at once take the necessary steps for the submission to the High Court of the questions raised. We recommend—that the solicitor do take all necessary steps for supporting before the High Court the view of the Council that structures or erections put up on public occasions do not come within the provisions of Section 84 of the London Building Act, 1894."

Office Accommodation.—The Establishment Committee proposed to let on lease the ground-floor of 25, Cockspur-street.

Mr. Pigott moved, and Sir J. B. Maple, M.P., seconded, an amendment to refer the matter back until the special committee had reported on the site for the new county hall.

The amendment was lost, and the Committee's recommendation was accepted.

After transacting other business, the Council dissolved.

The new Council, which is to be elected on Saturday (to-day), will assemble on Tuesday week. Meanwhile, the Committees will continue to hold office until March 8.

SHUTTLEWORTH MEMORIAL TABLET, EGLOSHALE CHURCH, CORNWALL.—A memorial tablet to the late Professor H. Shuttleworth has just been unveiled in Egloshale church. The tablet, which was the work of Messrs. Hems, of Exeter, covers an urn containing the ashes of the late professor.

THE ARCHITECTURAL ASSOCIATION:

FIRST SPRING VISIT, FEBRUARY 16.*

Mr. BENTLEY'S Westminster Cathedral is in many ways the most interesting building in progress in London, and the Association was wise in selecting it for one of their periodical visits.

Up to the present time it is only possible to gauge the ultimate effect of the interior by studying the proportions and the general lines; but from the point of view of construction the visit was opportune, as in several instances the centering for and the filling in of the vaulted aisles could be readily followed.

Since the previous visit of the Architectural Association considerable progress has been made, especially as far as the Cardinal's House is concerned. The general drawings of the cathedral only were on view, and, though these were of great interest, it would have been of assistance to the members if the drawings of the Cardinal's House and other departments of the scheme could have been exhibited showing the working of the whole plan.

The assembly hall, with its barrel vaulted ceiling, is the most notable feature of the building, apart from the cathedral; it is placed in a position accessible to the public and also to the residential and working departments.

In a few isolated cases marble columns and caps were in position in the choir and nave, but a considerable period must yet elapse before the building assumes any appearance of finality.

The exterior is in every way a remarkable study, the effort to obtain grandeur being fully realised. The tower, which is becoming a familiar monument, is approaching the final stages, and grouped with the whole building there is a dignity in the square mass which is unusual and entirely satisfactory.

At a future date it is hoped that the Association will again have the opportunity of visiting the building.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The sixth meeting of the Discussion Section of the Architectural Association for this Session was held at 56, Great Marlborough-street, W., on the 22nd ult., Mr. C. H. Strange, Chairman of the Section, in the chair. The paper of the evening was entitled "Domestic Heating, Ventilating and Lighting," by Mr. Fredk. J. Osborne Smith. Mr. Osborne Smith called attention to the fact that high temperatures were detrimental to health and were often the cause of lung trouble. He then pointed out the importance of making the most use of the aspect when planning a house, of keeping the outer walls as thick as circumstances would permit, and of guarding against the prevailing habit of using too much glass in the form of windows, thereby increasing the cooling surface of the room.

The ventilating grate was suggested as being very suitable in living rooms, inasmuch as fresh air could be warmed and introduced not only into the room, but also into the bedroom over, care being taken to divide the air chamber into two parts. He advocated warming the hall and staircase as well as the rooms, either by a grate or radiator, which latter should be placed near the entrance door; in addition to being warmed they should be thoroughly ventilated. In small houses a single radiator might be worked off the hot-water service if convenient, and would be found economical and efficient, stop-cocks being provided to shut it off in summer. Independent warming is advantageous, but requires extra attention, although it is a great convenience to be able to keep a country house warm and dry when not being occupied by means of radiators or pipes judiciously placed under windows and in corridors. Slow combustion grates with fire-clay backs and sides were recommended for warming, inasmuch as they saved fuel and ventilated the rooms, besides being more cheerful than stoves.

Considering ventilation, Tobitt tubes were condemned as being filthy and antiquated. The author preferred Sherringham ventilators placed near the ceiling in such positions as would favour a cross current. Ventilators, he said, do not always act as outlets, and this should be borne in mind when deciding the

position for them. In conjunction with these ventilators deep sill fillets for double-hung sashes and fanlights for mullioned windows were advised.

Lighting was briefly dealt with, mineral oil lamps being suggested as a very pleasant light. Electric light was considered expensive, but as possessing many advantages, although many found it harmful to their eyes.

Mr. F. G. W. Buss opened the discussion and proposed a vote of thanks to the author for his paper. Mr. Ernest King seconded, and the discussion was continued by Messrs. R. H. Weymouth, J. H. Pearson, L. S. Crosbie, G. Lee, A. Gray, and C. H. Strange.

Mr. Osborne Smith having replied, the Chairman announced that the next meeting will be held on March 13, when Mr. H. P. G. Maule will read a paper entitled "The Architect and the Garden."

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

The annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held in the King's Hall, Holborn Restaurant, on Saturday last week under the chairmanship of Mr. B. I. Greenwood (who presided in consequence of an accident to his partner, Mr. Jas. S. Holliday, who was to have occupied the chair), supported by Messrs. Banister F. Fletcher, C. Dunch, R. B. Marsh, H. O. Ellis, C. Wall (President of the London Master Builders' Association), Howard Colls, S. B. Depree, L. F. Maton, A. Kibby, A. Roberts, and T. Costigan, the company numbering 334.

The toasts of "The King and Queen and all the Royal Family," and the "Navy, Army, and Imperial Forces," having been honoured (Mr. Thomas Costigan, Secretary of the London Master Builders' Association, responding for the "Navy, Army, and Imperial Forces").

The Chairman proposed the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works." The Institution, he said, had distributed during the past year the sum of 390*l.* to the needy and necessitous, and who could measure the good that had been done, and how many lives brightened, by the judicious distribution of even such a comparatively small sum as that? The Institution had many good rules, one of which was that no clerk of works should be admitted who did not know a trade. He appreciated that rule, for he had had some experience of clerks of works, and he said without hesitation that the worst clerk of works one could have to deal with was the man who did not know his trade—the man, for instance, who was sometimes sent out from an architect's office to act as clerk of works. There was no man more difficult to please than the man who did not know what he wanted. The Institution was one to which all clerks of works and foremen should belong, and he was glad to say that some of the foremen in the employ of his firm were members of the Institution, and he thought they all ought to be. He was inclined to think that if all the foremen engaged by his firm would become members of the Institution, the firm would be very pleased to pay half of their subscription. Why not all? some might say. Well, he believed in helping a man to do a thing, but he did not believe in doing it all for him, and that was his reason for objecting to the Workmen's Compensation Act. It was a good thing that a workman in case of accident should be supported during the time he was prevented from proceeding with his ordinary avocation: he should be helped, but not have it all done for him, otherwise he became a pauper. Builders' foremen and clerks of works came more directly into contact with the workmen than did the employer; and no doubt they had noticed the great and growing danger which threatened the commercial prosperity of the country: he referred to the persistent and systematic limitation of output. There had never been in the labour history of the country any more pernicious or abominable system than that of refusing to do what a man could very well do, and ought to do, if he had the will, and, unfortunately, that system prevailed in almost every industry. If they wanted to know why British trade was diminishing, and why foreign competitors were getting trade that used to belong to us, they would find the cause in the limitation of output he had referred to. The work that was now done for

* Unavoidably postponed from last week.

a fair day's pay was nothing like that which used to be done. Moreover, the employer was not now able to say what he wanted; all he could now say was what he would like to have. No doubt things would improve, but the sooner the better. The Institution had been able to carry forward a balance of 209*l.*, which was a very satisfactory thing. The expenses of administration were very small, and much of the work that was done by the officers of that Institution must be regarded as honorary work, for the amount of their remuneration was very moderate.

Mr. John Beer, secretary, replied, remarking that the past year had been one of steady progress for the Institution. A larger amount had been paid to pensioners than had ever been paid in one year before, and a larger sum put to the reserve fund. But there were many members who were in the evening of their life, and the funds of the Institution might have a heavy call on them at any time. Two years ago the amount of the pensions had been raised, and it was hoped to still further increase the amount, giving the men 18*s.* per week, and the widows a sum that would at least pay their house rent.

Mr. Howard Colls then gave the toast of the "Architects and Surveyors." He referred to the very high standard English architecture had attained to during the last years of the Queen's reign, and said that some of the work that was now done would compare very favourably with the work of the past, and, in his opinion, it would last longer, because it was built better, than the buildings of past times. What was wanted in the erection of a building was good fellowship, from the highest to the lowest, combined to produce first-class work. The responsibility of all connected with building work remained to remind them of it, and that showed how important it was to strive to do the best work.

Mr. Banister Fletcher, who responded, said architects had a good deal to learn—amongst other matters, how to insure the erection of halls like the King's Hall suitable for hearing in. But there was so much to learn, and an architect was supposed to know so much, that it would be necessary to live much longer than one usually did before a man could be thoroughly master of his profession. As they could not do that, they had to rely to an extent on men in the trades allied to architecture, and on builders' foremen and clerks of works, and to them architects were specially indebted. As to the chairman's remarks in regard to trades-union policy, he might say that in the United States a man worked as hard as he could, not as little as he could; whereas in this country the idea which some workmen seemed to be to work as little as possible and get as much pay as possible. For a man to be told that he must not lay more than a certain number of bricks per day in order that a man round the corner might have the benefit of it, was not a system which ought to have the support of the British nation. In the United States a man did get better pay than a man here, but he did twice the work. The system in this country greatly added to the cost of building, which was becoming almost prohibitive on that account.

Mr. Fletcher then proposed the toast of "The Builders and Contractors," remarking that the prosperity of the builder was linked with that of the architect. The lot of the modern builder and contractor was clearly not a happy one, for he had to contend, amongst other difficulties, with various labour disputes, and such matters as the price of materials which were continually being brought into the market, and the complicated matter of extras and omissions. Speculative and jerry builders were, he believed, a product of the present wants of the age, and were as necessary as the more respectable builder and contractor. It had occurred to him that an Institution like the Builders' Foremen's Provident Institution might have obtained quarters at Carpenters' Hall, and he was quite sure that the Carpenters' Company would be glad to give them accommodation which would probably be an advantageous matter to the Institution in the way of rent. With the toast he coupled the name of Mr. Charles Wall.

Mr. Wall, in reply, said that Mr. Fletcher was quite right in saying that a builder had many difficulties to face, but if they wanted to know the real difficulties of a builder they should become a President of the Master Builders' Association. In that capacity he had

had several attacks of conciliation. Mr. Wall then spoke of the difficulties which had existed as to which trade should do certain work. He felt that the time had arrived when those men who could do the work best should undertake it, and further that the builder ought to know better than any one else what trade should carry out certain work. The builder to an extent was in the hands of the architect, the clerk of works, and the foreman. Good builders tried to pay the highest wages they could, for after all it was not so much a matter of wages as a question of how much work one got for those wages. It was absolutely necessary, if building was to be continued in England as it ought to be, that the cost must be materially reduced. That was not to be done if the builder continued to be overruled by trades unions, and it was for any builder's foreman or clerk of works who belonged to a union to consider whether he would serve the master or the union. He believed that men could not serve two masters. Builders did not want to deprive their men of any benefits they might be getting from a trades union, but it was most important that a builder's foreman should be a servant of the builder, and not of the trades union.

Mr. J. Stapleton (treasurer) proposed the toast of "The Governors and Trustees" (Messrs. F. H. Dove, H. Colls, and J. Greenwood); "Donors and Honorary Subscribers and Visitors," coupled with the name of Mr. J. C. Hill, President of the Institute of Clayworkers. Mr. Hill suitably responded, and enumerated the qualifications necessary for a builder's foreman and the difficulties the builder's foreman had to contend with.

Mr. F. Hann then proposed the health of the Chairman, and Mr. Greenwood, in reply, said that in regard to trades unionism he might mention a good retort to a man who once said he did not do too much work in order to make a job for another man. "Yes," said the workman's friend, "and I'll tell you where that man is. It is quite true you are making a job for another man, but he lives in America, and when he gets the job he will keep it."

The last toast was that of "The Press," coupled with the name of our representative. During the evening subscriptions to the amount of 16*5*l.** 10*s.* 6*d.* were announced, including 2*1*l.** from Mr. J. S. Holliday.

A NEW ALTERNATING CURRENT ARC LAMP.

THE Reason Manufacturing Company, of Brighton, exhibited last week at the Croydon Electricity Works a new type of arc lamp invented by Mr. Frank Lewis. Mr. Lewis is well known in the electrical profession as the inventor of an alternating current arc lamp suitable for "parallel" running which is extensively used. The new lamp which he is bringing out is suitable for "series" running, and will probably come into extensive use for street lighting. At the Croydon works there were twelve lamps on view exhibited in series on a thousand-volt alternating current circuit. Some of the lamps were hung on poles in an adjoining field, and others were exhibited in the test-room, so we had the opportunity of inspecting them under various conditions.

The mechanism of the new Lewis lamp is extremely simple and is very effective in action. The principle is to shunt the alternating arc by a choking coil, so that the failure of any arc has practically no effect on the rest of the circuit. A clause in the specification states that even when 30 per cent. of the arcs are extinguished the remainder must continue to burn perfectly in series. The lamps exhibited passed this test successfully, as there was no perceptible flicker in the other lamps when two of the arcs were broken.

The lamp is of the enclosed type—that is, the carbons glow in a small glass globe, which prevents oxygen getting access to the arc. One effect is that the carbons consume away very slowly. The carbons in a Lewis lamp will last seventy hours, whilst in an ordinary "open" arc lamp they only last ten hours. This effects not only a considerable saving in the annual bill for carbons, but a still greater saving in the cost of maintenance, as one trimmer can attend to four times as many lamps. Another effect of enclosing the arc is to distribute the light much better and to make the quality of the light approach sunlight more nearly.

The voltage across the terminals of each

lamp is 70, and the current they take is about 7 amperes. Mr. Lewis has noticed the curious fact that the more alternating current arcs we have in series the greater the voltage they require between their terminals. The product of the volts and the amperes is only about 20 per cent. greater than the watts taken by the circuit, and compares favourably with the best results hitherto obtained in series arc lighting. This apparent discrepancy between the true watts and the apparent watts can be considerably reduced by supplying a "balancing" current in parallel with the circuit, and the inventor showed us several methods by which this could be done.

No claim is made for any very high efficiency in converting the electric energy into light energy. From the central-station engineer's point of view, the most important points in connexion with any system of arc lighting are immunity from breakdowns and small cost of maintenance. These are far more important considerations than economy in first cost or very high "light" efficiency. In our opinion the Lewis series system fulfils these two essential requisites, and as two sets of thirty-three of these lamps are already ordered for lighting along the tramway routes at Croydon, central-station engineers will soon have an opportunity of inspecting these lamps in actual work.

THE HOUSING OF THE WORKING CLASSES.

THE Report of the Housing of the Working Classes Committee of the London County Council, containing the following paragraphs, was received at Tuesday's meeting of the Council, with the exception of the part relating to the Tottenham scheme, which was postponed:—

Reid's Brewery Site, Clerkenwell.

"We have had under consideration plans for the development of the Reid's Brewery site, Clerkenwell, which was acquired by the Council for the provision of accommodation for persons to be displaced by the formation of the new street from Holborn to the Strand. The site has frontages to Clerkenwell-road, Leather-lane, Portpool-lane, and Gray's Inn-road. The plan which we have approved, and which has also received the approval of the Secretary of State, provides for the erection of five-story block dwellings all round the site except on the frontage to Gray's Inn-road, where the existing buildings will remain for the present. These dwellings will be pierced with six archways up to the second floor, giving access to the interior of the site. There are also two existing archways of the site. The main interior of the site will be occupied by five-story transverse blocks of dwellings divided by yards and gardens. The narrow end of the site next Gray's Inn-road will contain another short block of five-story dwellings, and the remainder of the site between this block and Gray's Inn-road frontages will be laid out as a playground and garden. An estate office and twenty-three shops will be provided on the ground floor of the dwellings facing Clerkenwell-road and Leather-lane. The accommodation will consist of 551 tenements, of which only thirteen will be associated and the remainder self-contained. The thirteen associated tenements all consist of one room; there will be 361 two-room tenements, 130 three-room tenements, and 41 four-room tenements. Accommodation will be provided in all for 2,614 persons, exclusive of the shops. We have received from the architect the working drawings for three of the interior blocks of dwellings, and have given instructions for bills of quantities and other particulars to be prepared. We propose that the course adopted on the Millbank estate of having a number of blocks erected under the same schedule of prices shall also be followed in this case.

Seymour and Somerset Buildings, Churchway, St. Pancras.

We report for the information of the Council that working drawings are completed for Seymour and Somerset Buildings, Churchway, St. Pancras. These dwellings are to be erected on the two sites on the east side of Churchway on the land acquired from Lady Henry Somerset under the London (Churchway, St. Pancras) Improvement Scheme, 1895. Each block will be five stories in height, and accommodation will be provided in 100 tenements for 472 persons. These tenements will all be entirely self-contained, and will comprise one tenement of one room, sixty-six of two rooms, twenty-nine of three rooms, and four of four rooms.

Tottenham Fields Estate, Tooting.

On January 23, 1901, the Council decided to acquire under Part III. of the Housing of the Working Classes Act, 1890, an estate at Tooting, consisting of about 38½ acres, and known as the Tottenham Fields Estate. The financial and other par-

particulars which were then submitted showed that the estate could be successfully developed by the erection of cottages. Since that date we have had under consideration the details of various methods of development, but it has been a matter of some little difficulty to frame a scheme which should comply strictly with the Council's general requirements as to working-class dwellings, and which at the same time should avoid putting too great a number of cottages on the estate. We are now in a position to inform the Council that we have approved a scheme of development which successfully meets both these difficulties.

The particulars of this scheme are as follows:— Three lateral streets run eastwards from Tooting High-road straight through to Church-lane. The middle one of these three will be 45 ft. wide, and the other two 40 ft. wide. A short 40-ft. street connects the southern of these lateral streets with the middle one, and from this short transverse street a fourth lateral street, also 40 ft. wide, runs straight through to Church-lane. Three main 45-ft. streets divide the estate transversely, and are so arranged as to provide for their continuation on the development of the adjoining land. All the 45-ft. streets will be lined with plane trees, which will be planted just inside the forecourts of the cottages abutting upon them. The forecourts abutting on the 45-ft. streets will be 14 ft. in depth, and the forecourts abutting on the 40-ft. streets will average 5 ft. in depth. The arrangement of roads outlined above enables the whole estate to be divided into 1,244 plots for the erection of cottages of four different kinds. The average sizes of the plots will be as follows:—

	Area in square feet.	Frontage.	Depth.
First-class cottage plot	2,494	fr. in.	ft. in.
Second-class cottage plot	1,104	33 8	74 0
Third-class cottage plot	799	10 0	72 9
Fourth-class cottage plot	1,210	12 2	66 0

The minimum distance between the streets will be 103 ft. and the maximum will be 158 ft. The distance between the backs of the houses will vary from 35 ft. to 90 ft. The cottages will be arranged in terraces of about eighteen cottages to each terrace; and between these terraces will be a space of about 15 ft. None of the cottages will have back additions, and the free circulation of air will therefore be unimpeded. The accommodation provided will be according to the following schedule:—

Cottages.	No.	No. of rooms.	No. of person provided for.	Average size of			
				Living room.	1st bed-room.	2nd bed-room.	3rd bed-room.
1st class.....	89	5 and scullery	290	150*	104	104	95
2nd class.....	109	3 and kitchen	654	158†	115	98	95
3rd class.....	818	3 and scullery	4,998	144	96	96	—
4th class.....	188	3 and scullery (upper flat) 2 and kitchen (lower flat)	1,128	130	96	96	—
Totals.....	1,244	—	8,532	—	—	—	—

* Parlour, 99 sq. ft. † Kitchen, 79 sq. ft. ‡ Kitchen, 60 sq. ft.

It will thus be seen that it is proposed to put 8,532 persons on an estate of about 38½ acres. This is an average of about 221 persons per acre. This may at first sight appear a high average when compared with the whole of London (57) but it must be borne in mind that the latter number of persons per acre is arrived at by including in the acreage land covered not with dwelling-houses alone, but with factories, warehouses, and commercial property generally, as well as all open spaces. The only fair comparison would be between the estate as proposed to be developed and an area of similar acreage exclusively covered with dwelling-houses. It will be seen that the proposed arrangement of the estate provides only two-story buildings, with gardens in the rear, abutting on 45-ft. and 40-ft. streets, and a 45 deg. angle of light to all windows is in all cases more than provided for, the maximum height of the cottages being only 17 ft. to eaves, and the minimum space at the back and front being 38 ft. and 50 ft. respectively.

From these facts the Council will understand that the scheme which we have adapted for the development of the Tooting-down-fields estate is one which can be thoroughly recommended on sanitary grounds. We have given instructions for the preparation of working drawings to be proceeded with or the portion—about one-third—of the estate nearest to Tooting High-road.

Clare Market, Strand, Scheme.

On February 12, 1901, the Council authorised us to advertise for tenders to be delivered to the

Council on 26th inst. for the erection of the dwellings on the Duke's-court site, Drury-lane, for the accommodation of 610 persons of the working classes to be displaced by the carrying out of the Clare-market, Strand, scheme. We now submit the working drawings, bills of quantities, specification, and architect's estimate, amounting to 26,285l. in respect of the three blocks of dwellings, which will be known as Sheridan, Beaumont, and Fletcher buildings. . . . The dwellings will consist of three blocks of five-story dwellings, which will provide accommodation for 610 persons in 130 tenements; of these ten will be of one room, seventy-five of two rooms, thirty-five of three rooms, and ten of four rooms; 120 tenements will be entirely self-contained, and the remaining ten will have private water-closets, but sculleries common to two tenements. . . .

Lordship-lane Estate, Tottenham.

In accordance with the decision of the Council to acquire land under Part III. of the Housing of the Working Classes Act, 1890, with a view to providing accommodation for the working classes, we instructed the valuer in May, 1900, to search for suitable sites for the erection of working-class dwellings in the north and north-west districts outside the county boundary. Inquiries were accordingly made, with the result that an estate at Tottenham, consisting of about 225 acres, was brought to our notice. The estate consists of two detached portions, the larger portion fronting Lordship-lane and the smaller portion lying to the north of White Hart-lane. As the estate appeared to us to be a suitable one for the purposes

of workmen's cottages, we instructed the architect to prepare a plan for its development. Upon the consideration of the plan submitted by the architect showing the development of a portion of the land, we instructed the valuer to communicate with the owners to ascertain the price at which they would sell a portion of the estate and alternatively the whole of the land. As a result of the negotiations with the owners' agent, we learnt that the owners would require a higher price per acre if

the southern site only were purchased. . . . The valuer continued his negotiations with the agent, and ascertained that 400l. per acre would be accepted on condition that the whole of the estate of 225 acres were acquired by the Council.

The estate comprises, as before stated, about 225 acres, and is six miles distant from London. The southern or larger portion of about 170 acres has a frontage of a little over half a mile to Lordship-lane, which is a main thoroughfare from High-road, Tottenham, to Green-lanes, Wood Green. It has also a frontage at its north-west end to White Hart-lane of some 650 yards. The northern or smaller portion of the estate north of White Hart-lane, containing about 40 acres, is about 440 yards distant, is detached from the southern site, and is approached by a narrow road, 30 ft. wide, from White Hart-lane. The means of communication between the greater part of the estate and London are good. The Enfield branch of the Great Eastern Railway would serve the bulk of the estate on the east side, Bruce-grove and White Hart-lane stations being respectively 850 and 580 yards from the nearest point of the southern site, while White Hart-lane station is 730 yards from the nearest point on the northern site. From both of these stations there are five workmen's trains running daily between 4.50 and 6 o'clock a.m. to Liverpool-street at a return fare of 2d., while there are three others between 6.35 and 6.55 a.m. at a return fare of 3d. The extreme west of the southern site is best served by the Palace Gates branch of the Great Eastern Railway, Palace Gates and Green-lanes stations being respectively 1,430 and 1,460

yards distant from this point. There are at present no workmen's trains from these stations, but the Council has prepared a case against the company for a service of workmen's trains on this branch. Wood Green and Bowes Park stations on the Enfield branch of the Great Northern Railway are within 1,040 and 1,800 yards respectively of the western end of the southern site. From the former of these stations there are eight workmen's trains between 4.58 and 7.1 a.m., running to King's Cross and Moorgate at return fares of 3d. and 3½d. respectively, while from the latter five trains between 4.58 and 6.58 run to the same stations at return fares of 3½d. and 4d. In addition to the railway facilities, trams run along High-road, Tottenham, within 800 yards of the eastern end of the estate, communicating with Moorgate-street, London Docks and Euston-road at a fare of 3d. In addition, and similarly along Green-lanes within 1,250 yards of the western end of the estate, The Middlesex County Council has also obtained powers to construct a light railway connecting the existing tramway at Bruce-grove, Tottenham, with that in Green-lanes, Wood Green, which will afford direct communication between the southern portion of the estate and these points. . . .

After careful consideration it appears to us that the northern site, which is less suitable for immediate development than the southern site, should not be dealt with until the southern site has been developed. The architect informs us that it could be developed to accommodate 2,400 persons in 1,029 cottages. The valuer also states that every house built and occupied on the southern site will tend to render the northern site not only more suitable for development, but also more valuable. The scheme of development, therefore, which we have had before us deals only with the southern site, comprising 170 acres. . . .

Accommodation for 33,000 persons will be provided in 4,750 self-contained two-story cottages, and 2,000 more will be provided for in tenements over shops. The cottages will be of various classes, and each cottage will have its own garden. The number of persons to be placed on the site will not crowd the land unduly. The depths of the various cottage plots will be generally greater than the by-laws of the local authorities require, and forecourts will in all cases be provided. The frontages to the main roads are very suitable for shops, and about 10½ acres of land will be given up to this purpose, upon which about 250 shops will be erected, and from these a considerable income could probably be obtained should the Council decide itself to build the shops. It will be necessary to widen Lordship-lane for the construction of the proposed tramway, and the shop plots have been made of sufficient depth to allow of this being done. Access to the site will be given by eight roads leading from Lordship-lane, Snakes-lane, and Hatherley-road on the south, three from Church-lane on the east, eight from White Hart-lane on the north, and provision will be made upon the other boundaries for future continuation of the roads should opportunity arise. The principal roads providing thoroughfares over the site, both east and west and north and south, are 50 ft. wide, with trees on each side, and the majority of the remaining roads are 40 ft. wide, with the exception of those within the district of Wood Green, which are in all cases 50 ft. wide as required by the Urban District Council.

It is proposed to take advantage of the river Moselle, which runs through the eastern portion of the estate, and some slightly rising ground upon its bank, which is difficult to build on, to arrange a public garden of about 2½ acres, with the river flowing through it. Four other smaller gardens will be arranged on other parts of the site, which will help to preserve the healthiness of the estate. The parish church of Tottenham and the church-yard are very picturesque, and effective use will therefore be made of them in laying out the estate. The total accommodation that can be provided on both sites is 42,500 persons in 5,770 cottages.

The estimated cost of erecting the cottages on the south side only, providing the roads, gardens, sewers, diversion of the river Moselle, &c., and provision of shops is 1,530,858l. On the other hand, the estimated sum available after allowing for the cost of the land, interest and sinking fund charges and all outgoings is 1,521,800l., or a deficiency of 9,058l. The difference represents only three-fifths per cent. on the total estimate. We may point out that 2 per cent. of the estimated gross rental has been set aside in the estimate under the heading of contingencies, and a very small saving under this heading will convert the deficiency into a surplus.

The Standing Order No. 336 (1)—(4) requiring that there shall be no charge on the county rate in respect of the erection of working-class dwellings applies only to schemes or areas dealt with under Parts I. and II. of the Housing of the Working Classes Act, 1890, and does not affect schemes under Part III. of the Act, but Standing Order 336 (5) relates to Part III. and only requires that the Finance Committee shall simultaneously report with us on the estimated financial effect of a Part III. scheme, and this will be done in the present instance. It may be mentioned that on December 6, 1898, the Council by resolution approved of action being taken under Part III. of the Act, pro-

vided that no charge be placed on the county rate thereby.

The amount of the estimate, which has been forwarded to the Finance Committee, and which the Council will be asked to approve, is 91,500l. This includes the value of the land, the agent's fee, and all expenses connected with the sale and purchase of the land. The sale of the estate is subject to the condition that the Council shall take over the land subject to the existing tenancies and tithes. The gross rental received from the agricultural tenants on the estate is stated to be 500l. per annum. The tithe and tithes rent charge amount to 65l. 17s. 11d. per annum normal, the value in 1899 being 43l. 19s. per annum.

The Committee recommend accordingly.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Projection.

Bermundsey.—The retention of a pilaster on the flank wall of No. 103, Southwark Park-road, Bermundsey, abutting on St. James'-road (Mr. E. Crosse for Mr. W. H. Hobbs).—Consent.

Width of Way.

Bermundsey.—A two-story office building on the north-west side of Upper Russell-street, Bermundsey, at less than the prescribed distance from the centre of the street (Mr. J. A. Stayner for Messrs. Onley).—Consent.

Woolwich.—A building at the rear of No. 1, Beresford-square, Woolwich, at less than the prescribed distance from the centre of Beresford-street (Mr. A. E. Parnell for Mr. M. Barnett).—Refused.

Lines of Frontage and Width of Way.

Kensington, North.—A block of studios on the site of Nos. 80 and 91, Ladbrooke-road, Kensington, to abut upon Ladbrooke-road and Boyne-terrace-mews (Mr. W. Flockhart for Mr. E. Davis).—Consent.

Formation of Streets.

Greenwich.—That an order be issued to Messrs. Bendel, Wood, & Co., sanctioning the formation or laying out of new streets for carriage traffic on the Eastcombe estate, Charlton-road, Greenwich, and in connexion therewith the widening of a portion of Charlton-road (for the Norwich Union Life Assurance Company). That the names Eastcombe-avenue, Wyndcliff-road, Sandtoft-road, Eversley-road, Bramshot-avenue, Sberington-road, Hopedale-road, and Mayhill-road be approved for the new streets.—Agreed.

Lewisham.—That an order be issued to Messrs. J. Edmondson & Son sanctioning the formation or laying out of six new streets for carriage traffic on the Old House estate, Sydenham-road, Sydenham, and in connexion therewith the widening of a portion of Mayow-road. That the names Bishopsthorpe-road, Queensthorpe-road, Earlsthorpe-road, Kingsthorpe-road, Princethorpe-road, and Dukethorpe-road be approved for the new streets.—Agreed.

Hoolwich.—That the request of Mr. G. F. Logsdail for Mr. G. F. Jones, for an extension of the period within which the roadways of four new streets for carriage traffic, to be named respectively Cadwallon-road, Gerda-road, Thaxted-street, and Rushbrook-street, out of the south side of Southwood-road, New Eltham, were required to be clearly defined throughout by posts and rails, or so otherwise as the Council might permit, be granted.—Agreed.

Cubic Extent.

Lambeth, North.—A building to exceed in extent 250,000, but not 450,000 cubic feet, and to be used only for the purposes of a railway station, mortuary, chapel, and residence for officials, on the west side of Westminster-bridge-road, Lambeth, and abutting also on Newnham-terrace (Messrs. Perry & Co. for the London and South-Western Railway Company).—Consent.

Space at Rear.

Norwood.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story addition at the rear of No. 78, Upper Tulse-hill, Norwood, with an irregular open space at the rear (Messrs. Crabb & Son for Mr. A. B. Passmore).—Consent.

Width of Way and Height of Building.

Holborn.—A chapel, shops and offices on a site on the east side of Southampton-row, Holborn, at less than the prescribed distance from the centre of Eagle-street, and to exceed in height the width of that street (Mr. A. Keen for the Baptist Union Corporation, Limited).—Consent.

The recommendation marked † is contrary to the view of the Local Authorities.

BOOKS RECEIVED.

BRICKLAYING. By Owen B. Maginon. PROCEEDINGS OF THE SECOND ANNUAL CONVENTION OF THE ARCHITECTURAL LEAGUE OF AMERICA. (R. R. Donnelley & Sons, Chicago.) LIST OF R. H. S. CURVES, in complete set of twenty-three templates. By Professor R. H. Smith. (Casell & Co.) LLANDAFF CHURCH PLATE. By G. Eley Halliday, F.R.I.B.A. (Bemrose & Sons.)

Correspondence.

To the Editor of THE BUILDER.

HINTS ON STABLES.

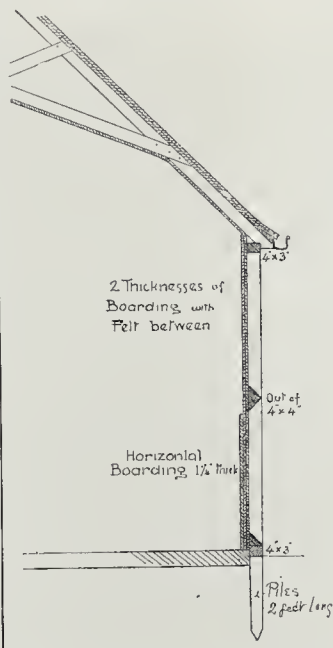
SIR,—While I agree with much that your contributor has written,* there are several points on which I differ from him.

Certainly ventilation is a most important and difficult point. I think fall-back windows—either iron or wood—with side hoppers, make the best inlets. Although I have used a large number of roof extractors, by at least four different manufacturers, I have found none completely satisfactory. Probably extracts near the floor of the stable, with flues carried to an upcast at one end or the centre of a range, with the draught helped by heat or a fan, would be the best.

I have not found that horses do best in stone-walled stables, and they are certainly dangerous if horses are put in before they are thoroughly dry; and they require an inside lining. Cement, I think, looks well if painted with enamel paint. Wood linings usually have a space behind at least the thickness of the grounds, in which mice and other vermin collect.

In brick stables blue Staffordshire bricks make a good dado, and are the best for division walls, as it is possible to get a fair face on both sides of a 9-in. wall. I like Aston Hall buff bricks above, as they are clean and free from gloss. Glazed bricks make a good dado for passages and washing-boxes, but are apt to get chipped in a loose-box.

To my mind, the best boxes for hunters are those built of wood, with tiled roofs. Horses nearly always do well in these, and they can be designed to look well. If fixed on piles they are tenants' fixtures—a great advantage to many hunting men. I have built a large number with the framing outside, the horizontal pieces being cut on the diagonal to throw off the rain (see sketch), with two thick-



nesses of 3/4-in. boarding, with inodorous felt between, nailed on the inside, and 1 1/4-in. kicking-boards, with rounded top as a dado, 3 ft. 6 in. high. The 3/4-in. boards are nailed vertically to break joint and the kicking-boards horizontally. The graining can be blacked and the panels coloured. I have also built them with match-boarding inside and weather-boarding on the outside, but do not

consider them so strong, and the space between the boarding collects vermin.

There is usually no difficulty in keeping the drains outside the stables, but when it is necessary to have gullies inside, the outside end of the drain can be disconnected and have an air-pipe and an upcast shaft fixed at the head of the drain.

A loft over the stables is not good for hay and tends to block light and air from the yard, but it is convenient and often economical. A fodder store at the end of the passage, where there is one, is quite as convenient, but takes up space.

I like passages 7 ft. 6 in. wide, but I do not feel so sure about wide doors being an advantage. I think that a cart comes oftener to grief at a wide gateway than at a narrow one, and the same may apply to a stable door. Wide doors take a great deal of room in opening, unless they slide.* I have put 7 ft. 6 in. sliding doors to a racing stable, where I believe they answer well. For ordinary loose-box doors 4 ft. is a good width, but I prefer 4 ft. 6 in. or 5 ft. for brood-mares.

All angles should be well rounded about any stable. I do not like grooved bricks for floors. They are very bad to keep clean. Plain clinkers, or Buckley grey brick on edge make the best, but small paving stones laid in and hushed with cement make an excellent floor, and are largely used in Ireland, where good paving bricks are expensive. For fall I generally give 3 in. in the length of a box, which is enough for drainage. A horse looks best when standing slightly uphill, but I doubt if it is a natural position. A horse will choose that position at the covert side with a man on his back, but he usually places his forelegs uphill when loose in a field with no weight on his back. I have even given less fall in both hunting and racing stables.

Twelve feet six inches by 10 ft. 6 in. is a good loose-box for a hunter. For racehorses I have found 13 ft. by 11 ft. 6 in. a good size. I strongly object to wide stalls. A horse gets across them, and is more likely to get cast than in a 6-ft. stall. Large horses and cart-horses should have 6 ft. 6 in.

I prefer glazed earthenware mangers and water-pots to any other. Slate mangers are also good. I have fitted a large number of boxes with water troughs supplied automatically by ball-tap cisterns at the end of each range. If desired, galvanised-iron lids can be fitted to fold down over the water to prevent the horse drinking, but personally I think it is very seldom that a horse will drink too much if a supply is always available, while there is a danger of his doing so if he only gets it occasionally.

Corrugated iron is not a good material for stables. It is hot and noisy, and reflects a great deal of heat into the yard, and does not last so long as wood and tiles. RICHARD T. BECKETT.

WHITCHURCH ASYLUM COMPETITION.

SIR,—In regard to your remark that our plan covers more ground than the winning one, the winning design measures approximately 1,950 ft. by 750 ft. over the main buildings, ours measures 1,250 ft. by 550 ft., and is consequently a little more, not less, compact. Our two longest main corridors measure 650 ft., the two longest on the winning design 600 ft. and 700 ft. respectively.

As the planning of different sections of the ward blocks is different for the several sections of patients, we considered we were right in arranging them so that both in the smaller and larger schemes patients occupied wards planned for them instead of getting the smaller scheme, as in the winning design, by cutting out one entire class of patients and distributing those of the patients (in the smaller scheme) in buildings to be ultimately adapted for another class of patient. WILLS & ANDERSON.

CHIMNEY PIECE, AUDENARDE.

SIR,—At my second visit to Audenarde in 1887 I made a sketch and took several plans and measurements of the interesting chimney in the Salle du Conseil, which appears in the Builder of February 23. In my drawing the date, 1529, occurs in the centre of the lintel, from which I gather that the Coat of Austria, surrounded by the *Tison d'Or*, as shown by Mr. Cotman, is a modern innovation. It certainly was not there in 1887, and the shield, be it noticed, is earlier in shape than those of the other four coats. I merely send these few words to show the addition, and not to criticise the drawing; indeed, with the heraldries re-coloured, it would be difficult to detect and detach the old from the new, and I only found it out by comparing Mr. Cotman's good sketch with my poor one.

I fancy the coat on the sinister end of the lintel is that of Luxemburg (not Burgundy). The spacing out indicates clearly that the arrangement as at present is unusual, and, as a composition, rather too crowded. E. SWINFEN HARRIS.

"AN ANCIENT LATCH."

SIR,—Referring to the interesting note and sketch of a Norfolk latch in your issue of last week, I may

* Should they not always be made to slide?—Ed.

* See Builder of February 16

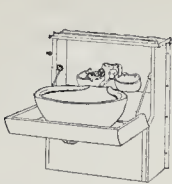


Fig. 1.



Fig. 2.

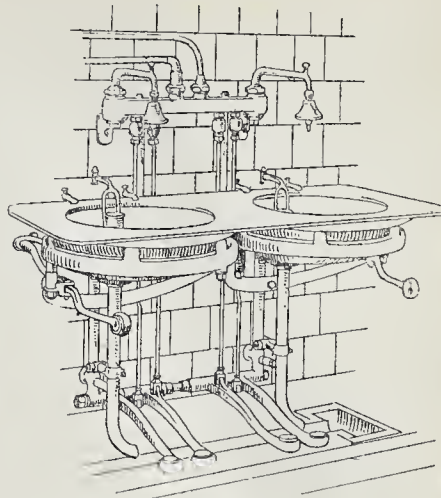


Fig. 3.

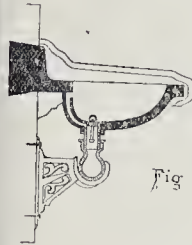


Fig. 7.

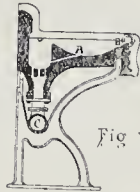


Fig. 9.

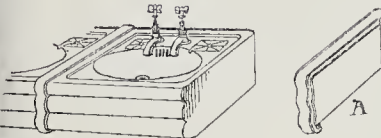


Fig. 4.



Fig. 5.

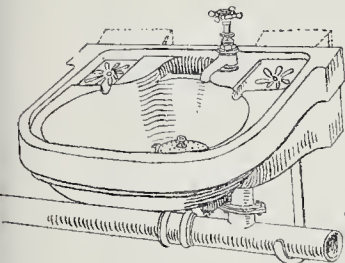


Fig. 6.

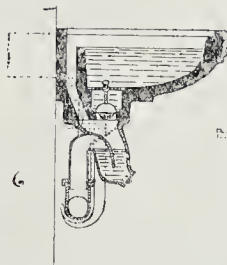
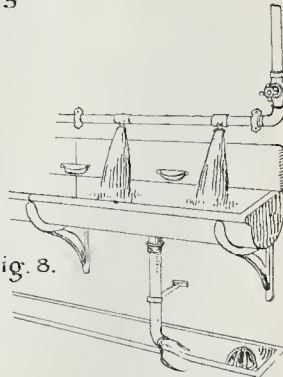


Fig. 8.



Illustrations to Student's Column.

allowed to remark that I came across a similar form of hitch in a farm house near Cardiff, when making a survey of dilapidations, just before Christmas last. This house was at least 100 years old.

H. L. HILEY.

The Student's Column.

ANITARY FITTINGS AND PLUMBING.
9.—LAVATORIES (continued).

THE prejudice against exposed lavatories and waste-pipes is now nearly dead, and the practice of supporting them on metal brackets or legs is rapidly increasing. We need not enter into the details of these supports, but may point out that elaborate scrollwork and ornamentation are quite out of place. The simpler the support is the better. Cheap fittings, the brackets and frieze are generally of painted iron; sometimes the iron is enameled, but this is more expensive. The neatest arrangement we have seen consists of round nickel-plated brass brackets or legs (with similar rails fixed horizontally a few inches below the slab to form towel-rails). Some use porcelain-enameled fireclay legs are used; for the most expensive work marble

brackets or legs are sometimes used in conjunction with marble friezes, tops, and skirtings.

Many persons, however, still prefer "cabinet lavatories," especially for dressing-rooms, but as the actual fittings do not differ materially from those already described, no illustrations need be given. A word of warning, however, should be uttered against certain combinations occasionally adopted. In one catalogue a tip-up lavatory is fixed over a *stop-sink*, the whole being inclosed in an elaborate piece of cabinet-work. The writer of a book on plumbing, published about half-a-dozen years ago, describes as "a very handy combination" a cabinet lavatory having a small urinal basin attached inside the door of the cupboard under the lavatory; the urinal is fixed close to the hanging stile of the door, and is connected to the waste-pipe with a swivel joint; the waste from the lavatory passes into the urinal basin, when the cupboard door is shut, but what happens when the urinal is brought forward by opening the door we are not told. Contrivances like these, however ingenious they may be, are simply abominations. Urine is one of the very foulest parts of domestic sewage, and ought to be kept as far away from lavatories as possible. Among the adjuncts of domestic lavatories

may be mentioned receptacles (generally of nickel-plated brass or other metallic compound) for sponge, soap, tumbler, &c., and it is a good plan to provide a receptacle for rings. This often takes the form of a small cup at the top of the brass fitting to which the upper end of the plug-chain is attached. The other receptacles are generally fixed to project from the marble or other skirting at the back of the basin.

Folding lavatories are often adopted in offices where exposed basins would be somewhat unsightly, and also in confined spaces such as the lavatory compartments of railway carriages and the state-rooms of ships. An example is given in fig. 1. They consist of a white earthenware or enamelled-iron basin fixed to the inside of a fall-down door. The basin has a projecting rim to prevent splashing, except at the back; on closing the door the contents are discharged over the back of the basin into a receiver below, which is fitted with a connexion for the waste-pipe. The taps and soap-dishes fit into the basin when the door is closed.

Small hand lavatories (fig. 2) are more frequently seen on the continent than in this country; the foul nature of our atmosphere compels us to adopt basins where a more

thorough ablation can be obtained than in these small fittings.

Surgical lavatories are now almost invariably made with treadle action, so that the hot and cold supplies and the waste can be operated by the foot or knee; this is a great convenience to the surgeon, and does away with the risk of contaminating the taps with foul or possibly infectious matter from the operator's hands. Fig. 3 shows a pair of the surgical lavatories, fitted by Shanks & Co., in the operating theatres of the Western Infirmary, Glasgow. The basins are of white vitreous porcelain, 1 ft. 6 in. in diameter, and fixed 2 ft. 2 in. from centre to centre on short vertical studs rising from circular cast-iron rims, the rims being carried by central back supports fixed clear of the wall. Every part of the framework can therefore be easily cleaned. The slabs are of glass $\frac{3}{4}$ in. thick, and are fitted with a patent catch arrangement so as to be removable and adjustable. The hot and cold supplies are actuated by treadles fitted with rubber pads. The gun-metal box fixed to the wall above the basins has inlets for hot and cold water, and a swivel arm at each end for douche and spray. The standing waste-and-overflow is actuated by a knee treadle fitted with rubber pad, and can be easily removed for cleaning. The waste-pipe is copper, held in position by a patent clutch, so that it can be removed for cleaning, and discharges into an open channel in the floor.

A modification of the supply arrangements consists in having a single treadle for both cold and hot supplies. A slight depression of the treadle opens the cold-water supply, and a further depression opens the hot-water supply, the hot and cold water being mixed in the gun-metal box before reaching the basin. This prevents the risk of scalding the hands or breaking fragile instruments.

"Constant-stream" lavatories are also made for surgical purposes. In these a constant stream of water is admitted in a series of jets from perforations in the front of the basin, the water being continuously discharged over a weir at the back (see fig. 9). After the valves are closed, the water in the basin drains away to the waste-pipes through a small hole in the bottom. The valves are actuated by treadles, and the hot and cold water passes through a mixing box before reaching the basin. With lavatories of this kind a waste treadle is not required.

Enamelled fireclay lavatories are largely adopted in schools and other places where they are likely to be subjected to rough usage. The ordinary basin (fig. 4) contains no special features. The overflow is formed in the fireclay, and the ends of adjacent slabs are either formed with plain built-joints or with an enamelled fireclay joint-piece which overlaps as shown at A. Sections of two of these basins are given in fig. 5. These lavatories may be supported on glazed brick piers, enamelled fireclay pedestals, or iron brackets or standards. The sizes of the tops range from about 20 in. by 18 in. to 26 in. by 20 in. To facilitate the cleaning of the floors and walls, "corbel" lavatories are now made, having fireclay lugs for building into the walls. The example in fig. 6 is known as Shanks's "Projector"; it has a rounded front, a safety waste, and an improved overflow, and the glaze is continued under the basin. The sizes range from 18 $\frac{1}{2}$ in. by 15 $\frac{1}{2}$ in. to 25 in. by 19 $\frac{1}{2}$ in. Adams's "Helios" lavatory range (fig. 7) has fireclay brackets in addition.

"Constant-stream" lavatories are now largely used for schools and other public institutions. The great advantage they possess over the ordinary basins is that the water is constantly changing, and two or more children cannot therefore wash in the same water; this reduces the risk of spreading contagious or infectious diseases. A further advantage is that a great number of persons can wash in a short time, as no time is lost in waiting for the emptying of basins. A single tap can be fitted to a range, and this tap can be so arranged as to be under the sole control of the attendant. One of the simplest lavatories of this kind is the trough lavatory with sprays (fig. 8). The illustration shows Doulton's arrangement, the troughs being 40 in. long and 12 in. wide, supported on iron brackets. The waste-pipes are of glass-enamelled iron and discharge into a floor channel. The sprays are 20 in. apart.

Fig. 9 is a section of Shanks's "Instantan" lavatory, in which the water is admitted to the shallow basin through a series of perforations

B in the front, and overflows over a weir at the back; a small hole A is provided for emptying the basin when the water is turned off. No plug or other waste fitting is required. The iron standards are arranged to carry a horizontal waste-pipe C, into which the water from each basin flows directly. For schools the slabs measure 18 $\frac{1}{2}$ in. by 17 $\frac{1}{2}$ in., and for asylums 27 $\frac{1}{2}$ in. by 18 $\frac{1}{2}$ in.

GENERAL BUILDING NEWS.

RE-OPENING OF ST. JOHN'S CHURCH, CHAPELTOWN, YORKSHIRE.—The Parish Church of St. John, Chapel-town, was re-opened on the 23rd ult. after undergoing enlargement. A new aisle has been added, a vestry and organ-chamber built, and the chancel extended. Mr. J. W. Sykes, of Hoyland, was the architect.

SWIMMING BATH, & C., BROAD-STREET, BLOOMSBURY.—Messrs. Clarkson have prepared plans and designs for the new swimming baths, &c., about to be erected upon a site in this street for the Metropolitan Borough of Holborn. The Guardians of the Poor for the Parishes of St. George, Bloomsbury, and St. Giles-in-the-Fields have adopted Mr. J. Grafton Izard's plans and designs for the Nurses' Home and Receiving House for Children which they are about to build in that same thoroughfare. In both cases the bills of quantities were prepared by Messrs. Gardiner & Theobald.

PROPOSED RECONSTRUCTION OF EMPIRE THEATRE, NEWCASTLE-ON-TYNE.—It is proposed to reconstruct this building according to plans by Mr. Frank Matcham, of London.

FISH MARKET, CARLISLE.—The new fish market at Carlisle was opened on the 10th ult. The building was designed by Mr. W. Harpur, the Borough Engineer.

PROPOSED HOSPITAL, KIRKBURTON, YORKSHIRE.—At a recent meeting of the Kirkburton Joint Isolation Hospital Committee, the Sites Sub-committee reported that Mr. Joe Berry, architect, Huddersfield, had been engaged to prepare plans, quantities, &c., for a hospital at Kirkburton. Mr. Berry's plans provide for an administration block of two stories, facing south. On the ground floor will be matron's, nurses', and doctor's rooms; kitchen, scullery, pantry, storeroom, and lavatory; a suite of discharging-rooms on the western side, consisting of undressing-room, bathroom, and dressing-room. On the first floor will be six bedrooms, a dressing-room, and bathroom. The out-buildings in connexion with the kitchen will be arranged on the northern side, and the tradesmen's entrance on the eastern side. It is proposed to build the ward pavilion practically on pillars, so as to allow a free circulation of air round and underneath the whole building, and it will provide accommodation for fourteen patients—eight in one ward and six in another. The entrance is to be in the centre of the building, and on the left of it is to be a cloak-store and pantry, and on the right a bath-room. Immediately opposite will be the ward kitchen, having two fixed windows allowing complete observation of the two wards. The isolation ward will contain accommodation in two wards for four patients, and there will be a ward kitchen in the centre. An open verandah will be built along the whole length of the building. Provision is made in the laundry block for wash-house, laundry, and drying closet, and there will be disinfecting rooms, ambulance stable, mortuary and view room, coal, coke, and wood stores. The entrance lodge, one story high, will contain living room, scullery, and one bedroom, and will be provided with out-buildings behind.

CONSTITUTIONAL CLUB, WEST HARTLEPOOL.—It is proposed to erect a new Constitutional Club at West Hartlepool from plans prepared by Mr. J. J. Wilson. The cost of carrying out these plans is estimated at 8,000l. The ground floor will contain several suites of offices. On the first floor is shown a billiard-room and clubrooms; and on the second floor a large hall and additional offices.

THEATRE, SOUTHSEA.—Plans of the new theatre to be erected in Elm-grove, Southsea, at the corner of Thicket-place, have been passed by the Roads and Works Committee. The theatre, upon which it is estimated 40,000l. will be spent, has been designed by Mr. W. G. R. Sprague. The site is situated about the building, which will have a frontage of 100 ft. to Elm-grove, and a depth of 100 ft., will be set well back from the roadway, and a covered porch in front will afford shelter to people waiting at the doors for admission. The house will comprise a pit and stalls on the basement level, a dress circle on the first tier, with raised balcony forming the second tier, above which will be placed the gallery. The specifications provide that the materials to be used in the building are stone, brick, and concrete, and the construction of the auditorium, galleries, and roofs will be carried out in concrete and steel girders and joists. The elevation to Elm-grove will be carried out in stone or brick, with stone or cement dressings. The decoration of the auditorium and entrances are proposed to be executed in fibrous plaster and carton pierre in gold and colour. Saloons or lounges and retiring-rooms are planned for the different sections of the audiences.

The seating accommodation is estimated approximately at 1,644, divided up as follows:—Stalls, 144; pit, 650; dress circle, 160; balcony, 102; gallery, 450; 16 private boxes (to hold three each), 48.

SALTMED HALL, CARLISLE.—On the 13th ult. the memorial stones of the new Saltmed Hall of the Cardiff Forward Movement were laid. The new hall is situated at the corner of Hereford-street and Maitland-place, Grangetown, and has been erected from the designs of Messrs. J. P. Jones, Richards, and Budgen, architects. The building is capable of holding 737 people, not including the choir. The body of the hall is surrounded on three sides by galleries, while at the rear of the platform is a gallery for the choir, capable of seating forty-six people. The galleries are supported by cantilevers, and are approached by two stone staircases with direct access from the street, while the body of the hall has three doorways. Provision is made for ministers' and other retiring rooms, with lavatory accommodation. Owing to the unstable nature of the ground concrete pillars had to be built up from the main 18 ft. below the ground level, the superstructure being wholly carried on arches and girders. The elevation is carried out in red brick with Bath stone mullions, &c., and the roof is of American green slates. The interior woodwork is stained and varnished dark and light oak, and the ironwork painted a soft green. The contract for carrying-out the work was 1,038l., exclusive of seating, the contractors being Messrs. Handford & Elsworth, Cardiff.

NEW THEATRE, COLCHESTER.—At a meeting of the Council at Colchester on February 20, plans for the new Theatre Royal, which is to be erected on the site of the present theatre in St. Botolph's-street, for Mr. Chas. Macdonald, were submitted and approved. The plans have been prepared by Mr. John P. Briggs, of London. The theatre will be fireproof throughout, and the entire house will be fitted with electric light. The whole of the auditorium, entrances, saloons, dressing-rooms, &c., will be heated by hot-water pipes and radiators, and the ventilation will be carried out on scientific lines. It is hoped to have the alterations completed by the autumn.

FOREIGN.

FRANCE.—Varnishing day for the New Salon will be on April 21, that of the Old Salon on April 30. The pavilion which was erected for the works of Rodin in the square De l'Alma, adjoining the great exhibition, is to be re-erected at Passy.—M. Saint-Marceaux has just completed the monument to President Faure, which is to be placed in Père la Chaise cemetery. The monument consists of a sarcophagus, on which is a recumbent figure in bronze of the late President, round which are draped the Russian and French flags.—MM. Allain and Heubes, architects, have been commissioned to rebuild the School of Physics and Industrial Chemistry. The cost is estimated at nearly 2,000,000 fr.—M. Fleury has been elected President of the Society of Architects of the Seine-et-Oise for 1901. M. Tendon has been elected President of the Society of Architects of Anjou.

A building is to be erected for the Municipality of Auray (Morbihan) which is to contain a hospital for invalids, and an atelier for the aged. The Municipality of Paris will next month take official possession of the smaller art palace on the Champs Elysees.—In the new Maire at Suresnes three allegorical ceiling paintings are to be placed in position shortly, executed by M. Michel Lançon; also two landscapes by M. Jules Ferry, representing views taken in that part of the suburban district.—A certain number of the inhabitants of Toulouse have entered a protest against the intention of the Municipality of that town to place in a public garden the relief by M. Injalbert, "Fausnesses et Satyres," left to the town by a private owner, under the pretext that this work is of a "nudité inconvenante."—The Municipal Council of Blois has entered an energetic protest against the intention of the city of Paris to take a part of the waters of the Loire to complete the Paris drinking water supply.—M. Jaquet has been elected President for 1901 of the whittaker's Union of Lyons.—The Municipal Council of Marseilles has voted a sum of 25 million francs for the improvement of the old quarters of the city in the rear of the Bourse.

MESSRS. KIRK & RANDALL, THE METROPOLITAN ASYLUMS BOARD.—We understand that the claim of Messrs. Kirk & Randall against the Metropolitan Asylums Board for damages under their contract for the erection of a fever hospital at Tooting, involving a sum of 41,475l., has been terminated by the withdrawal of the plaintiffs' claim on condition that costs were not claimed by the Board.

BARRY RAILWAY VIADUCT, TAFF VALLEY.—The permanent way has been laid over the railway viaduct across the Taff Valley at Taff's Well. The viaduct connects the Barry system with the Rhydney system, and crosses two roads, two railways, the river Taff, and the Glamorganshire canal. The structure consists of seven spans, the highest point from ground to parapet being 112 ft. The total length is 1,420 ft. The viaduct was designed by Sir John Wolfe Barry, the contractors having been Messrs. Price & Wills, of Westminster.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.

—Mr. Samuel Knight, architect, of 175 and 176, The Temple Chambers, Tudor-street, E.C., has taken into partnership Mr. C. E. Lancaster Parkinson. Mr. Parkinson, for a considerable recent period, has been engaged as an official in the Architects Department of the London County Council. The style of the firm will be "Samuel Knight and Parkinson."—Messrs. Greaves, Bull, and Lakin, of Warwick, dealers in limes and cements, have converted their business into a limited company under the title "Greaves, Bull, & Lakin, Limited," and have removed their head office from Warwick to their works at Harbury, the postal address being "Harbury, Leamington."

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.

—The annual dinner of the members of the Nottingham Master Builders' Association was held on the 22nd ult., Mr. H. Vickers presiding. The loyal toast having been honoured, Mr. Price proposed "The Mayor and Corporation of Nottingham," and coupled the toast with the names of the Sheriff and Councillor J. Wright.—The Sheriff, in reply, observed that the Corporation as a whole had during the past twenty or thirty years been setting themselves the task of improving the town in many respects, and it could not be denied that their efforts had to a great extent been successful. Councillor Wright also responded. In submitting "Success to the Nottingham Builders' Association," Mr. J. W. Woodcock remarked that the Association had had a fair amount of success, but they would all like it to have more. Such associations were very necessary, because without them builders would be to a great extent at the mercy of the trades-unions. In self-defence, therefore, they were practically obliged to come together. But they did not want to band themselves together with the sole idea of defensive tactics; it was proper to be associated if only for the opportunity of having such enjoyable evenings as that.—The toast was acknowledged by Mr. F. H. Fish, who said the builders were never in a better form for dealing with the men, and the relations between employers and employed were never better. Up to the end of last year they were very much troubled with the plastering section of the trade, but through the instrumentality of that association, which formed a committee to deal with the matter, they were enabled to get a very good settlement with the men.—Mr. James Wright submitted the toast of the "National Federation and Kindred Associations," and in doing so said their Association was connected with one of the most ancient and important trades in existence—a trade which paid over sixty millions of pounds in wages per year. He urged the Association to continue connexion with the National Federation. The Midland Branch of the National Federation was an attempt to unite and weld into one body all the master builders' associations of the Midland counties. There were many interests to guard against and many rights to defend of necessity in such a great and important industry as the building trade, not only in regard to their relationship with workmen, but also with regard to their relationship with architects, great public bodies, and the public at large for whom they worked. The National Federation had now in hand, and had had in hand for many years, with the Institute of British Architects, the drawing up and forming of a national and recognised form of contract which, when it was complete, would be satisfactory to all parties. During the past year this had been under discussion by the Midland Federation, and a form of estimate had also been under consideration. The Midland Federation had had a prosperous year, and new builders' associations had been started in many towns where such organisations had not previously existed. The speaker urged those present to support the associations financially; it was due from them as employers that they should make some sacrifice to protect their own interests and for the general welfare of the trade. In reply, Mr. A. Chambers said they seemed to lose sight to a very great extent of one of the greatest objects of their federation, and this was organisation. It had been said that they were not only formed for defence, but the latter was unimportant as a very good object, and it they were desirous of peace they must be prepared for war. He hoped the time was not far distant when they would have the benefit of a national form of contract—one in which they could place reliance.—Mr. J. B. Alliot also responded, and remarked that the necessity for being united was very much greater among the employers than among the workmen. Mr. J. H. Vickers proposed "The Visitors," Mr. John Sully, suitably replying. The health of "The Chairman" was submitted by Mr. W. Edgar and duly responded to.

LONDON COUNTY COUNCIL ELECTION.—The list of nominations made in this election includes the following candidates:—Mr. L. Sharp (Brixton), Mr. J. E. Sears (North Hackney), Mr. R. Williams (North Lambeth), Mr. C. Fitzroy Doll (South St. Pancras), Mr. T. W. Emden (Strand), and Mr. W. Hunt (Wandsworth), architects; Mr. J. Ellis (Greenwich), Mr. W. Goodman (West Islington), and Mr. C. Angel (North Lambeth), builders; Mr. E. G. Paddon (South Paddington), sanitary engineer; Mr. J. A. Baker (East Finsbury), Mr. J.

Richmond (North Hackney), Mr. W. C. Parkinson (North Islington), engineers; Mr. H. R. Taylor (North Camberwell), bricklayer; Mr. J. Jeffrey (Chelsea), Mr. J. A. Thornhill (Dulwich), Mr. G. H. Booth (Mile End), and Mr. T. B. Westcott (West St. Pancras), surveyors; Mr. T. P. Gaskell (Clapham) and Mr. H. Ward (Hoxton), civil engineers; Mr. S. Collins (Leamington), stone merchant; Mr. J. Williams (North Lambeth), timber merchant.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.

—At the usual meeting of the society, held on the 23rd ult., Mr. John G. Dunn read a paper on the "Practice of Chimney Stalk and Boiler Building." To ensure the stability of a stalk, he said, the foundations must be built with best Portland cement, with footings projecting the thickness of the wall, or inverted arches used. The stalk should have a square base, a batter of 1-in. to the foot, with hoop iron horizontal ties. The brick courses should be at right angles to the batter, and no port holes cut after the stalk had taken its bearing. Further remarks were made on the subject of efficiency of draught and architectural treatment, and then the lecturer passed on to the consideration of boiler setting, explaining carefully the various types of flues, boilers, and fuel economisers, the entire paper being of a most practical nature.

NATIONAL FEDERATION OF BUILDING EMPLOYERS.

—We learn that Mr. A. Krauss, builder and contractor of Bristol, has been unanimously elected President of the National Federation of Building Employers of the United Kingdom.

FIRE AT PARISH CHURCH, STURTON, NOTTINGHAMSHIRE.

—The Parish Church of St. Peter's, Sturton, was practically destroyed by fire on the morning of the 24th ult. The edifice was gutted, only the outside walls and the tower remaining.

BUILDING TRADES EXHIBITION.

—At the forthcoming Building Trades Exhibition one feature will be a special exhibition to be called "The Surveyor's" exhibition, illustrating everything in connexion with house drainage, sewerage, sewage disposal, and road-making materials and appliances. The exhibition will include drawings representing old defective and modern improved systems of drainage; models of sections of drainage badly laid and well laid for comparison, photographs of bad drainage work taken on the spot; also "photographs of eminent sanitarians who have insisted on the essentials of sound drainage." There will also be a varied exhibition of sanitary fittings and drainage and road materials.

DRAINAGE OF CHELSEA WORKHOUSE.

—The Guardians of the Poor have instructed Mr. Chas. E. Gritton, A.M. Inst. C.E., of London and Selhurst, to prepare a scheme for the drainage of Chelsea Workhouse for the approval of the Local Government Board.

CAPITAL AND LABOUR.

THE NORTHERN BRICKLAYERS' DISPUTE.—We read that the bricklayers and labourers in Newcastle and Gateshead returned to work on the 25th ult., after a cessation of labour for about eight months.

ABERDEEN PLASTERERS' STRIKE.

—The majority of the operative plasterers in Aberdeen struck work on the 25th ult against a reduction of wages from 84d. to 7s. an hour. Messrs. James Bannochie & Sons, the principal firm in the trade, and another employer have agreed to continue the present rate of wages, and as work is plentiful meantime it is not anticipated that the strike will be long continued. A meeting of the men affected by the dispute was held on the 25th ult., when arrangements were made for carrying on the strike. During the time they are idle the operatives will be in receipt of 27s. a week each, the whole of them being connected with two trades-unions. The masters regard the present rate of pay as excessive, and express determination to resist the demands of the men.—*Glasgow Herald.*

LEGAL.

IMPORTANT POINT AFFECTING ARCHITECTS.

THE cases of J. T. Chambers v. Harrop Goldthorpe, and Restell and others v. Nye came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Collins and Romer, on the 26th and 27th ults. As the same point practically was raised by both appeals, they were heard together.

The case of Chambers v. Goldthorpe came before the Court on the appeal of the defendant from the judgment of a Divisional Court composed of Justices Channell and Bucknill. This was an action brought by Mr. J. T. Chambers, an architect, for fees. The defendant employed the plaintiff to prepare plans for buildings he was then about to erect, and to superintend and measure up the work. The work was done by a contractor. The contract between the defendant and the contractor provided by Clause 20 that "a certificate of the architect or an award of the referee hereinafter referred to, as the case may be, showing the final balance due or payable to the contractor, is to be conclusive evidence of the works having been duly completed, and that the

contractor is entitled to receive payment of the final balance." Clause 22 provided that in case of any question, dispute, or difference arising between any proprietor, or the architect on his behalf, and the contractor as to the various matters therein specified arising under or out of the contract, including questions "as to the works having been duly completed," or in case the contractor should be dissatisfied with any certificate of the architect under certain clauses of the contract, "or in case he (the architect) shall withhold or not give any certificate to which the contractor may be entitled, then such question, dispute, or difference, or such certificate, or the value of the matter which should be certified, as the case may be, is to be from time to time referred to arbitration." It seemed that the plaintiff had incorrectly measured up certain of the materials used, the result being that the amount of the certificate was larger than it ought to have been. The defendant admitted the plaintiff's claim, but counterclaimed for damages and negligence. The County Court Judge of Holmfirth gave judgment for the plaintiff on the claim and for the defendant on the counter-claim, and from this decision the plaintiff appealed to the Divisional Court, which held that the plaintiff under the contract was acting in a judicial position, and therefore that no action would lie for negligence apart from fraudulent or dishonest conduct. From this decision the defendant now appealed.

Mr. Lowenthal, for the appellant (defendant), contended that in the circumstances the plaintiff as architect was liable, because in measuring up the quantities he was acting as the servant of the defendant and not as an arbitrator. His contention also was that under the terms of the contract between the defendant and the builder the plaintiff was never employed in any sense as arbitrator between them.

Mr. Scott Fox, K.C., for the respondent (plaintiff), contended that his client acted as arbitrator under the contract, and that so long as he acted honestly he was not liable to an action for damages for want of skill.

Their lordships reserved judgment in this case until the next case was heard.

The case of Restell and others v. Nye came before the Court on the plaintiff's appeal from the judgment of Mr. Justice Mathew in the King's Bench Division.

This was an action against an architect, in which the plaintiff sought to recover money—alleged to have been received by the defendant to the plaintiff's use—also damages for the defendant's negligence. The defendant was employed by the plaintiff as architect in connexion with the building of a bungalow for the plaintiff in Sussex. The terms of the employment of the defendant were contained in certain letters which passed between the parties, from which it appeared that the defendant was to be paid by the plaintiff for "plans, specifications, and supervision of works," 5 per cent. upon the amount of the expenditure, travelling and out-of-pocket expenses to be charged extra. In accepting the defendant's offer the plaintiff wrote that the charge was to be an inclusive charge, covering everything. The defendant entered upon the work. He prepared a specification on which tenders were obtained, and included therein a provision that surveyor's charges for bill of quantities should be 2½ per cent. on the amount of the estimate, and for drawings, &c., 10s. 10s. The defendant prepared a bill of quantities and obtained a tender from some builders at Brighton for the erection of the bungalow for 1,700l. This tender was accepted, and a contract was signed by the plaintiff which provided that the price should be paid by instalments upon the defendant's certificates, and that his final certificate should be conclusive evidence that the builders were entitled to receive payment of the final balance. The work was completed, and the plaintiff paid the contract price, together with the cost of certain extras on the defendant's certificates. The defendant was paid by the builders 2½ per cent. on the contract price for taking out the quantities, and the ten guineas for the drawings. The plaintiff alleged that the receipt of these payments by the defendant was a breach of the defendant's term of employment, and was alternatively a secret profit made by the defendant in the course of his employment. The defendant contended that the ordinary course of business had been followed, and that the plaintiff was fully aware that the cost of taking out the quantities was not included in the defendant's charges for acting as architect to the work. The plaintiff's second head of claim was for damages for negligence on the part of the defendant. The plaintiff's case was that the defendant had omitted to check the builder's accounts with due skill and diligence, and had passed as extras works included in the contract, and had certified for sums improperly passed. The defendant denied these allegations. The plaintiff had died since the action was commenced, and the executors were substituted as plaintiffs. Mr. Justice Mathew held that the agreement between the plaintiff and the defendant did not cover the cost of taking out the quantities, but his Lordship felt compelled to add that he did not think the defendant had acted as an honourable man, because he had concealed from the plaintiff the fact that he was making this arrangement with regard to

the quantities. His Lordship said he was of opinion that the defendant had not held the scales impartially, and had been guilty of negligence which had benefited the builder at the expense of the plaintiff, but he was clearly of opinion that damages were not recoverable by the plaintiff in the circumstances. His Lordship therefore gave judgment for the defendant, but without costs. Hence the present appeal of the plaintiff.

Mr. Bray, K.C., and Mr. E. Morten appeared for the appellant (plaintiff), and Mr. Boxall and Sir Lennox Napier for the respondent (defendant).

The Master of the Rolls in giving judgment in both cases dealt first with the case of Chambers v. Goldthorpe. He said the only question raised by the appeal was one which arose on the counterclaim, and was whether Mr. Chambers was placed in the position of an arbitrator, or whether he was merely in the position of a person acting as agent of the building owner.

If he was an arbitrator, then the building owner could not sue him for negligence; he could only sue him for fraud or collusion, and there was no suggestion in this case of anything of the kind. When they looked at the building contract it was plain that under many of the clauses of the contract Mr. Chambers was only to act as agent for Goldthorpe. In those clauses his duty was simply to look after the interests of Goldthorpe, and in respect of those matters no doubt he would be liable to an action for negligence. But when they came to Clause 20 the question arose, did the architect still remain the agent of the building owner, or was he not an arbitrator? It seemed, said his Lordship, impossible to say that with regard to Clause 20 the architect's sole duty was to look after the interests of the building owner. The architect undertook the duty of bringing out a final certificate, and with respect to that he owed a duty to the builder as well as to the building owner, his duty being to hold the balance fairly between the one and the other. He therefore came to the conclusion that Mr. Chambers was in the position of an arbitrator, and that the counterclaim could not be maintained, and that the appeal must be dismissed. For the same reason he thought that the claim in the other case, "Restell v. Nye," could not be maintained, and that the appeal in that case should also be dismissed.

Lord Justice Collins concurred in thinking that the architect in each case was in the position of a quasi arbitrator, and that both appeals should be dismissed.

Lord Justice Romer dissented. He thought that if a person undertook for reward to value or estimate for another work to be done for his principal by a third person, he did not, so far as his principal was concerned, become in the position of an arbitrator, merely because he knew that his principal and the third person had by contract between them agreed that, in default of dispute previously arising with regard to the matter, his valuation or estimate was to be taken as conclusive and as determining the price to be paid by his principal for the work to be done by the third person. Acting as he would do, for his principal, if he was guilty of negligence causing damage he would be liable to his principal in an action brought by him. He therefore thought that the appeals in both cases ought to be allowed.

By a majority of the Court, therefore, both appeals were dismissed.

ACTION BY AN ARCHITECT.

On the 20th ult., at Darlington County Court, before Judge Temple, Mr. William Perkins, architect, Bishop Auckland, sued Messrs. Sykes & Co., ironmongers, Darlington, for repayment of 33*l.* paid by him in error of account. Mr. Luck, barrister, instructed by Messrs. Main & Co., solicitors, was for plaintiff, and Mr. Edward Wooler for defendants. The plaintiff's case, as stated, was that he was the architect for thirteen houses at Etherley-lane. Prior to that an arrangement existed with defendants by which he was to obtain some share of profits from business he introduced. He had paid defendants sundry cheques on account, but found they had debited him with 33*l.* for gas-fittings for these houses. He (plaintiff) did not order the fittings. Defendants should have looked to the contractor, Mr. T. Hilton, for the money. Defendants made a counter-claim for 8*l.* 7*s.*, and it was urged by Mr. Wooler that plaintiff could not claim the money even were it due, but the Co-operative Society, who had the houses built. It was further held that 20*l.* was paid by Hilton, the builder, and that the 33*l.* should come out of that. The case lasted a considerable time. The Judge decided in favour of the plaintiff, giving judgment for 33*l.* on the claim, and he also gave a verdict for plaintiff on the counter-claim.—*Newcastle Chronicle.*

WHAT IS A SCAFFOLDING?

At the Halifax County Court on the 21st ult., before Mr. Vincent Thompson, Assistant Judge, a claim under the Workmen's Compensation Act was heard. The claimant was Mrs. Harriet Hodgson, of Back Raglan-street, Halifax, and she sought to recover damages amounting to 200*l.* in respect of

an accident which befel her husband, Charles Hodgson, on September 11 last. The defendant was John Riley, plumber, Stanland-road, West Vale. Mr. W. H. Boocock appeared for the applicant, and Mr. F. C. Reed (Leayrod & Co., Huddersfield) for the defendant. The facts of the case, as stated by Mr. Boocock, were deposed to by witnesses, were that Hodgson, who only entered Riley's employ on the day of the accident as a journeyman plumber, was engaged in fixing new skylights in Briggs-royd Mill. Two ladders were used to get to the roof from the interior of the mill. The deceased fell from a platform between these ladders a distance of some 17 ft., fractured the base of his skull, sustained other injuries, and died the next day. The defence was that the platform on which the deceased was standing was not scaffolding within the meaning of the Act.—After hearing arguments on both sides, the Judge decided that the platform was not a "scaffolding," and gave a verdict for the defendant. He expressed sympathy with the widow. Mr. Reed said he did not ask for costs.—*Bradford Observer.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

21,356.—METAL LATHING: *M. Hillon.*—The laths are made out of strips of sheet-metal, and to enable them to "key" with the plaster as well as to stand out from the joists they are punched so as to present loops or tongues, which may be curved angular or rectangular in shape, and be set parallel to the sides of the strips or at an angle with them. The machine which bends and shears the rectangular tongues has two lifting-bars which sever the strip from the lower die and are joined to the upper die crosshead with rods and a crossbar. With the specification should be read No. 10,664 of 1899.

21,358.—METERS FOR GAS AND LIQUIDS: *H. Jensen.*—With the fixed walls of the meters are contained bellows of which the membrane has on one side, or both, a central solid plate surrounded with solid rings in order to leave narrow spaces or strips of the flexible material between them, the rings and the plate being joined to one another and to the walls of the meter by means of lever-links.

21,353.—SOUND-PROOF AND FIRE-PROOF FLOORS AND CEILINGS: *P. Hobbs.*—About the lower flanges of the metal joists are arranged hollow flanged skew-backs made of concrete, cement, terra-cotta, &c., upon the flanges of the latter are dropped rabbetted ceiling-slabs, whilst upon their upper edges are laid metal sheets which may be grooved, corrugated, or expanded in shape; then above the metal network, or sheets, and round about the upper flanges of the joists is laid a mass of concrete, a coating of plaster being applied underneath the slabs; for the ceiling-plaster the lower flanges of the skew-backs are grooved dovetail-wise, and by another method the concrete skew-backs may be cast about the joists when *in situ*.

21,350.—A CONTRIVANCE FOR WEIGHING MACHINES: *J. W. Cartwright.*—In the case of scales that indicate fractional parts of, say, a pound after the required weight to the nearest pound has been put into the weights' pan, a vertical arm is mounted upon the beam, and at its lower end is a weight which will oscillate within a dash-pot and is fitted with a strap to a drum on which is mounted a pointer travelling over a graduated scale above the beam; upon the vertical arm slides a weight for adjustment, which may be altered in respect of both its weight and place.

21,356.—A METHOD OF VENTILATION: *W. Birch.*—The appliance is for the withdrawal of polluted air by the operation of a gas-burner or furnace which is placed at the bottom of a shaft with which the ducts for foul air from the room are connected. In one form of the invention, and adapted for buildings, the foul air, as it flows through openings in the wall and ceiling of the room, is carried through flues to a shaft wherein a gas-burner is placed; in some instances the burner is arranged concentrically within a tube and eccentrically within the casing.

21,351.—A SAW GUIDE FOR MITERING MACHINES: *P. F. MacDonell.*—The saw guide is mounted so that one can set it at any angle about two axes, which are disposed at a right angle to one another, and is carried by a vertical standard which is joined with a ball-and-cup bearing to the table or base-board. The post or standard can, moreover, be set at any angle in the vertical plane as one turns it between two plates set at an angle of 90 deg. to the base-board.

21,301.—CLAMPS FOR JOINERS' USE: *G. Schmidt.*—The inventor's object is to enable one to clamp pieces of wood together at varying angles during the process of gluing; the jaws of the clamp are pivoted to two arms which are pivoted on to a boss between them, which has lugs that guide the arms and is screw-threaded that it may take a screw, at one end of which is a pivot-jaw and at the other end a handle; a right-and-left-handed screw serves to draw together the two arms for closing the jaw of the clamp. In another mode an eccentric, with a handle, is used for the adjustment of the arms, the eccentric being pivoted to links which are pivoted on to one of the arms and being caused to bear against the other arm, which a hook

that is in engagement with a slot retains in its position to support the thrust; the eccentric, when adjusted, is maintained in place by means of a pawl, which engages with ratchet teeth upon the eccentric.

21,400.—A SELF-CLOSING VALVE: *S. Kaplanik.*—A conical valve shuts the casing at its inlet side, and at a point midway a valve spindle closes it also, a groove cut in the valve spindle permits the current of liquid to the outlet when the valve has been forced inwards and the inlet end has at the same time been opened; either a spring or the pressure of the liquid will serve to force the valve against its seating.

21,411.—AN EXTINGUISHER: *F. S. Bright.*—The cylinder-shaped container of metal has a lid which makes an air-tight joint, being screwed on with packing, and to the middle of the lid is screwed the nozzle of the discharge-pipe, at the lower end of which, within the vessel, is screwed a strainer. At the side of the casing is a cage or holder for the acid-bottle, against the side of which is a thumb-screw which, when turned from without, will break the bottle.

21,413.—ELECTRICAL CUT-OUTS: *J. Sachs.*—For cut-outs with a fuse, which is placed inside a casing, a second fine wire is laid outside the casing, which will answer the purpose of an indicator through its own fusing when the main fuse blows, the pin terminals should be passed through an end piece of the tube-shaped casing, and the auxiliary fuse may be made of a strip of foil upon asbestos paper or some similar material.

21,427.—AN APPARATUS FOR PAINTERS' USE: *G. E. Holloway and Dellanga & Co.*—For purposes of paint-spraying the inventors cause compressed air to be forced through a tube, together with paint through the tail-ends of other tubes, into the spraying-nozzles upon a straightened or bent tube, which is to be rocked with the hand or with a lever; the tail-ends of the supply tubes are dipped either into the paint in the reservoir or into a vessel upon the shaft which dips into the paint, and will serve to stir up the paint.

21,439.—FLUSHING CLOSETS AND THEIR FITTINGS: *A. Male and J. Hodgson.*—For a float-valve in the inlet of the cistern, which is made air-tight, the inventors substitute an air valve, which is regulated with a float, and will prevent the entry of water just as it prevents the escape of air. In one modification of the apparatus the cistern is divided into two portions by an inner wall. The connection from one part to the other is regulated with a valve. The closing of the valve upon the opening of the discharge valve, together with the reversal of that action, provide a reserved flush. The principle involved may be adapted for a siphon discharge cistern, and for a single valve cistern also.

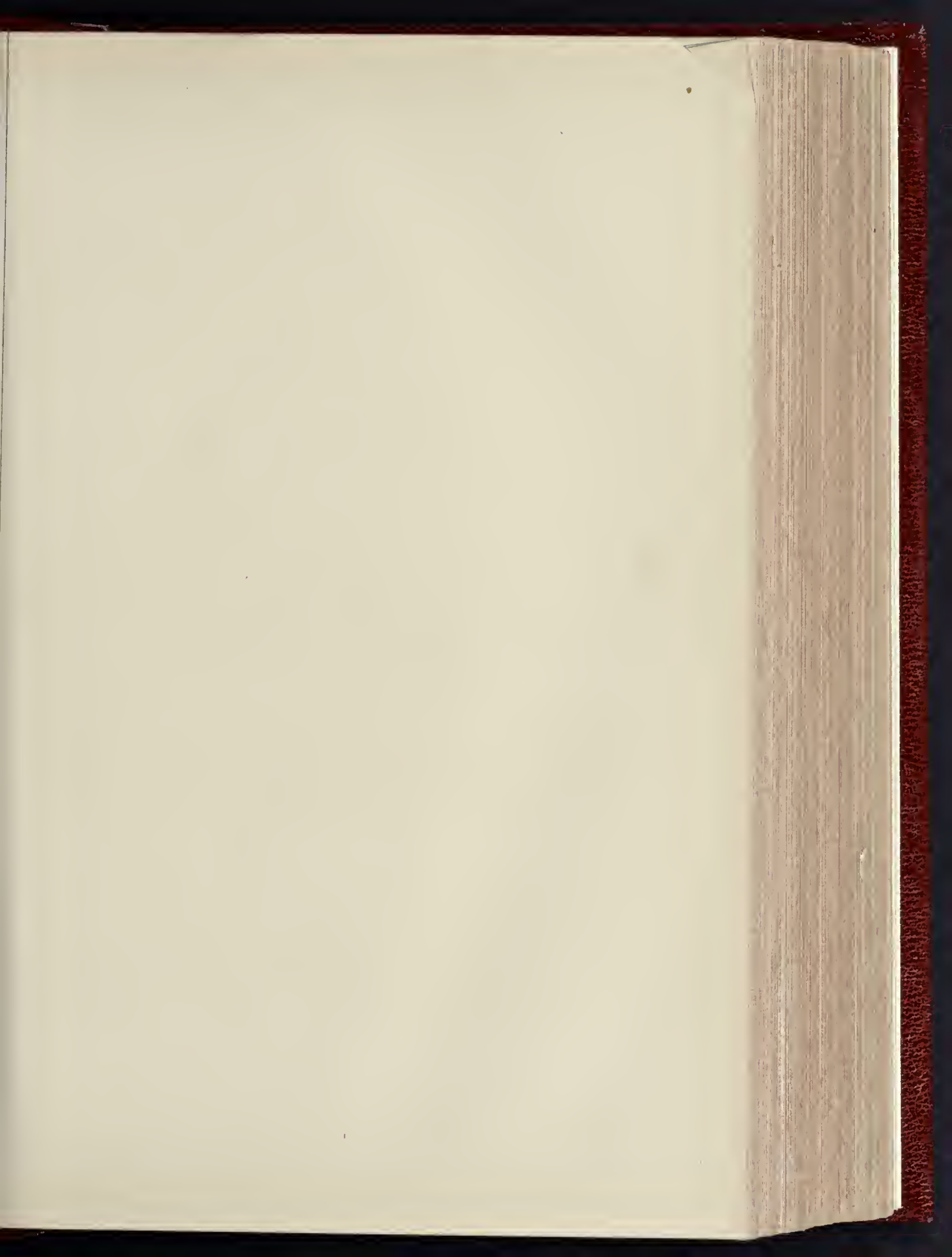
21,493.—BALL-AND-FLY VALVES: *F. J. Brazier.*—The float is arranged so that it shall slide in a vertical direction between guides upon the end of the outlet pipe, whilst levers which are pivoted on to a casing at the end of the pipe join the float to a lug that projects from beneath the valve; by those means the movement of the float is communicated, to a lessened extent, to the valve which is seated upon the outlet of the pipe. In a variant adaptation a partial or entire balancing of the valve is obtained by extending the valve downwards in order that the lower end may operate as a piston in a corresponding extension of the casing into which the water flows through a port within the valve.

21,530.—LADDERS, STEP-LADDERS, AND TRETTLES: *A. Barr.*—The three sections of a telescopic ladder are fixed with weighted hooks when it is fully extended, the hooks being pivoted on to the upper two sections and fitting over the rungs of the lowest section. Anti-friction rollers press against the wall, and the sections are retained in their places with guide-rollers. For a trestle or step-ladder in two sections the sides are pierced with holes through which side-struts are to be hooked, and there are holes in the sections for a hinge-pin or bolt; a horizontal notched bar that engages with the rungs fastens the sections when they are extended; the ladders, &c., being after the cover like an extensible kind, are such as are specified in No. 21,183 of 1896.

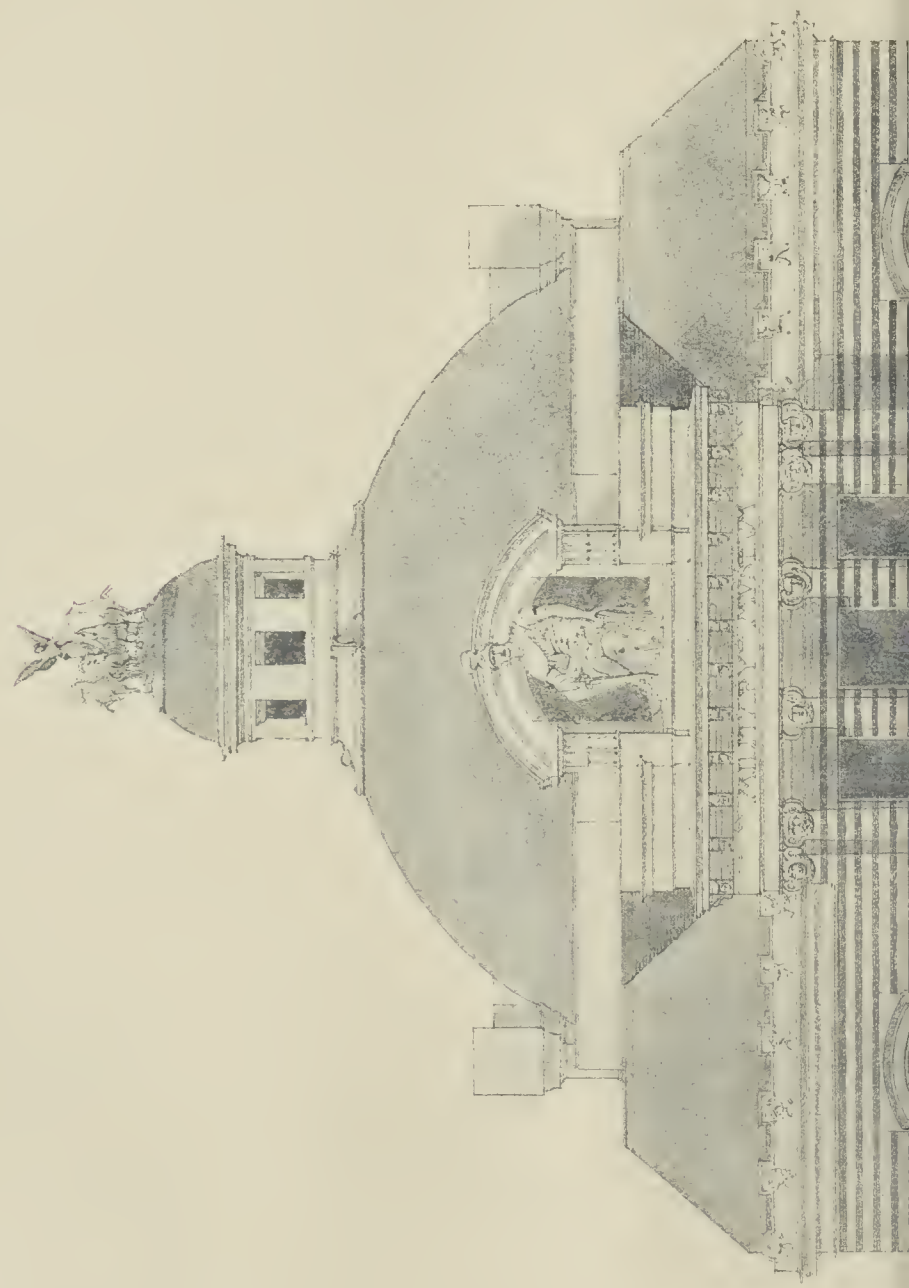
21,537.—STEELYARDS: *W. E. Hipkins.*—The steelyard is adapted for use with weighing-bridges and platform machines, and embodies a compound-lever adjustment; to the steelyard is secured a notched bar, which is engaged by a supplementary nib mounted upon the poise. Any damage of the steelyard by the nib is obviated by cutting the notches upon the auxiliary bar more deeply than the notches upon the steelyard itself. Nor will the steelyard suffer injury when both nibs are in position for engagement with their notches respectively.

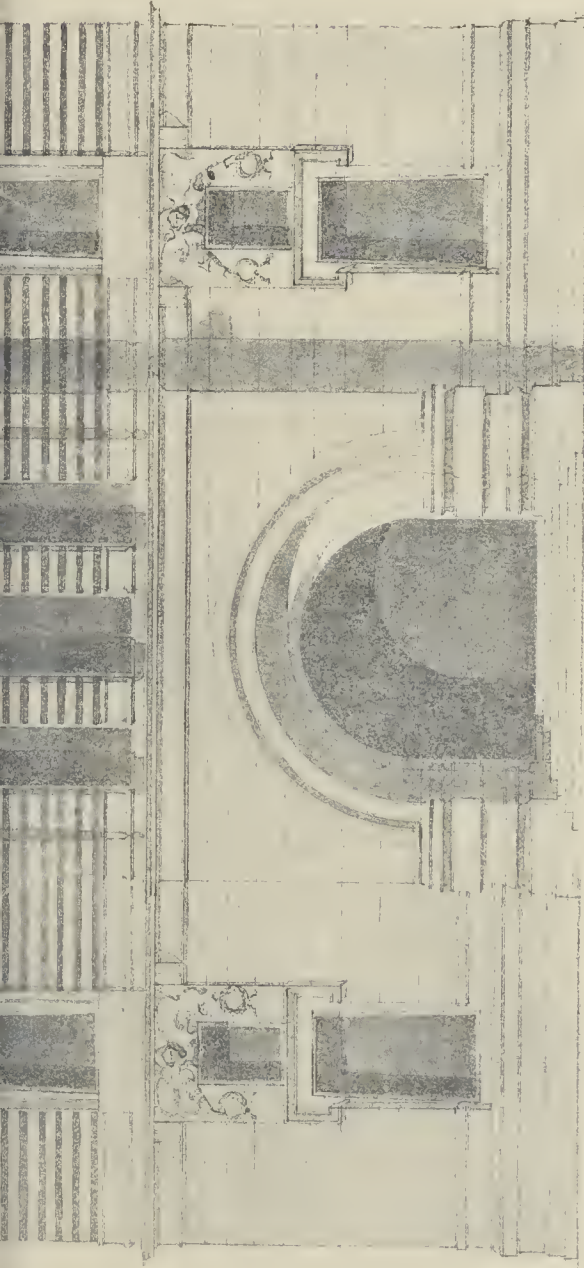
21,683.—AN APPLIANCE FOR SCOURING AND CLEANING PIPES AND CONDUITS: *F. Novotny and O. Mierisch.*—For a guide and piston an oval-shaped body is put within the pipe or conduit; a scraping instrument and a brush are attached to the guiding portion, the brush or ribs of the scraper being set at an angle to the longer diameter of the appliance in order that it may rotate as it is drawn through the pipe; the brush sweeps away the dirt, &c., which the scraper removes as the apparatus is being forced through the pipe by means of compressed steam or other fluid.

21,710.—PROCESS OF MOULDING SINKS, &c.: *J. Woodton and J. Parker.*—A loose ring or mould is



THE BUILDER. MARCH 2, 1901.



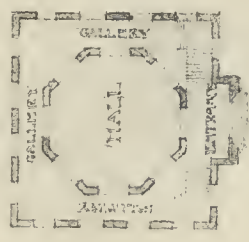


DESIGN FOR FACADE OF A MILITARY MUSEUM



SCALE 1/4" = 1'-0"

PLAN



J. H. SPAIN, ARCHITECT

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

L. N. 10

mounted upon the die or mouthpiece of a pipe-making or extrusion machine, and reposes upon bevelled ribs of the balanced table, which also carry a core that is secured to a rod. After the table has been freed from its locked position, and as it descends, the suspension bolts limit the amount of the fall of the mould, so that a cutting-off wire can be drawn between the mould and the die. If it be desired to form ornamental designs around the sink or other article, loose pattern-plates should be inserted at the sides of the mould.

21,746.—COVERS FOR MANHOLES: T. P. G. Egger. A flange which has gates arranged at regular intervals affords support for a circular grating; in the rim of the cover are fashioned half-round recesses which will, or will not, register (as may be desired for purposes of ventilation) with the gates in the flange, as a projection engages with one or with the other of two other recesses.

21,779.—MANUFACTURE OF LIME CEMENT: C. Straub.—Moisture is expelled from calcined limestone that has been partly hydrated by heating it in an oven or upon a hot plate. The broken lumps of limestone are then pulverised, and the resultant lime cement is then pulverised, and the resultant lime is mixed with sand for mortar. When finely sifted and compounded with a colouring material, it may be used as a wall paint. Steam of water can be employed for the process of hydration. The water may be mixed with a glue or gum solution, calcium sulphate, or alkaline salts of boracic or other acid.

MEETINGS.

FRIDAY, MARCH 1.

Architectural Association.—Mr. E. W. M. Wonnacott on "The Paris Exhibition, 1900." 7.30 p.m.
Royal Institution.—Mr. H. H. Conyngham, C.B., on "Enamels." 9 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. R. Kenwood on "Water: Composition, Pollution, and Purification." 8 p.m.
Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Carburetted Water Gas," by Mr. Samuel Cutler, Jun. 8 p.m.

SATURDAY, MARCH 2.

Royal Institution.—The Right Hon. Lord Rayleigh, on "Sound and Vibrations." 11. 3 p.m.
British and Certified Carpenters (Carpenters' Hall, E.C.).—Mr. W. H. Betamens on "Wood Beams: their Properties and Design." Professor R. E.ley Smith, Vice-President, will take the chair. 6 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Islington Disinfecting Station. 6 p.m.
Edinburgh Architectural Association.—Visit to Glasgow International Exhibition Buildings.

MONDAY, MARCH 4.

Society of Engineers.—Paper by Mr. G. J. G. Jensen, entitled "Notes on certain Details of Drainage Construction." 7.30 p.m.
Cold Storage and Ice Association (Fishmongers' Hall).—Mr. P. F. Kensett on "Practical Insulation." 30 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. R. Kenwood on "Elementary Statistics." 8 p.m.
Liverpool Architectural Society.—Professor Beresford to read "The Architectural Treatment of Stone-work."
Leeds and Yorkshire Architectural Society.—Mr. Lewis Lucas on "Logical Building and its influence on Architecture." 6.30 p.m.

TUESDAY, MARCH 5.

Institution of Civil Engineers. Messrs. W. H. Ranger and Bertram Blount on "The Rotatory Process Cement Manufacture." 8 p.m.
Society of Arts (Applied Art Section).—Mr. Richard Wade on "Early Playing Cards and their Decoration." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

WEDNESDAY, MARCH 6.

Royal Archaeological Institute of Great Britain and Ireland.—Mr. C. E. Keyser, M.A., F.S.A., on "Tympana of Norman Doorways in our English Churches." 4 p.m.
British Archaeological Association.—Rev. H. J. D. Eley, M.A., on "A Ramble Round Hereford." 8 p.m.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Soap Works. 3 p.m.

THURSDAY, MARCH 7.

Royal Institution.—Professor Percy Gardner, F.S.A., on "Greek and Roman Portrait Sculpture." 11. 3 p.m.
Carpenters' Hall, London Wall.—Mr. John Slater, (London) on "Celebrated Ancient Buildings." 8 p.m.
Society for the Encouragement of the Fine Arts.—Mr. C. E. Keyser, F.S.A., on "Sculptured Tympana of Norman Doorways." With limelight illustrations. 8 p.m.
Institution of Junior Engineers.—Mr. A. H. Barker, on "Works Management." 11. 8 p.m.
Civil and Mechanical Engineers' Society.—Mr. J. Bell on "Authoritative Rules for Unit-stresses in Laid Girders." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Eley Smith on "Building Materials." 8 p.m.
Institution of Electrical Engineers (at the Institute on Mill Engineers).—Mr. M. O'Gorman on "Insulation Tables." 8 p.m.
Institution of Electrical Engineers (Dublin Branch).—Visit to the Dublin United Tramway Company's Power station at Ringsend. 3 p.m.

FRIDAY, MARCH 8.

Architectural Association.—Special general meeting to order the Committee's scheme for the establishment of classes. 7.30 p.m.

Royal Institution.—Mr. W. A. Shenstone, F.R.S., on "Vitrified Quartz." With experimental illustrations. 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. C. Johnston on "Sewage Treatment." 8 p.m.
Glasgow Architectural Craftsmen Society.—Mr. J. Lochhead on "The Decay of Building Materials." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Professor T. Roger Smith on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions." 8 p.m.

SATURDAY, MARCH 9.

Royal Institution.—Right Hon. Lord Rayleigh, on "Sound and Vibration." 11. 3 p.m.
Institution of Junior Engineers.—Visit to the Southall Station of the Brentford Gas Company to inspect the carburetted gas plant, inclined retorts, &c. 3 p.m.
Dundee Institute of Architecture.—Mr. C. G. Sontar on "Ecclesiastical Architecture in Fifehire." With limelight illustrations. 7 p.m.
Edinburgh Architectural Association.—Visit to Archers' Hall and Craigmill Park United Free Church.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Beddington Sewage Farm. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 16.—By HAMPTON & SONS (at Wimbledon).
Wimbledon.—Burghey-rd., thirteen building sites, f. 1,425
Marryat-rd., five building sites, f. 1,425
Marryat-rd., three corner building sites, f. 1,593
February 17.—By DEVERELL & HILL.
Kingsland.—13 and 15, Hertford-rd., ut. 493 yrs., g.r. 304, f. 741.
By WOODS & SNELLING.
Battersea.—Carpenter-st., f.g.r.'s 401, reversion in 80 yrs., f. 1,255
Hoxton.—10, Dorchester-st., ut. 432 yrs., g.r. 154.
By ALFRED RICHARDS (at Tottenham).
Tottenham.—27 to 35 (odd), Birbeck-rd., f. r. 1,564.
Edmonton.—20 and 24, Church-st., f. r. 657.
February 19.—By HAMPTON & SONS.
Hyde Park.—5, Stannopet-st. and 7, Sussex-mews West, ut. 34 yrs., g.r. 214, 10s.
Dayswater.—3, Kildare-gardens, ut. 59 yrs., g.r. 91, e.r. 804.
Harrow-on-the-Hill.—The Park, Parkfield, and 48, f. r. 6,000.
Westcliff-on-Sea, Essex.—Hamlet Court, Fenotee, beneficial lease for 94 yrs., r. 604.
By PERCIVAL HODSON.
Wandswoth.—24, Malvern-rd., ut. 62 yrs., g.r. 31, f. r. 324.
34, St. Anne's Hill, ut. 62 yrs., g.r. 31, 4s.
6 to 16 (even), Warple-rd., ut. 65 yrs., g.r. 157.
7 to 10, Elizabeth-st., f. r. 2,010.
By NORLEY & CO.
Whitechapel.—Great Prescott-st., f.g.r. 451, reversion in 31 yrs., f. 1,203.
By MESSRS. THOLLORE.
South Kensington.—2, Lenthall-mews, ut. 61 yrs., g.r. 204.
By WESTON & SONS.
Brixton.—81 and 83, Loughborough-rd., ut. 22 yrs., g.r. 41, f. 264.
Kennington.—109 to 113 (odd), Warham-st., f. r. 99 to 105 (odd), St. Mark's-rd., f. r. 99 to 126 (even), Farmer's-rd., f. r. 461.
Brixton.—35, Angell-rd., ut. 564 yrs., g.r. nil, f. r. 461.
Herne Hill.—270 and 272, Milkwood-rd., ut. 65 yrs., g.r. 91, f. r. 641.
Anerley.—Anerley Vale, f.g.r. 317, 10s., reversion in 50 yrs.
Anerley Vale, l.g.r. 157, 15s., ut. 57 yrs., g.r. 44.
By C. H. WHITE.
Chelsea.—47, Shaftesbury-rd., ut. 51 yrs., g.r. 71, 10s., r. 501.
Brixton.—24, Trent-rd., ut. 81 yrs., g.r. 91, f. r. 534.
47, 49, and 51, Trent-rd., ut. 81 yrs., g.r. 271, f. r. 1,184.
By MATTHEW MILES (at Masons' Hall Tavern).
Kenington.—Charles-st., the Builder's Arms p-h., ut. 104 yrs., f. 1,504, with goodwill.
February 20.—By EDWIN W. HARRIS.
Penge.—2, 4, 6, and 8, Evelin-rd., ut. 75 yrs., g.r. 204.
Balham.—55, High-rd., ut. 784 yrs., g.r. 181, f. r. 1751.
By MARLER & MARLER.
Hyde Park.—5, Chester-pl., ut. 304 yrs., g.r. 61, f. r. 2,001.
By ORRILL, MARKS, & LAWRENCE.
Regent-st.—Beak-st., The Coffee House Tavern, a leasehold rental of 1004, reversion in 30 yrs.; also 54A, Marshall-st., adjoining, f. r. 4,500.
By WHITE, BERRY, & TAYLOR.
Pimlico.—45, Cambridge-st., ut. 26 yrs., g.r. 18, f. r. 821.
33, Cambridge-st., ut. 37 yrs., g.r. 71, f. 651.
By DOUGLAS YOUNG & CO.
Sout's Lambeth.—28 and 29, Mawbey-st., ut. 594 yrs., g.r. 101.
Brixton.—Nursery-rd., f.g.r. 154, reversion in 73 yrs.
Electric-lane, stabling and premises; also l.g.r.'s 381, ut. 29 yrs., l.g.r. 301.
East Ham.—1, Rainier-gate-rd., ut. 754 yrs., g.r. 101, 10s.
Ilford, Essex.—56, Mansfield-rd., ut. 992 yrs., g.r. 71, 3s., f. 381.
Battersea.—51, Queen's-rd., ut. 76 yrs., g.r. 91, 9s., f. 501.
February 21.—By G. F. BOX & CO.
Sreatham.—30, Hopton-rd., ut. 80 yrs., g.r. 381, e.r. 504.

By G. PEARCE & SONS.
Hoxton.—71, New North-rd., ut. 141 yrs., g.r. 311, e.r. 851.
55 and 57, Shaftesbury-st., ut. 594 yrs., g.r. 311, f. r. 1741.
Islington.—6, Southgate-rd., ut. 254 yrs., g.r. 11, 8s., f. 401.
175, Southgate-rd., ut. 304 yrs., g.r. 61, f. 401.
Lambeth.—22, 23, and 24, Doon-st., and 20, 21, and 21A, Bazon-st., ut. 8 yrs., g.r. 131, 10s.
38 and 30, Sutton-st., ut. 12 yrs., g.r. 131, 5s.
By WORSFOLD & HAYWARD.
Chelsea.—48, King's-rd., ut. 50 yrs., g.r. 61, f. 401.
49, Sydney-st., ut. 234 yrs., g.r. 61, f. 551.
By NEWSON, EDWARDS, & SHEPHERD.
Marylebone.—35, Thayer-st., ut. 61 yrs., g.r. 701, f. 1101.
Kingsland.—1 to 19 (odd), Abbott-st., f. r. 2,100.
Islington.—115, Essex-rd., ut. 10 yrs., g.r. 125, f. 361.
Highbury.—127, Highbury New Park, ut. 50 yrs., g.r. 101, 4s., e.r. 901.
Holloway.—46, Holloway-rd., f. r. 454.
Wealdstone, Middlesex.—Rosslyn-cres., f.g.r.'s 241, reversion in 984 yrs.
By SPINSON & SONS.
Finsbury.—14, 15, and 16, Whitecross-pl., f. r. 1,300.
Brixton.—42 and 44, Mordaunt-st., ut. 614 yrs., g.r. 101.
Ball's Pond.—2 to 20 (even), B shop's-grove, ut. 614 yrs., g.r. 61.
Lambeth.—131, Lambeth-walk, ut. 9 yrs., g.r. 101, 10s., f. 701.
36, Albert Embankment, ut. 44 yrs., g.r. 254, f. r. 1751.
18, Johanna-st., ut. 194 yrs., g.r. 31, 12s. 6d.
Kennington.—35, Kennington-rd., ut. 604 yrs., g.r. 81, to 1916 and 101, thereafter, e.r. 501.
By BAYLTON & SONS (at Horse Shoe Hotel).
Stoke Newington.—High-st., the Victoria p-h., with goodwill; also 2, 4, 6, and 8, Victoria-grove, f. r. 24,000.
Southwark.—Borough High-st., the Tabard p-h., ut. 284 yrs., r. 1,001.
By HOOKER & WENN (at Croydon).
Whyteleaf, Surrey.—7 to 12, Welcome-ter., f. r. 2,515.
By G. A. McDOWELL (at Stratford).
Victoria Dock.—9, 11, and 13, Wightman-st., f. r. 715.
Plaistow.—43 to 49 (even), Barkingside, f. r. 1,500.

February 22.—By HORSB & CO.
Holborn-circus.—15 to 20, Mly-pl.; 1 to 13, Ely-buildings, area 14,918 ft. 2, f. r. 1,650.
Contracts used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; ut. for unexpired term; pa. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table with columns for material types (e.g., Bricks, Hard Stocks, Rough Stocks, Smooth, Facing Stocks, Shippers, Flettons, Red Ware Cuts, Best Farnham Red, Best Red pressed, Ruabon Facing, Best Blue Pressed, Staffordshire, Do., Bournemouth, Best Stourbridge, Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Best Dipped Salt Glazed Stretchers and Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Splays, Chamfered, Squints, Seconds Quality White and Dipped Salt Glazed) and their respective prices per unit.

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.
Grey Stone Lime 13s. 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 22s. 6d. per ton at fly, dpt.
[See also page 225.]

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.			
Nature of Work.	By whom Advertised.	Premiun.	Designs to be delivered
Public Library	Keighley Corporation	50L, 30L and 20L	April 30

CONTRACTS.			
Nature of Work or Materials.	By whom Required.	Form of Tender, &c., Supplied by	Tenders to be delivered
Dynamo House, &c., at Workhouse	Barnsley Guardians	H. Crawshaw, Architect, 13, Regent-street, Barnsley	Mar. 5
Two Villas, Bawtry, Yorks	Mr. J. Howard	Brooks & Kelly, West View, Pontefract	do.
Chapel, near Beverley, Yorks		J. C. Petch, Architect, Bank Chambers, Scarborough	do.
Workshops, Ruchill Park	Glasgow Corporation	A. B. McDonald, Engineer, Office of Works, Glasgow	do.
Banking Premises, Thorpe Buildings	Halifax Commercial Banking Co.	T. Stevens, Town Hall, Bradford	do.
Electricity Station, Valley-road	Weiwyn (Heris) Guardians	T. J. Sworder, Union Offices, Weiwyn	do.
Additions to Workshops	Manchester Corporation	Secretary, Waterworks Office, Town Hall, Manchester	do.
Two Cottages and Stores, Worsley, &c.	Great Western Railway Company	G. K. Mills, Fiddington Station, W.	do.
Passenger Station, &c., Littlemore, Oxon	Messrs. W. Kirkham & Sons	Scrivener & Sons, Architect, Hanley	do.
Shiphouse and Workshops, Stoke-on-Trent	Mountain Ash (Glam.) U.D.C.	J. Williams, Surveyor, Town Hall, Mountain Ash	do.
Street Works, near Railway Station	Whitehaven Corporation	Borough Engineer, Town Hall, Whitehaven	do.
Chimney Shaft, West-strand	Amble U.D.C.	W. Gibson, Surveyor, 21, Queen-street, Amble	do.
Cast-iron Pipes	Handsworth (Staffs.) U.D.C.	H. Howard, Surveyor, Town Offices, Council House, Handsworth	do.
Ragstone	Hambleworth (Staffs.) U.D.C.	Surveyor, Town Hall, Waltham Green, S.W.	Mar. 6
Making-up Cannel	Fulham Borough Council	W. B. Seldon, Town Hall, Bideford	do.
Cottage of Reservoir, Gannatton	Bideford Town Council	J. O'Neill, North Brunswick-street, Dublin	do.
Fourteen Cottages, Howth	North Dublin R.D.C.	S. A. Pickering, Civil Engineer, Town Hall, Oldham	do.
Kerbs, Flags, Setts, &c.	Heaton Norris U.D.C.	H. Goodyear, Civil Engineer, Borough Engineer, Colchester	do.
Surveyor's Materials	Oldham Corporation	do.	do.
Derbyshire Lime (450 tons)	Colchester Corporation	do.	do.
York Kerbs and Flags, Granite, &c.	West Lancashire R.D.C.	C. Law-Grave, Civil Engineer, Union Offices, Wigan-rd., Ormskirk	do.
Paving Works, Ormskirk		Barber, Hopkinson & Co., Architects, Keighley	do.
Residence, Utley, Yorks	Felixstowe U.D.C.	G. S. Horton, Surveyor, Town Hall, Felixstowe	do.
Street Works, Leopold-road, &c.	Plympton Guardians	E. A. Clark, Architect, Old Town-street, Plymouth	Mar. 7
Additions to Workhouse, Underwood	Dr. Thos. Finney	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Additions, &c., to Aberaman-Uchaf, Aberdare		Rhymney Building Company	do.
Six Houses, Berry Brow, Huddersfield	Sheffield Corporation	J. L. Smith, Architect, 50, High-street, Merthyr Tydfil	do.
Nineteen Villas, Rhymney, Mon.	Littlehampton U.D.C.	C. F. Wike, Civil Engineer, Town Hall, Sheffield	do.
Lodge, &c., Brightside	Brymbo School Board	D. Davies & Moss, Architects, 2, Temple-row, Wrexham	do.
Brick Pavine, &c., Esplanade Extension		L. H. Arnour, Architect, 16, West-street, Gateshead	do.
Additions, &c., to Vron Schools, near Wrexham		J. Kirk & Sons, Architects, Huddersfield	Mar. 8
Business Premises, East-boulevard-avenue, Gateshead		H. Nonrish, Histon-on-the-Hill, Billingham	do.
Two Streets, Lixley, Huddersfield		R. J. Bewick, Architect, 35, Regent-street, Swindon	do.
Clunnona, Histon-on-the-Hill, Leics.	High Wycombe R.D.C.	W. Brook, Town Hall, Ossett	Mar. 9
Field Flints (9,710 yards)	Dr. R. H. Dale	R. Burlam, Borough Surveyor, Town Hall, Congleton	do.
Stores, Stabling, &c., Swindon	Ossett (Yorks) Corporation	C. H. Marriott & Co., Civil Engineers, Dewsbury	do.
Sewerage Works	Congleton (Cheshire) Town Council	C. J. Lomax, Civil Engineer, 37, Cross-street, Manchester	do.
Welsh Granite, &c.	Hunslet R.D.C.	J. Northey, Surveyor, Lake Lifton	do.
Extension of Sewerage Works, Halton	Fairwath (Lancs) U.D.C.	A. Herbert, Estate Agent, Andover	do.
Laying-out Ground, Breinage, &c.	Tavistock R.D.C.	R. Morgan, 215, High-street, Treorchy	do.
Iron Bridge over Tavy, Horndon Clam		G. Morris, High-street, Fishguard	do.
New Road, Andover		Managers	Mar. 11
Chapel, School, &c., Treorchy, Wales		Gateshead School Board	do.
School Buildings, Fishguard, Pembroke		do.	do.
School, Kelvingrove		Rathdrum R.D.C.	do.
School, Teams		Dungarvan (Ireland) U.D.C.	do.
Water Supply Works, Aighrim		Garston U.D.C.	do.
Service Reservoirs, Water Malins, &c.		Warmminster (Wilts) U.D.C.	do.
Quay Wall		Luton R.D.C.	do.
Six Villas, &c., Elm-road, Leich-on-Sea		Worsley (Lanes) U.D.C.	do.
Macadam, Setts, &c.		Beckenham U.D.C.	do.
Technical Schools		Bristol Electrical Committee	Mar. 12
Water Supply Works, Stopley		Brimley U.D.C.	do.
Sewerage Works		Bath U.S.A.	do.
Council Chamber, &c.		Metropolitan Police District	do.
Superstructure of Avonbank Electricity Works		Cromer U.D.C.	do.
Widening of London-lane		L. & S. W. Railway Company	Mar. 29
Road Stone		Edmonston School Board	do.
Fifteen Cottages, Strabane, Ireland		Carlton U.D.C.	do.
*Repairing, &c.		Metropolitan Asylums Board	do.
*Sewers		Fulham Borough Council	Mar. 22
*Hotel, Dianbradach, Glam.		Office of Works	do.
*Army Medical Stores		Norton School Board	Mar. 25
*School at Rayburn-road		Warrington Corporation	do.
*Engine House, &c.		Townsend & Longbottom	do.
*School			do.
*Granite, Paving, &c.			do.
*Enlargement of Post Office			do.
*School			do.
*Sewers, &c.			do.
*Heating			do.
Two-kill Oast & Buildings, Harbledown, Canterbury			do.
Three Cottages, Park-lane, Keighley			do.
Licensed Premises, Black Swan, Leeds			do.
Alterations to Masons Arms, St. James-street, Leeds			do.
Alterations to Benaiah Chapel, Talybont-on-Usk			do.
Six Houses, Harsnet-road, Colchester			do.
Club Premises, off Mottram-road, Stalybridge			do.
Hotel, Front-street, Stanley, Durham			do.
Warehouses, Old-street, E.C.			do.
Surveyor's Materials			do.
Extension of Jurel's Wharf, Southampton			do.
Additions to St. James' School, Waterfoot, Lancs.			do.

PUBLIC APPOINTMENTS.			
Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Road Surveyor	Birmingham Corporation	150L per annum	Mar. 9
*Junior Draughtsman	Metropolitan Asylums Board	2L per week	Mar. 12
*Building Inspector	Tottenham U.D.C.	150L per annum	Mar. 19

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.

PRICES CURRENT (Continued).

Table listing prices for stone materials including Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, etc.

SLATES.

Table listing prices for slates such as best blue Bangor, best second, best blue Portman, etc.

TILES.

Table listing prices for various tiles including plain red roofing tiles, hip and valley tiles, etc.

WOOD.

Table listing prices for building wood, yellow, such as best 3 in. by 11 in. and 4 in. by 9 in., etc.

JOINERS' WOOD.

Table listing prices for joiners' wood including te Sea: First yellow deals, 3 in. by 11 in., etc.

Table listing prices for various types of wood such as regular sizes, reds (2 in. and up), etc.

PRICES CURRENT (Continued).

Table listing prices for wood materials including Dry Walnut, American, per ft. sup., Teak, per lb., etc.

JOISTS, GIRDERS, &c.

Table listing prices for joists and girders such as Rolled Steel Joists, ordinary sections, Compound Girders, etc.

METALS.

Table listing prices for various metals including Common Bars, Staffordshire Crown Bars, Mild Steel Bars, etc.

Table listing prices for lead and zinc materials such as LEAD-Sheet, English, 3 lb. & up, Zinc, Sheet, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English sheet glass in crates in various sizes like 15 oz. thirds, 2 1/2 ft. delivered, etc.

OILS, &c.

Table listing prices for oils such as Raw Linseed Oil in pipes, Turpentine in barrels, etc.

VARNISHES, &c.

Table listing prices for various varnishes including Fine Elastic Copal Varnish for outside work, Best Hard Oak Varnish, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

TENDERS.

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

BANEURY.—For the supply of Harthill stone for one year, for the Town Council. Mr. N. H. Dawson, C.E., Town Hall, Baneury.—

BELVEDERE (Kent).—For the erection of new board offices, cookery centre, drainage work and sanitary additions to school, for the Brith School Board. Messrs. Ford, Son, & Barrow, architects, 21, Aldermanbury, S.E. Quantities supplied:—

BIRMINGHAM.—For making-up, &c., Livingstone-road, King's Heath, for the Urban District Council:—

CARDIFF.—For the erection of shops, &c., Queen-street, Messrs. Teather & Wilson, architects, Queen-street, Cardiff:—

CUPAR FIFE, N.B.—For the construction of a brick and concrete reservoir, Rires Hill. Mr. Henry Bruce, C.E., County Buildings, Cupar Fife:—

DUNOON.—For road-widening, &c., West Bay, Dunoon. Mr. Chas. J. M. Mackintosh, C.E., Burgh Engineer, Dunoon:—

DUNOON, N.B.—For the erection of a steel girder bridge, Balgie Burn, West Bay, for the Commissioners. Dunoon. Quantities by engineer:—

LEEDS.—For the erection of St. Anne's Cathedral, Leed., Mr. J. H. Eastwood, architect, Kensington, W. Quantities by Mr. G. Evans, 10, Duke-street, Adelphi:—

[See also next page.]

HENDON.—For fully making up Pattison-road and Church-terrace; surface water drainage, Parson-street, Church End, and Church-road; new road, The Hyde, &c., for the Urban District Council of Hendon. Mr. S. Slater Grimley, Engineer and Surveyor:—

	Pattison-road.	Church-terrace.	Surface Water Drg. Parson-st., &c.	Finchley-road.	Victoria & Stratford-rd. Second Avenue.	The Hyde (new road).	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
F. H. Jackson.....	1,937 14 4	646 10 0	554 14 5	470 1 0	513 12 6	687 10 0	4,712 11 8
W. Griffiths.....	1,593 17 8	637 2 5	652 7 3	282 10 9	401 10 0	672 10 0	4,239 18 1
J. Meston.....	1,528 10 6	622 17 10	668 1 0	305 9 3	372 10 8	677 19 0	4,075 14 3
Myers, Gilson, & Rose.....	1,482 7 1	593 1 0	666 14 0	295 18 2	356 10 0	579 1 7	3,013 12 7
H. Boyer.....	1,030 0 0	589 0 0	627 0 0	335 0 0	417 0 0	510 0 0	3,807 0 0
T. Adams, Wood Green.....	1,909 3 5	459 7 0	637 6 0	286 17 2	361 18 4	418 1 2	3,665 13 11
R. Hallard, Ltd., Child's Hill.....	1,330 8 6	544 8 6	539 13 6	303 12 6	367 5 0	491 12 0	3,577 0 0
Wallace & Inns.....	—	—	—	—	396 10 0	—	396 10 0
Surveyor's estimate.....	1,365 16 4	572 4 10	586 17 4	290 12 7	328 13 6	500 0 0	3,844 4 7

LEEDS.—For the erection of Primitive Methodist church and school, Ladyfit-lane, Beeston Hill. Mr. W. C. Smithson, architect, 13, Bond-street, Leeds. Quantities by architect:—
 Bricklaying and Masonry.—Joseph Pullan, Beeston, Leeds..... £4,595 0
 Carpentry and Joinery.—Joseph Pullan, Beeston, Leeds..... 942 10
 Plumbing.—J. W. Vine, Queen's-square, Leeds..... 206 10
 Plastering.—J. H. Brooks, Armley, Leeds..... 115 0
 Slating.—J. Dickinson, Beeston Hill, Leeds..... 70 0
 Iron and Steel Work.—Perkin & Co., Ltd., Leeds..... 131 0
 Painting.—H. Lambert, Leeds..... 60 0
 £2,993

LONDON.—For the erection of children's home, Aliman-street, S.W., for the Guardians of St. George. Mr. E. T. Hall, architect, 57, Moorgate-street, E.C. Quantities by Mr. T. M. Deacon:—
 M. Pearson..... £19,275
 Sabey & Son..... 18,167
 Shillito & Sons..... 17,100
 R. L. Tonge..... 16,920
 Foster Bros..... 16,669
 Perry Bros..... 16,813
 Hibberd Bros..... 16,710
 J. Appleby..... 16,599
 W. S. Beaton..... 16,525
 C. Gray Hill..... 16,400
 W. J. Renshaw..... 16,392
 Marriage & Withington..... 16,360
 Leslie & Co..... £16,270
 Messon & Sons..... 15,953
 Harris & Wardroon..... 15,597
 Braid, Pater, & Co..... 15,200
 Johnson & Sons..... 15,031
 H. L. Holloway..... 14,979
 Gough & Co..... 14,454
 Kingler & Sons..... 13,967
 Rugby..... 12,917
 W. Smith..... 12,708

LONDON.—For alterations to the Crown Tavern, York-road, N., to adapt it for cabinet works. Mr. Alex. G. Wordley, surveyor, 8, Duke-street, Adelphi, W.C.:—
 Brown & Son..... £825
 E. Bransgrove..... 685
 Leath & Harris..... £672
 J. D. Hobson..... 668

LONDONDERRY.—For the erection of two villa residences, Northland-road. Mr. E. J. Toye, architect, Strand, Londonderry:—
 Maultsald & Pollock, Orchard-street, Derry..... £1,650

C. B. N. SNEWIN
 MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.
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 Telephone, No. 274 Holborn. Tele. Address: "SNEWIN London."

SUTTON.—For the erection of a cottage hospital at Sutton, Surrey. Mr. Cecil A. Sharp, architect, 11, Old Queen-street, Queen Anne's-gate:—
 Smith & Son..... £2,510
 Huntley Bros..... 2,483
 F. J. Shepland..... 2,470
 J. B. Potter, Sutton..... 2,045
 [Exclusive of additional items to be added at the option of the committee, which bring the amount of the lowest accepted tender to £2,500.]

WHITBY.—For the erection of electric light station and destructor, for the Urban District Council. Messrs. Preece & Cardew, engineers. Messrs. Hubbard & Moore, architects. Quantities by Mr. Alexander H. Kinder:—
 F. G. Minter £5,664 0 0
 Parker & Sharp £5,208 15 2
 Jaram & Son 6,379 10 0
 J. F. Wilson... 6,252 1 6
 J. Humphry..... £2,270
 E. J. Burdard..... 2,132
 J. B. Potter, Sutton..... 2,045
 [Exclusive of additional items to be added at the option of the committee, which bring the amount of the lowest accepted tender to £2,500.]

TERMS OF SUBSCRIPTION.
 "THE BUILDER" published Weekly is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum (25 numbers) PREPAID. For all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances payable to DOUGLAS BOURNEMOUTH should be addressed to the publisher of "THE BUILDER," Colindale-street, W.C.
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VOL. LXXX.—No. 3931.

MARCH 9, 1931.

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Some Plain Truths in regard to the London Water Question.

THE total collapse of the London water companies, who, after suggesting an interval of a week in the Local Government Board Inquiry in order to consider whether they could modify any of their demands, at the end of that time withdrew them entirely, was a dramatic termination to the inquiry hardly expected by even the most sanguine opponents of the policy of the companies. The fact that they could have felt under the necessity of taking this course, after the drastic and wholesale demands put forth in their recent ultimatum for revised regulations, is a blow to their prestige from which they will not readily recover, and shows how fully they must have felt compelled to realise the general and determined nature of the opposition which their attempt at forging new fetters for the London householders has aroused. In fact, had Government made any attempt to enforce these regulations there would have been something like a publicurrection. That the water companies, whose prolonged existence has for some time been threatened, and who have become more and more unpopular of late years, could have chosen the present juncture to throw their hand in this way, and to formulate demands that would give them an absolutely tyrannical power over those who are necessarily their customers, seems like a vivid illustration of the old proverb—*Quos vis nulli perdere, prius dementat*. It is no purpose to say that under any system of water supply it would be necessary that a strong official inspection should be maintained over fittings, in order to prevent waste. Unless supply were by meter on which point we may have a word to say further on—such inspection would no

doubt be necessary ; but it is one thing to have inspection carried out in the interests of the public and by a public authority, and another thing to have it carried out by a private trading company in the interests of their shareholders. The mere fact that the supply of a necessary of life and health, like water, to the largest and most crowded city in the world, should be in the hands of private companies who are trading in it to their own advantage, is an anomaly so monstrous that it is a wonder that public opinion has not long since risen up in arms against the continuance of such a system. As to the pretence put forward by the representatives of the water companies at the recent inquiry, that their proposed regulations were for the good of the consumers, the statement involves such a degree of unblushing impudence as one can hardly adequately characterise in parliamentary language. They know perfectly well, for example, that the storage of water for family use in large cisterns has been condemned by all hygienic authorities as leading to insanitary conditions, and yet they expect us to believe that in trying to compel the use of larger cisterns than ever, so as to enable them to interrupt constant supply whenever it is convenient to them, they are actuated only by consideration for the convenience of their customers! It is not worth while to refer to other similar points in the evidence offered to the Local Government Board Commissioners ; it is all in the same strain, and offers an example of cynical indifference to public opinion which seems almost incredible.

The plain truth of the matter is that, partly owing to this false position of the water companies as traders in a necessary of life, and the influence they possess in many quarters,* the question of London water supply has come to be regarded and treated almost entirely as a political stalking-horse. We scarcely ever come across an utterance on the subject which, if traced to its

* It is perfectly obvious, for instance, that some important journals, for whatever reason, have completely taken up the cause of the water companies.

origin, is really concerned with what is best for the London public. We find one water scheme recommended because it is the hobby of a particular party in the London County Council, and they cannot bear that the other party should beat them. The same scheme is opposed by other persons because it would be against the interests of the water companies, for whom this or that person is really though not nominally acting. This is really the history of all that long paper and discussion at the Surveyors' Institution, recently reported in our columns. Mr. Middleton's paper was in many respects a very able one ; but Mr. Middleton was a witness for the water companies before the Royal Commission ; his paper all went to show that the present provision for water was sufficient for many years to come : "argal" (as the grave-digger in "Hamlet" says) if that is so, why disturb the water companies? That was not said, but that was what was meant. Otherwise, how are we to explain the presence at the meeting of two eminent legal counsel, both of whom have been employed for the water companies, and their obvious mission to scoff at any speaker who opposed the *status quo*? Eminent barristers are not professionally interested in water engineering, nor are they, we believe, in the habit of attending meetings on subjects in which they are not interested unless there is some special reason for their attendance ; and it would be interesting to know on whose behalf and on what grounds these eminent legal luminaries attended at the Surveyors' Institution. It was not in the interests of the London public at all events, nor were those interests fairly represented in the discussion on that occasion.

One of the results of the fact that water has been so long supplied to London by trading companies is that the whole class of water engineers, and those who are in any way connected with the subject of water supply, have got into the habit of regarding water not as a substance to be supplied as liberally as possible, but as something which is to be dealt out grudgingly, and in the use

of which the inhabitants of a city are to be taught and compelled to be as niggardly as possible. This was obvious over and over again in the discussion at the Surveyors' Institution. One engineer after another spoke as if the great object was to reduce the use of water to the lowest possible quantity. The more copious use of water for ablation, which is fortunately increasing every year, was actually spoken of as if it were not only a folly but a kind of moral aberration which was to be regretted and should be put down compulsorily; one engineer suggesting that with proper rules and regulations it would be possible again to reduce the measure of supply to the twenty-five gallons per head which he remembered as obtaining in happier and more enlightened days. Some part of this wrong-headed movement for curtailing the use of water is probably due to sheer ignorance. Some of the men who are efficient water engineers are men of otherwise little general education, and whose own habits of life do not enable them to form any idea of the extent per head to which water is used, and beneficially used, in the best class of houses. Waste of water,—i.e., the running away of water which has not been used at all, is always to be deprecated. But the copious use of water is not waste; on the contrary, it is one of the most important conditions of healthy life in large cities, and we are inclined to think that if even the superior class of engineers who lay down the law that thirty, or thirty-five gallons per head is an ample supply, were compelled to restrict themselves to the contents of a 30-gallon cistern filled in the morning, and to draw from that for everything for the day—including, it must be remembered, not only personal ablation, but cooking, washing up, and what may be included under the general term of "scavenging," they would find out before the close of the day that they were short of water, and would reconsider their statements.

The two points to be prominently kept in mind, then, in the future consideration of the question of London water supply are—first, that it is a question which no one has any right to consider except on the broad ground of public health and the public good, and that all importation into the question of merely political motives—the success of this or that party or this or that corporation, are not only from the purpose, but, in connexion with such a subject, are absolutely immoral. The second is, that a copious, and not a niggardly supply, is what is wanted for a great city; that the object should be not to see how little water you can give people, but how much. Whether, by means of impounding reservoirs, the supply of the Thames can be made to yield enough for the future supply of London, or whether it will be necessary to seek an auxiliary supply from a distant source, are questions of detail. We are inclined to think that the auxiliary supply will prove to be necessary. But whether it prove to be so or not, the general principle to be kept in mind is that the public good alone is to be considered, and that an ample supply is demanded, and will be more and more demanded with every decade. There is water enough in this country for all to have an ample supply; the only difficulty is to collect it at the places where it is wanted.

We have referred to the question of supply by meter; and without pronouncing

decisively in its favour, we think it is a point to be kept in mind. What is the precise reason of the violent opposition to it on the part of the water companies and their supporters we do not exactly understand; but as there is that opposition, we may take it for granted that in some way they regard it as disadvantageous to themselves and favourable to the consumers. The most absurd reasons were adduced against it at the Surveyors' Institution meeting; among other things, that it would be impossible to furnish the number of meters necessary, those who used this argument apparently forgetting that there is a gas meter in every house in London: why is it any more impossible to furnish a water meter? The really valid objection to meter supply is that the poorest class, if charged by the amount they used, would endeavour to dispense with the use of water altogether. This, however, might be met by placing houses below a certain low standard of rental on a rate. The advantage of a meter supply would be that the onus of keeping his apparatus watertight and in proper order would then be thrown on the householder, who would certainly not fail to see to his fittings in that case; and the whole expense, trouble, and irritation inseparable from official inspection, whether by a government or a trading company, would be done away with. There may be reasons of greater urgency on the other side, but we have not heard them yet. The question is, at all events, one which should be kept open for due consideration in connexion with the future of London water supply.

SILVER AT THE BURLINGTON CLUB.



THE loan exhibition of silversmith's work now on view to members and their friends at the Burlington Fine Arts Club, is not only one of quite exceptional richness and beauty, but it has a special interest in regard to the fine character of the English works exhibited. Some of the Flemish and Spanish objects exhibited are more sumptuous in style, but for refined beauty of design there is nothing superior to the best English work exhibited. The cup and cover gilt, No. 1 in case C, a piece of early seventeenth-century English work, has such a classic refinement of detail that at first glance it suggests rather work of the best period of the Italian Renaissance. The bowl in this instance is in the form of an ostrich egg. To the moulding on the cover are hinged what the catalogue justly calls "three exquisitely designed vertical straps in the form of caryatide figures," which secure the egg. No. 3 in the same case, of slightly earlier date, has the same refined Italian character. The works in this case are all English, and though some of them are of small size and comparatively simple in design, they are more truly artistic in feeling, and especially in refinement of outline, than many of the larger and richer works in other cases. We may also notice in Case D (also all English work) the cup and cover numbered 19, a melon shell mounted as a sea-monster, supported by dolphins on a circular base.

It would be impossible to describe the collection in detail; the task would be endless. It would be more to the purpose here to consider some of the various ways

of treating silver which are illustrated in different classes of articles exhibited. We find some articles in which the object is to take the eye captive by a universal richness of treatment, leaving no portion of the surface untouched. A typical example of this is the large German cast and embossed cup, No. 1 in case F, long believed to be a work of Cellini's, but now recognised as of Augsburg make. We confess we are surprised at the belief that it was Cellini's; it has not the Italian character, and it has what is so often the characteristic of German work, richness of surface without refinement of line. The English cup in the same case (No. 3), sufficiently of the same character and size to be called a companion piece, though less sumptuous than the German example, is better in outline and so far more artistic. It is in form that both English and Italian pieces assert their superiority to German. No pedigree is given of the massive silver table from Wentworth Castle, shown in case G, but we should be surprised if it is not Italian; the bold and yet finished and graceful form of the supports is in the highest style. There is something similar in character in the two gueridons (tall circular pedestals) in Case K at the opposite end of the room, lent by her late Majesty; there is here the same richness of decoration without losing sight of clearness and precision of form in the supporting parts, especially in the finely-designed scroll feet (why these are called "marine-looking" in the catalogue is not apparent). There is, however, no statement of place or date attached to these either. It would be interesting to know their artistic history.

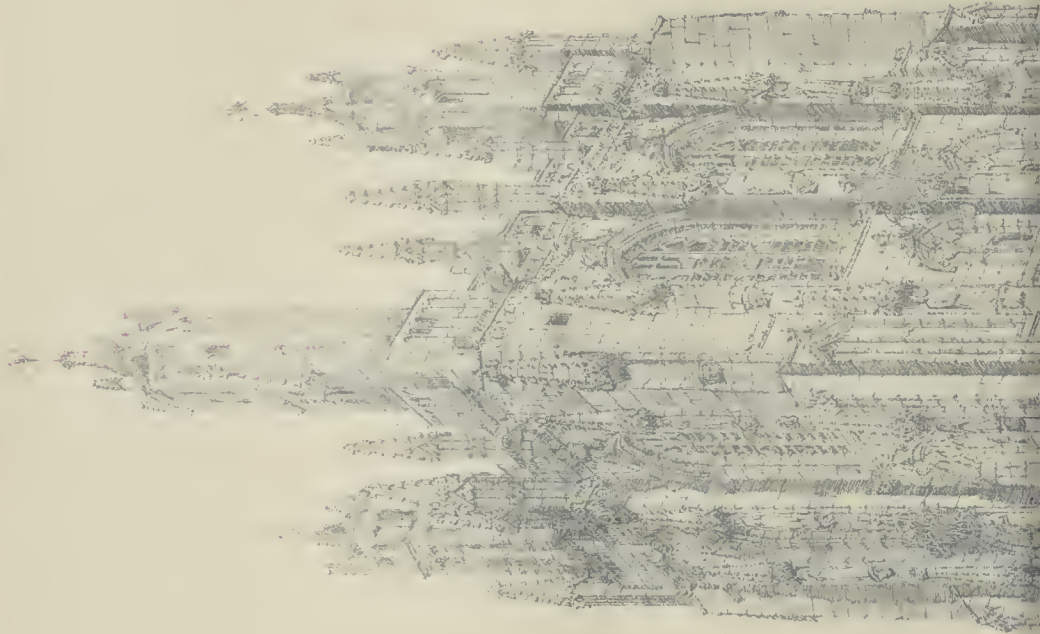
Most of the fine and large cups and tazzas in Case I are English, one of the finest of all being one of the smaller objects, viz., Mr. Kennedy's two-handled gilt porringer and cover, standing on ball feet with a removable outer casing of silver, pierced and embossed with a design of foliage intertwined with children and birds; a perfectly beautiful work, of the date 1670. Among the various other articles in this case we may contrast with the last-named very rich piece of work the two large plain flagons, Nos. 67 and 72, the body carefully modelled with a pronounced entasis; there is little ornament, the whole effect is obtained by the large and ample modelling and curvatures of the main lines; but these are in their way two of the finest pieces of work in the case, and should be studied for the effect to be obtained by mere line apart from elaborate surface ornament. In the large cup lent by St. John's College, Cambridge, it is worth notice, as a point in design, that the ornament is too flat to have any effect in comparison with the large scale of the cup, and looks weak in consequence.

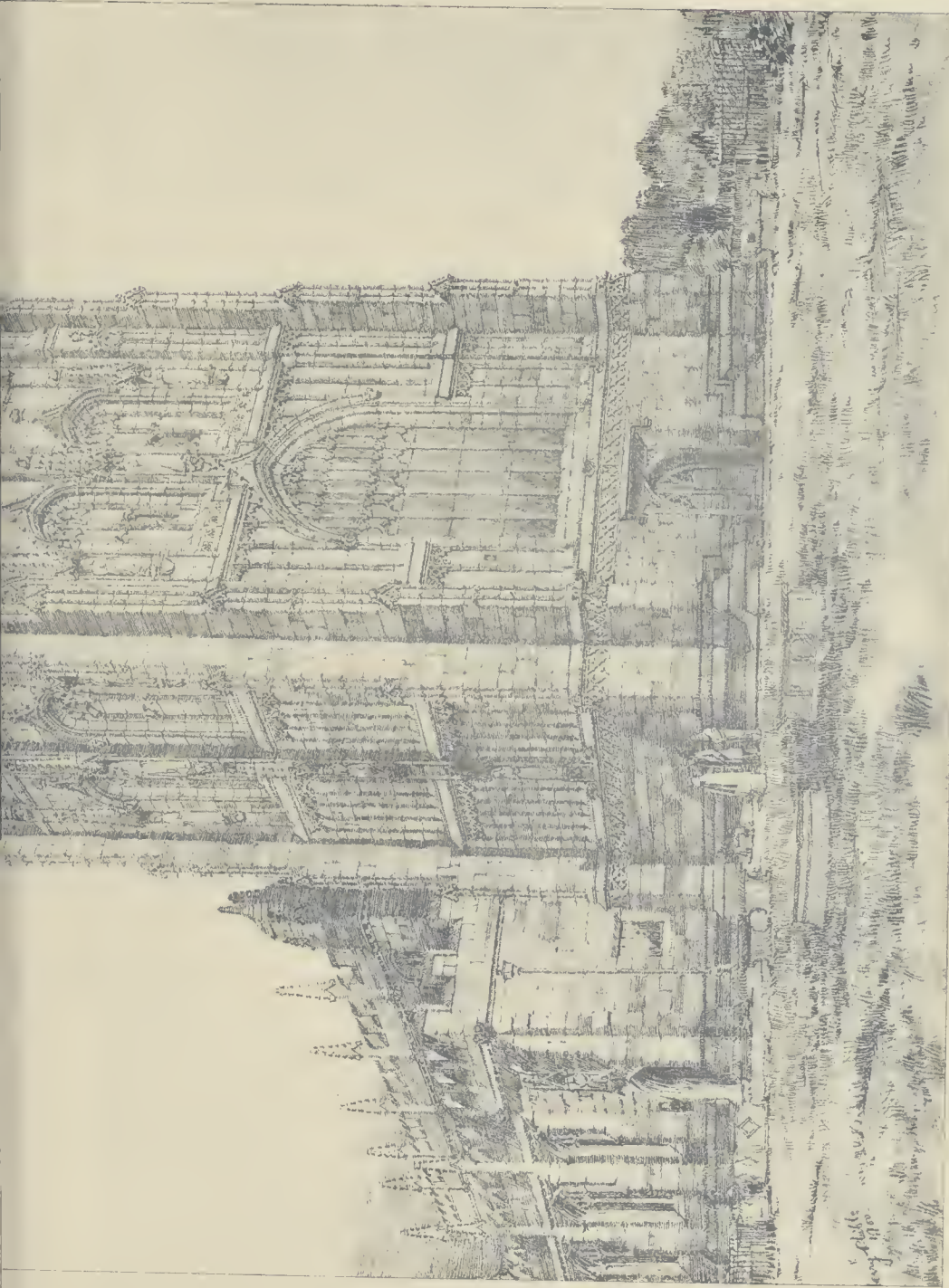
In Case J we come on a different school, mostly Flemish, German, and Spanish work, and the first two objects in the numbering, a Flemish chalice and a Spanish ewer, are both typical examples of the sumptuous character of decoration of this school; for just as with point lace, so it is with silversmith's work, there is a very strong similarity between Spanish and Flemish work. Among the objects in this cabinet three German cups (No. 4) are noticeable for a marked speciality of character and design; they have three bands of engraved ornament, one over the other, with very good effect, and are exceed-



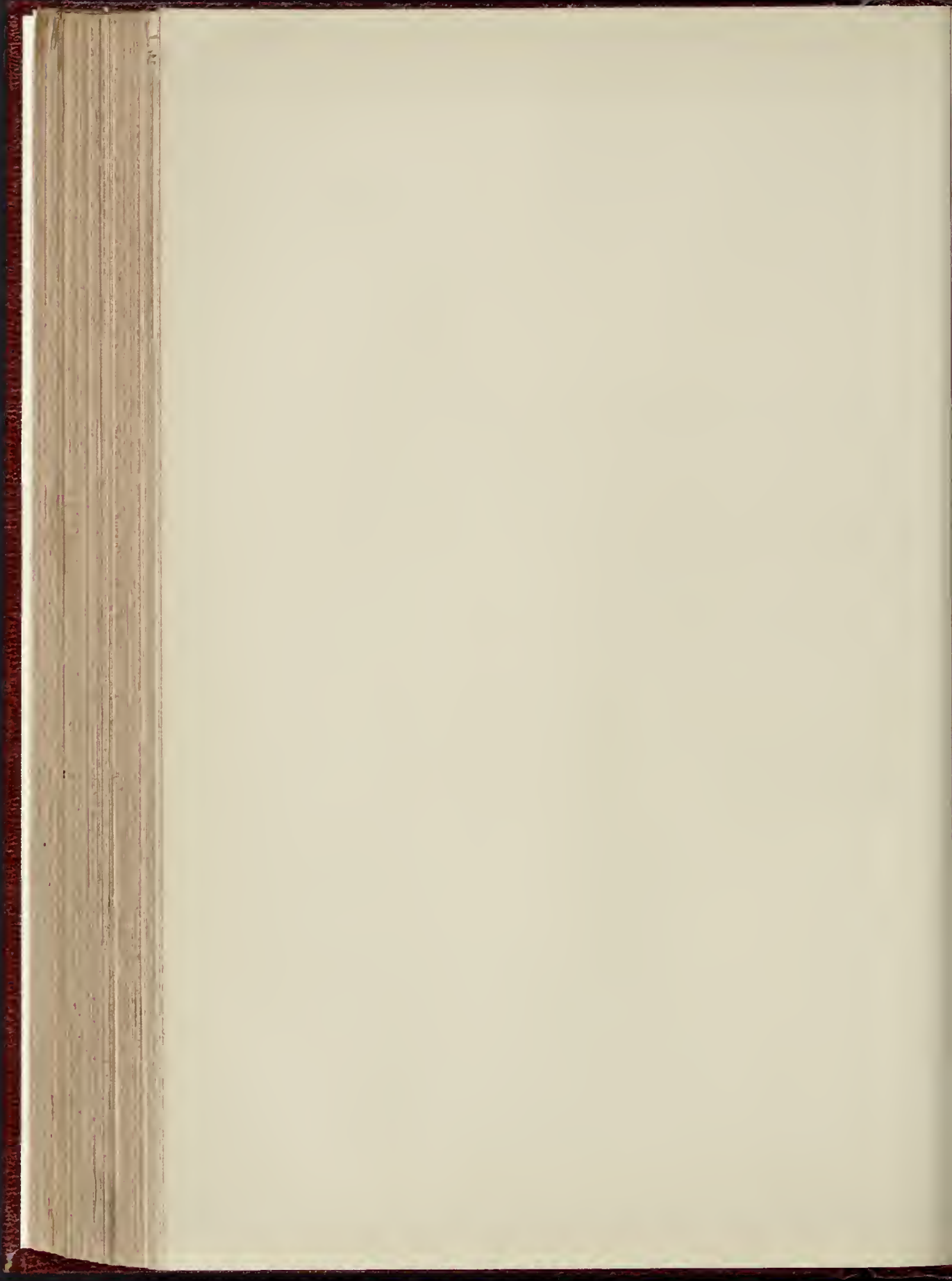
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THE BUILDER, MARCH 9, 1901





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enterprise that has not yet been equalled in the world's history, and at the threshold of a new century era, to open the door to unknown possibilities.

Perhaps it will be well to mention here that there is now a feeling—almost universal—that these International Exhibitions are being held too frequently, and one feels quite gorged with them. It would be better to have them forty or fifty years apart, in the same territory, those in the interval being held by the rival nations.

Having fixed the date so early as 1892, we see it took six years to progress to fruition. The services, staff, &c., were settled in 1893, the site fixed in 1894, and the regulations and rules promulgated in 1896, leaving four clear years, in which were to be brought forth the designs (in competition or otherwise) and the erection of the buildings themselves.

It was left to M. Alfred Picard, Inspector General of roads and bridges, the official reporter of the 1889 show, to draft the preliminary ideas of the 1900 Exhibition. On the general lines laid down by him (which included for the first time the right bank of the river), a competition for the supply of ideas was initiated in which 108 competitors entered. Parliament voted a credit of 100,000 francs for the purpose. The competitors were at liberty, by the conditions, to raze everything within the selected boundaries, except the Palace of the Trocadero and the Eiffel Tower. The majority of the competitors favoured the opening up of a new avenue from the Champs Elysées to the Invalides, which would entail the destruction of the Palais de l'Industrie, a relic of the 1855 Exhibition. Round this scheme raged a hot and angry discussion, but eventually it was decided to adopt it, and the avenue (now known as the Avenue Nicholas II.) was almost an accomplished fact. Singularly enough, towards the close of the eighteenth century, the same thing had been talked of by Gabriel, the well-known French architect of that time, when he proposed to shave off the top of the rising ground where now stands the Arc de Triomphe, and to make various extensive improvements in this quarter of Paris. The murmurs of the approaching Revolution postponed its accomplishment until our own day.

Then came the second competition, in 1896, for the arrangement of the Exhibition buildings. M. Picard having decided on the knotty problem of how to provide, on almost the same site, as regards size, as the 1889 show, about triple the area for the 1900 one. The idea being already adopted of an avenue terminating in the Invalides, with a palace on each side of it, next the Champs Elysées, the jury selected nine schemes for the large palace and eight for the small. A final ballot brought out the name of M. Girault as architect for the Petit Palais, while for the Grand Palais were selected (1) M. Louvet, (2) M. Deglane and Binet, and (3) M. Thomas. Eventually most of these were associated together in the design and construction of the Grand Palais (except M. Binet, who received as consolation the commission to erect a monumental gateway at the principal entrance of the Exhibition). The architects who were placed second in the competition for the Petit Palais were commissioned to execute the architectural decorations of the new bridge, forming the connecting link between the Champs Elysées and the Invalides. MM. Cassien Bernard and Cousin, the architects referred to, were to work hand-in-hand with the engineers already appointed, MM. Resal and Alby.

Staff.—A word as to the staff—the architectural department which worked under the direction of M. Picard. This was housed in a fine red brick building or pavilion, and offices on the Avenue la Bourdonnais. Very complete plans, &c., can be seen in Vols. 13 and 14 of "La Construction Moderne," copies of which can be seen in the Royal Institution of British Architects' library. The building is not of sufficient importance to deserve detailed notice here.

Finance.—Perhaps a word or two on the financial aspect of a great Exhibition may not be without value. In 1867 the State and town furnished a subvention of 12 million francs and a Guarantee Corporation had 6 millions more in hand, but was not called on to pay, there being a balance on the right side.

In 1878 the State, jointly with the town, executed the operation, and there was a deficit of 20 millions, but of this sum 10 millions went to pay for the Trocadero Palace.

But that of 1889 resulted quite otherwise,

and the surplus of receipts over expenditure reached the respectable total of 8 million francs.

The 1900 Exhibition, of which the official accounts have been already published, results in a deficiency of over 2 million francs, but this applies to the official work only. There are in addition the unofficial shows also to consider, (670 projects were submitted in the preliminary competition, sixty of them retained for the final selection) which had to pay extortionate rents for their ground space, and were moreover over-capitalised, many of them closing their doors early in the summer. The total amount of capital raised for these unofficial shows was 4½ million francs, nearly 2,000,000. The immense Globe Celeste was the most unfortunate, on account of the disaster to the bridge which fell when the centering was being struck. The show was at once closed by the authorities, and only reopened when the summer was nearly over. "Paris in 1400," was another speculation which ended in ruin early in August, and was for sale then at the break-up price of 2,000 francs. Several of the others were practically bankrupt before they were ready to open their doors to the public, their shares in the market being so much waste paper. An example may interest you: one restaurant, the capital at starting being 10,000, was re-sold, in three months, for 4,000, and one month later to a new proprietor for 1,600. Of the others, such as the moving platform, the great wheel, the Marécorama, and the Palace of Optics, the capital depreciated very greatly, in some cases 90 per cent. So we see much money was sunk by the concessionaires, and nothing was reaped from it.

Also in the case of the Exhibition bonds, the only means of raising money to float the Exhibition at all. Over three million pounds was easily raised by the French bankers by means of 11. bonds, which were greedily snapped up by the public; but they were practically given away, for each bond carried the right of twenty one-franc tickets for admission, a reduction of 25 per cent. on certain side shows, and participation in the drawings of the lotteries, the latter being the only prospect of remuneration on the outlay. But I must weary you no longer with details of this sort.

Works and Construction.—The wreckers (those wolves of the architects, as they have been called) and the navvies were looked after by a Committee of Hygiene. All the immense masses of earth that were moved, whether in foundations, road or tramway cuttings, were profusely sprinkled every day, when work ceased, with pulverised sulphate of iron 100 parts to quicklime 200 parts to every square metre. This precaution to us may seem absurd, but it must not be forgotten that Paris is a very insanitary city, and still abounds everywhere with hidden cesspools and middens. A strong staff of inspectors were told off for this special service of sanitation.

Demolitions.—I have no data of the cost of demolishing the structures that formerly stood on the site of the late Exhibition, but I may mention that the old Palais de l'Industrie was removed for the sum of 200,000 fr., only the colossal group that crowned the structure, by Elias Robert, being preserved. The dome, the "Dome Centrale," on the Champ de Mars site, cost 20,000 fr. to pull down; and the Pavilion of the Town of Paris—from the last Exhibition—20,000 fr. Besides these, there were razed the Palaces of the Fine and Liberal Arts, but I have no items of cost. It is estimated that it would cost, to remove the Galerie des Machines, 1,000,000 fr. if decided on.

Workyards.—The contractors' yards for heavy material were laid out in a most methodical manner, amply provided with tramways and railways, cranes and hoists, and everything desirable to facilitate despatch: and despatch was the order of the day. The daily labour roll amounted to over 5,000 hands, in spite of the fact that everything that could be fitted together before arrival on the site was so done.

There were twenty-three of these workyards, each under an architect, in some cases under two architects.

Stone.—That most largely used was the calcaire grossier, a white freestone largely found in the Paris basin: from the quarries of Châteaufort, near Nemours (Seine et Marne), as was used for the Arc de Triomphe; also the stone from the Aisne and Oise Valleys, as the new Louvre: those of Charentenay and Courson (Yonne) as we see in the Hôtel de Ville. The ashlar work of the Petit Palais was

a hard freestone from Coutarnoux (Yonne) up to the first band, and above that a freestone from Méry. In the Grand Palais, where there were about 40,000 tons (French)—17,000 cubic metres—used, the lower part was from Villebois, and was the only example I could trace of a quarry-worked stone. All the rest was cut and worked on the site, the freestone being from Euville, Lerouville (Meuse), and Larrys (Bourgogne) for the *socle*, and from Villers-Adam and Vic-sur-Aisne.

We also see pink mottled limestone from the Côte d'Or, or Burgundy, employed in decoration and pilasters, similar in appearance to our Devon limestones. Also grey granites from Calvados, white and golden yellow freestones from Poitevin sources, and the valley of the Oise.

Stucco.—But the material most profusely used throughout the Exhibition for the temporary buildings was the stucco or "staff" applied over the light wood or iron skeleton of the structures on fireproof lathing or wirework. As most of the buildings were temporary, they were executed almost wholly in this way. This "stuc" (the use of which we can readily trace back to the days of the Romans) was very largely used in the seventeenth and eighteenth centuries, and is now the universal material used by speculating builders in Paris, for the vestibules, staircases, entrees, &c., and an old example can be seen by the curious in the Presidency of the Chamber of Deputies, where the stuc was coloured; the work was by Jules de Joly, then architect of the Palais Bourbon.

Ciment Armé.—Then there was the ciment armé, or concrete with steel cores, used in large masses, profusely used in nearly all the buildings, whether permanent or temporary, especially for staircases and landings, and galleries of wide span. I shall touch on this later when dealing with the Petit Palais.

Steel.—But looking back over the century just passed, the material that has come most to the front is steel. At the opening of the nineteenth century iron or steel construction was unknown except in the form of cast girders and occasional roof trusses, either wholly or partly in iron. But the succeeding years bring us by rapid strides, through the demand for high and wide buildings, and the commercial use of the steel process, past such landmarks as the Crystal Palace of 1851, and the Gare St. Lazare, in 1867 the elliptical exhibition building, in 1878 the machinery gallery, trusses without tie rods, of 110 metres span, by the eminent engineer De Dion, outvying our own St. Pancras station, in 1889 the Eiffel Tower, 300 metres high, and the far famed Forth Bridge. In 1900 steel had become almost the universal material for the frame of structures, even if temporary. But specially to be noticed is that magnificent bridge, the Pont Alexandre III., the metal work of which cost over two and three-quarter million francs. Over 50,000 tons of steel were used in the two Fine Art Palaces alone.

An example from the statistics will show the great economy effected as the result of previous experience, gained in the former exhibitions. In 1878 it cost nearly 5 fr. per cubic metre to erect the steelwork coverings; in 1889 this was reduced to 2.77 fr., while in the recent Exhibition I am assured the figure barely reached 2 fr. per metre cube.

Foundations in Bad Ground.—A singular process was employed in the marshy part of the Exhibition site, where the ground was soft and spongy—that was, mechanical compression, in which a steam pile-driver was first used to perforate the ground down to a hard bottom, then to enlarge the bottom of the hole thus formed, and finally to beat down and consolidate the concrete thrown in to form the foundation, a large concrete pile standing on a kind of mushroomed foot on the hard bottom. This avoided the necessity of removing large masses of poor soil, and gave at the same time a stable substructure for the subsequent erections.

Estimates.—A word on the system of estimates prepared by the architects for the builders. Instead of pricing a bill of quantities, as with us, and the job going to the lowest tenderer, the architect, or his surveyor, gives in his estimate at a given figure. Invitations are then sent out to the contractors, and the game then is to find out who will give the greatest rebate below the already quoted price.

Design.—As regards the buildings collec-

* "Staff" is a variety of fibrous plaster, cast in moulds.

tively, one must regard this Exhibition as a spectacular achievement, an architectural fairyland; and one can overlook the faults of too exuberant, or fantastic detail, and similar things, bearing in mind that these productions were for a festal occasion, and festive they undoubtedly were, great was the variety of form and mass, extraordinary originality and vitality were displayed in the detail and decorations, while most vigorous was their execution. Picturesqueness was supplied by a row of foreign pavilions on the river bank, the Château d'Eau the gardens of the Trocadero, and other parts of the Exhibition, while dignity was worshipped in the symmetry displayed in the vistas of the Champ de Mars and the Esplanade des Invalides. All this combination was entirely due to the genius of the French artists and their unique methods of training.

Plan, &c.—With the aid of a plan, or rather a map, of that portion of Paris lying on either bank of the Seine from the Pont de la Concorde down to the Pont d'Iéna, and even a little beyond, we find that the Exhibition was laid out on four main sites, two on each bank of the river, with connecting strips bordering immediately on the river itself; but these four sites fall into two groups, each of which consists of a piece of ground on one side of the river connected with another similar plot on the other by means of a bridge, which forms the axis of each group. Thus we have the Champ de Mars—the largest of these four plots—connected with its opposite neighbour, the Trocadero gardens, by the Pont d'Iéna. Similarly we have the Esplanade des Invalides joined to the Champs Elysées portion by the magnificent Pont Alexandre III. Then these two groups are connected themselves by narrow enclosures or strips of ground on the banks of the Seine, as the Rue des Nations on the left bank (the Quai d'Orsay) and the Rue de Paris and Old Paris on the right bank. But the axes of these two groups are inclined to one another, almost meeting on the south side, and diverging to the north, on the large bend made by the river between the two bridges above named.

The area of the site covered is much more than in previous exhibitions, and amounts to 112 hectares, including the overflow site in the forest of Vincennes, allotted to the railway and heavy machinery exhibits.

Description of the Plan.—Champs Elysées Portion.—At the main entrance, overlooking the Place de la Concorde, we find the Porte Monumentale, the principal entrance (of forty-five in all) that gave access to the grounds. This was designed by M. Binet. We pass along a broad walk, parallel to the river, bordered by statues, sculptures, and horticultural exhibits, leading to the magnificent Avenue Nicholas II. and the new bridge, the Pont Alexandre III. and we then find on our right the two Palaces of the Fine Arts, the one nearest to us as we emerge on to the avenue being known as the Petit Palais (although itself an immense structure), and facing it on the other side of the avenue the Grand Palais, the rear of which abuts on to the Avenue d'Antin. These features, the two palaces and the bridge, are intended to be permanent embellishments of the town of Paris. Without staying to describe these fine buildings, we pass along the continuation of the broad walk above referred to, cross the Avenue d'Antin and the Pont des Invalides by a picturesque footbridge, of which you will have a view later, and enter a narrow enclosure between the Cours de la Reine and the river, known as the Rue de Paris, containing chiefly the large pavilion of the town of Paris, by M. Gravigny; the Palace of Horticulture, with its aquarium in the centre; and the Palace of Congress and Social Economy. Each of these structures borders on the river, and on the other side of the Rue de Paris is a miscellaneous crowd of small shows, quite Parisian, such as the Maison du Rire, le Grand Guignol (French Farce), the upside-down house, and so on. Then by another footbridge by the Pont de l'Alma into the picturesque portion known as Old Paris, also bordering on the river, past several bakery exhibits, and emerge on the large garden of the Trocadero, where are situated the French and foreign colonial exhibits, the eastern portion being allotted to the latter and the western to the French colonies and protectorates. The Palace of the Trocadero, remaining from the 1878 Exhibition, was not itself a part of the 1900 Exhibition, although included in the site (a portion of the basement

and cellars excepted), and at the northern extremity at the rear of the palace a large panorama of Madagascar. From the Palace of the Trocadero we get our first view over the crowd of buildings forming the Exhibition, looking south to the Champ de Mars, and the plan of the western portion of the site becomes apparent. Before us is the Pont d'Iéna, and opposite us is the Eiffel Tower; beyond it is the Champ de Mars, flanked on either side by a range of palaces, and at the end the vista is closed in by the Château d'Eau and the Palace of Electricity. At the rear of the last-named is the old Galerie des Machines, still standing, and now very much transformed. The terraces of the Champ de Mars, on which stood the Palaces of the Fine and Liberal Arts of the 1889 Exhibition, by M. Formigé, have been demolished.

The Champ de Mars is connected with the Esplanade des Invalides by the Rue des Nations, where we find the most picturesque spectacle of the Exhibition, the row of foreign pavilions abutting on the river, destined to be wiped out of existence by the time I am addressing you, although a few of them are to be re-erected in various parts of the world. On the same bank of the river, before entering the Street of Nations, we pass the Palaces of Forestry, Navigation, and that of the Land and Sea Forces.

Then coming to the Esplanade des Invalides, we find, as on the Champ de Mars, two parallel ranges of buildings, devoted entirely to the decorative and industrial arts, the avenue between these two rows being a continuation of the Avenue Nicholas II. and the Pont Alexandre III., and terminating southwards in the fine vista of the Hôpital des Invalides. It is in this portion of the Exhibition that we find the buildings designed on a high artistic level; the façades are very fine, the masses happily grouped, and the details, if somewhat exuberant, are extremely suitable.

In order to be able to circulate round these vast congeries of buildings, there were two routes, in opposite directions, the electric railway, and the *plateforme noblie* (which we shall meet again at the Glasgow Exhibition during the coming summer); then also there were the many lines of penny steamers, several lines of railways, and the ever-present "bath chair."

La Porte Monumentale, designed by M. Binet.—This is a difficult structure to describe without a plan and drawings, but the secret is easily seen and its construction grasped in a view here given, together with the drawings on the walls, the construction being of three large arches on a triangular plan, supporting a large gilded dome. It was well set back from the roadway, and was visible from all sides. An immense archway forms the main entrance, 65 ft. wide, flanked by decorative minarets, 160 ft. high. Behind were other two arches, the whole covering the numerous turnstiles giving access to the grounds, while at the rear was a large wrought-iron gateway, the "Porte des Echevins," reserved for official processions, these all supporting the immense decorated dome. The whole was covered with rich colour, frescoes, and glass mosaics, interspersed with innumerable tinted electric lamps, quite indescribable; while at night one saw charming colour effects produced by the luminous globes, and concealed lights of great power, throwing up the whole into brilliant and overpowering splendour. Its effect to the mind of an architect can only be described as "Arabesque," for its author, who has a passion for colour, was undoubtedly influenced by the art of the Far East.

The crowning feature of this composition was the piquant figure of Modern Paris in the attitude of welcoming the nations, represented by a lady in a rich evening dress and cloak. This figure was the work of M. Moreau-Vauthier, and was the cause of a lengthy and rather hot discussion. The Government decided to remove it, but it remained *in situ* throughout the period of the Exhibition. Then the Ship of State (also the arms of the City of Paris)—a motif in high relief—ornamented the front or spandril portion of the main arch, and at the base of the flanking masses was the original and powerful conception of M. Guillot, a fine bold frieze in bas-relief, the "Iris du travail," representing the contribution of Labour to the Exhibition.

An ingenious arrangement of the turnstiles must not be overlooked, calculated to accommodate the passage of over 60,000 persons per hour (see plan lent by the Royal Institute of

British Architects). A very careful and exact model was first made, and from this M. Binet produced his final studies.

The whole structure stands on a foundation of piles; the skeleton was a very light construction of iron, overlaid with a framework of wood, and covered with plastic or "staff," then enamelled or painted in colour. Its estimated cost was 20,000 l.

Recently this was advertised for sale, as old materials. There were 200 tons of iron, 250 cubic metres of wood, 1,000 of building stone, 150 of brick, 750 of other materials, and 7,500 pieces of glass and lamp globes. In a recent issue of a French professional journal I see the price it fetched was 408 l., about 10,200 fr.

Le Grand Palais des Beaux Arts.—This building, on the largest and most monumental scale, was, during the Exhibition, the home of the French and foreign displays of the fine arts, painting, sculpture, and architecture; but it will remain as the permanent home of the French annual Salon, and possibly will also be used as the locale of many Government fêtes and displays. The building is of immense size, covering nearly ten acres; its plan resembles the letter H. The commission for this was given to three architects, who worked together most cordially in its production, and so successfully treated the various portions as to make them appear one great building externally. The front portion, that facing on the Avenue Nicholas II., was entrusted to M. Deglane, who was responsible for the immense façade, and the great hall or "nave" forming the sculpture hall. M. Louvet executed the central portion, forming the link between the front and rear, with the grand staircase, "l'Escalier d'Honneur," for ceremonial use, leading to the concert rooms and picture galleries on the first floor. The rear portion was allotted to M. Albert Thomas, comprising the front facing the Avenue d'Antin, a large central hall, covered by an elliptic dome, and the wings.

The cost of this was estimated at 25,500,000 fr. The foundations, over 550,000 fr., were put in with great difficulty, as a portion of the site was a mere marsh, with beds of peat and clay; part of the palace is therefore constructed on oak piles, and part on concrete bedded on a sandy clay. The stonework, 40,000 French tons, in a brilliant white freestone, the calcaire grossier, was all cut on the site by a diamond saw, led by a ten ton traveller, running on rails. Stone was exclusively used on the external fronts, but the inner walls were of rubble and brick, faced with stone. Ciment armé, i.e., cement concrete strengthened with steel wire of large gauge, has been largely adopted for the staircases and galleries.

Then for the roof were used about 6,000 tons of steel, executed by Dayd & Pille, of Creil. I was informed the strains have been so carefully calculated that the resultants pass through the points of support, thus relieving entirely the masonry construction forming the enclosing screen walls of the palace.

Façade.—M. Deglane was obliged to alter and modify his first conception in order that the Petit Palais, facing it, should not be overpowered by its more important neighbour. Instead of one large entrance porch, as originally intended, of great height, we find now three wide bays with doorways and a colonnade; the basement was considerably lowered, and the roof put almost of sight. But the glory of the façade was retained in the glass mosaic frieze, about 250 ft. long, designed by M. Fournier.

The immense nave, or sculpture court, 200 by 55 metres, is under one great glass roof, the central part being dome shaped, of about 230 ft. diameter, carried on curved principals formed as box girders, grouped in pairs, and decoratively treated with wrought iron scrolls and ornaments.

Centre.—The intermediate part, by M. Louvet, or bridge of the H comprises a return of the nave, and the staircase of honour, with two short façades on the north and south sides respectively, each 65 metres long. M. Louvet had a knotty problem to settle when asked to provide for exhibitions of all sorts; the ground floor being intended for the Concours Hippiques, and equestrian performances; for sculpture and various art exhibitions; the first floor for picture galleries, and a salon d'honneur, and the basement for stables and stores, while his staircase of honour, besides being the principal means of access to the upper story, was to be the grand decorative feature of the interior. Moreover he had to

arrange this portion as a complete whole, with its own entrances, stairs, lift, and service, so that it could be used for functions quite apart from the Great Hall in the rear block. How he has managed this, only those who have seen and studied carefully the plan, can appreciate.

At the head of the wrought-iron staircase, sumptuously gilded, is the great concert-room, for 1,500 persons.

Rear.—M. Albert Thomas, who did the rear portion of the great palace, had a fine opportunity, and has produced a very fascinating work. It comprises a rectangle of 150 metres by 45 wide, covering nearly 7,000 square metres, with an important façade on the Avenue d'Antin, set well back from the frontage, and raised about 4½ metres above the roadway, giving a well-lighted basement to be utilised as stables during the horse competitions, with room for 600 horses, and accommodating also all the auxiliary services of this vast edifice, such as police, fire and ambulance posts, telephone service, office staff, tobacco bureau, &c.

A large hall, nearly circular, forms the central feature on the ground floor, being about 29 metres diameter and 34 metres high, top-lighted, and of great beauty and originality of design; a large gallery, 5.50 metres wide, running all round the outside, on two floors; and two rectangular halls in the two wings, 20 metres by 45 metres, two stories high, containing the means of access to the upper floors, and giving an uninterrupted vista from end to end of the building.

The front to the Avenue is treated with coupled columns, partly detached from the wall, with a central projecting portion forming the second main entrance to the palace, having in front a vast flight of steps. This portion is intended to be used for special exhibitions and functions, independently of the remainder of the palace.

A fine frieze in bas-relief, by M. Joseph Blanc, about 300 ft. long, represents the history of art, and is placed behind the colonnade above mentioned. It has been executed at Sèvres, in opaque pottery or ceramic, and gave a most remarkable effect, being obviously inspired by the Assyrian friezes of Darius.

The Petit Palais, by M. Girault.—This very fine building, to me the gem of the Exhibition, covers a surface of 7,000 square metres, or nearly 1½ acres. It is intended, like the grand palace, to be a permanent home for French art, a State museum in fact, and will become the property of the City of Paris, for which the Municipality gave twenty million francs. As part of the Exhibition it contained the retrospective exhibit of French art, such as ivory, bronze, and ceramic work, furniture, jewellery, glass, &c., from the earliest times to the most recent. In construction it should be noted that in this building steel was used to only a limited extent. The walls were all of rubble faced with ashlar, the vaults and floors of brickwork set in gypsum, and the roofs, with a little steel, covered all. I was very much interested, in 1899, when I had the privilege several times of visiting all the works in progress, of seeing how these particular vaults in the Petit Palais were constructed. They were of brick, set in plaster, i.e., the plaster of Paris, which is the universal cementing material, without any centering, only a small curved template being used as a guide; the men worked very rapidly (as plaster sets quickly) in laying the rings or courses of the domes or vaults till the shell was complete; this formed a centre for the next, and even a third, if required, shell on top of this. The cost of this style of work, very light and very strong, was 40 fr. per square metre; it was very quickly built, and exerted practically no thrust on the walls. The internal stucco decoration was then laid over the surface of the vault as required.

Several developments of the ciment armé were worked out by M. Girault. One corner of the palace was built entirely in cement concrete, with a criss-cross of iron rails bedded in the concrete (38 kilo. the metre, spaced 0.80 cent.)—whereas, the adjoining walls were on piles in the ordinary way.

Then his floors were largely in ciment armé, details of which can be seen in "La Construction Moderne."

In plan this palace was D-shaped, the interior being a garden surrounded by a semicircular colonnade, round which was grouped a double range of galleries in a semi-hexagonal form for the exhibits; the straight part of the D formed the façade, the main entrance being

in the centre, leading into a fine domed hall off which were two lateral galleries at a slightly higher level, and at the ends or corners, two saloons, from which one enters upon the galleries at rear. Several modifications were made in the design in M. Girault's final drawings, and even during the progress of the works, in order to harmonise with the great palace opposite. The lateral façades were made more ornamental.

In front the chief feature is a semicircular porch, approached by a fine expansive flight of steps, and at the head of this a "gate of honour," with beautifully designed iron gates, gilded. The order employed in the façade is an Ionic one, with lofty bays in the intercolumniations, the shafts being free from the wall, while in the end pavilions the columns repeat the order but are "engaged." Sculpture is used in abundance, the central porch giving us some very fine "motifs."

Internally the decoration is as surprising as the scheme of the exterior, the vaults and domes being covered with relief ornament and sculpture, very fine in treatment and used unsparingly. The columns and pilasters are of a bright and cheerful pink tone.

The loggia surrounding the garden I have already mentioned, but the charm of this portion of the composition cannot be described. One sought this corner gratefully, away from the crowd, with intense relief, and one could study at leisure the work of the master hand who carried off the prize so easily from all his competitors. I refer to the architect M. Girault.

From the further side of the loggia we look back at the inner side of the central pavilion, with the dome and gilded lantern rising above, and the pediment with its gilt bronze figures; the spandrels of the large arch had two fine nude figures in bas-relief.

The Pont Alexandre III.—Time presses, and I must go on with the description of the Pont Alexandre. This, though a purely engineering work, claims our close attention, for were not two of the leading Parisian architects employed to co-operate with the engineers? As M. Lucas so admirably put it when reading his paper before the Royal Institute of British Architects:—"This Pont Alexandre III. will remain an irrefutable witness to the necessity of the alliance between architects and engineers in works of public utility. More than to any structure of our time can we justly apply to it the motto of the Institute—*Usui civium, decori urbium.*"

Can we point to any such example in England, or even in the world? And what is the result? The finest bridge, considered from either the constructive or decorative aspect, that has yet been seen, retaining its monumental character and bearing a great dignity in spite of its festal decorations. The names of its authors I have already given, but will here repeat them, for they are not to be forgotten—MM. Resal and Alby, the engineers, and MM. Cassien-Bernard and Cousin, their architectural collaborators.

The bridge is constructed entirely of steel, 350 ft. in span, in one low sweep, the rise being 6½ metres, composed of fifteen girders (representing the width of the bridge, which is of the noble dimension of 40 metres), each girder being in two pieces, hinged, or articulated at each abutment and in the centre to allow of the necessary spring (see small print). The roadway had to be kept level, or nearly so, with the approaches, in order that the vista of the Invalides should not be interfered with when seen from the opposite bank. The cost of the metal work used in this bridge was about 2½ million francs, and the accepted tender for the foundations amounted to over 1½ million more, 12 per cent. below the engineers' price. The contractors were MM. Lefellier and Boutriquin, who had already done the foundations of the Pont Mirabeau (one of the newest bridges in Paris), under the same engineers.

The chief decorative features are the pylons, the statues, the lamp standards, the parapets, and the cartouches. The pylons or monumental piers, 17 metres high, are two at each end of the bridge, with figures representing—

N. side.—France of the middle ages, by M. Lenoir;
France of to-day, by M. Michel.
S. side.—France of the Renaissance, by M. Coustan;
France of Louis XIV., by M. Marquesta.

On each pylon is a gilt group of Fame and Pegasus, each by a different artist, and designed with great freedom and vigour. Then there are the lion groups on each approach, which can be seen in the views.

The strain on the abutments is about 50 kilogrammes per square centimetre. It took over 7,000 tons of steel, all from the Creusot works (of Long Tom fame), laid from a lattice-framed gangway or temporary bridge, first erected to facilitate the placing the girders in position, and then removed. The abutments are in granite blocks from the Vosges, the only material, perhaps, that would stand the immense strain. The setting out was so carefully done, that on joining up in the centre the discrepancy amounted to $\frac{1}{10}$ of a millimetre on a total length of over 350 ft.

The foundations had to be carried down to a depth of 54 ft. on the right bank, and nearly 60 ft. on the other. Caissons were sunk in the proper positions, and afterwards filled with concrete and granite. Needless to say, compressed air was employed in the subfluvial excavations. Some very massive castings bedded in the abutments receive the ends of the fifteen steel girders, a pin, circular in section, separating the ends of the girders from the cup in the casting to allow of the necessary movement. Each outer girder weighed 107 tons, and the others 144 tons. The platform carrying the roadway is supported by vertical members, connected to the longitudinal girders and then floored over with steel plates riveted down to the substructure, and extending over the quays, as well, where a system of masonry arches takes the place of the steel framing of the bridge.

While we have the word bridge in our minds, I may here mention for a casual glance the other bridges of the Exhibition, though they are all merely temporary, and of no importance compared with the magnificent Pont Alexandre III. The one connecting the Palace of the Land and Sea Forces with the Quai de Billy was a light and graceful iron footbridge, or "passerelle," partly in lattice and partly in plate girder work. The footway was suspended from an arch in lattice work springing from masonry piers on each side of the river, the span being 80 metres between the piers, and the width 8 metres.

The Pont d'Iena, one of the existing bridges of Paris, was absorbed in the Exhibition site, and effectively disguised by being widened, the footpaths on each side being thrown out over the river on girders supported on cantilevers secured to the masonry piers of the bridge. All this extension work is to be removed, and the bridge restored to its former state.

Two other temporary bridges were built across the river for pedestrians, one close to the Pont de l'Alma, and one to the Pont des Invalides, both on piles, and constructed of timber.

Then, too, we must not overlook the numerous and picturesque footbridges of timber over streets and ways in the Exhibition itself, and which were most artistically treated in what we should call rustic woodwork, with domes in trellis work over, as we see in this view, with a profusion of decorative barndoor fowls symbolising France.

The Palace of Horticulture comes next in order along this bank, designed by M. Charles Gautier. It was constructed wholly of iron and glass, with lateral galleries separated by a central nave, and a rotunda at each end. The framework was of extremely light iron angle-bars; and trellis-work in wood, often in very ornamental forms and groupings, was freely used to conceal the ironwork. The dimensions of this palace were 270 ft. long, 100 ft. wide, and 67 ft. high.

It is proposed to hand over these buildings to the City, to be re-erected, in all probability, at Passy, or to be retained in their present position, if the municipal authorities so choose.

Pavilion of the Town of Paris.—Then we arrive at the dignified pavilion, which the municipality had commissioned the architect, M. Gravigny, to erect—a large and handsome structure, covering more than 5,000 square metres, constructed entirely of timber, for easy removal. It contained a very important class of exhibits, embracing the various classes of public works undertaken by the municipality, with curiosities and other things of historical interest and value concerning the City. It was planned with a large central court, surrounded with galleries on the first floor, with central

stairs for access to the galleries as the principal feature at each end internally.

Palace of Social Economy, &c.—Passing along, we come to the Palace of Social Economy, or the Palais des Congrès, by M. Mewes. It is about 330 ft. long and 100 ft. wide, and its execution was carried out in a peculiar manner, eight of the best known co-operative industrial associations combining to do the work. It is entirely of timber, covered with "staff," and no steel was used because there happened to be no trade union representing the metal trades. The treatment of the river façade was very broad and simple, standing on piles, and encroaching on the river bed. The bays were divided by broad shallow pilasters. It contained, besides galleries for exhibits, ample and lofty rooms for meetings and congresses of all sorts, and was largely used for such during the whole course of the Exhibition.

Old Paris.—Passing down stream, we come to old Paris, on the same bank, lending itself to the picturesqueness that would otherwise be wanting on that bank of the river. It extended over 750 ft. along the right bank, built almost entirely on piles, and in the hands of M. Robida, who was responsible for its restoration, has given us a delightful conception of a medieval town. M. Robida was assisted by seven other architects. I will not stop to describe in detail the various buildings there represented, the towers, churches, gateways, and streets, but will refer you to the pictures and other illustrations on the walls. Suffice it to say there were two main "quarters," that of the Middle Ages and that of the Renaissance. The principal buildings in the Gothic quarter were the Porte St. Michel, the Tour du Louvre, the Rue des Vieilles-Ecoles, the Rue des Remparts, the Church of St. Julien-des-Ménestriers, and the Pillory of St. Germain-des-Près.

In the more modern quarter we found the Châtelet, a fragment of the Palais de la Cité (its celebrated Grand Salle), the external staircase of Sainte Chapelle, the Tour de l'Archevêché, and la foire St. Laurent.

The Champ de Mars.—The plan gives quite clearly the position and extent of the palaces, with their grouping, and we shall glance at the buildings as we pass along the left side round to the right. For these buildings, the four on the flanks and the one at the end, the bill for the iron and steel construction, which was of the most economical materials, came to the little total of 6,000,000 fr.

The terraces, on which stood the Palaces of the Fine and Liberal Arts, by M. Formigé, from the time of the 1889 Exhibition, have been removed, and the inclined plane formed leading up to the Palace of Water and Fire. On our left is the Mining and Metallurgy Palace, by M. Varcollier; next it that of the Textiles, entrusted to M. Blavette; these are balanced by the Civil Engineering and Education Palaces, the former by M. Hermant and the latter by M. Sortais. At the end is the Palace of Mechanical Science, with the grand set piece the Château d'Eau, by M. Paulin, and behind it, only visible as regards its roof, is the Palace of Electricity, which takes the place of the central dome of the 1889 Exhibition.

The area of the Champ de Mars thus covered is more than sixty acres, and one can hardly realise the vast extent of the buildings and grounds until the dimensions are given in detail, as you will hear presently. At one time the Commission entertained the tempting idea of covering the whole of this space with one large roof, to mark the progress of steel construction, but funds and time did not allow of this scheme being thrashed out. Perhaps we shall even have this monstrosity in the Exhibition of 1911, when the next international display falls due, and probably lighter and stiffer metals will then be in common use. Indeed, we hardly know where the triumphs of electricity are leading us.

The Palace of Mines and Metallurgy. By M. Varcollier, architect.—This is a well-designed building, facing on the central avenue for an extent of 315 ft., and on the return front, parallel to the river, of 250 ft. At the angle where the two fronts join is the entrance, surmounted by a lofty dome, flanked by pavilions, containing each a circular staircase for access to the broad open gallery or loggia on the first floor. The steel framework is covered with wood, over which is the usual wire lathing and plaster painted in a happy scheme of polychrome decoration.

The entrance portion is very striking—striking in more than one sense—for over the

porch is a little carillon tower containing a fine peal of bells, which gave much entertainment to the crowds that assembled to hear the performances.

The interior was a vast place, of light iron-work, and the exhibits were so treated to lend themselves to the decoration of the avenues. It was a great surprise to see how such an intractable material, in the hands of the manufacturers, could be made to follow the most pleasing lines and groupings at will, affording a glimpse of the time when swords shall be beaten into ploughshares, for here were firearms and weapons of offence undergoing all sorts of contortions to present a decorative display.

The Palace of Textiles, the shortened form of the official name, the Palace of Yarns, Cottons, and Vestments, was still larger than the last, being 923 ft. long by 424 ft. wide—by no means a small building. It was undertaken by M. Blavette. It had similar conditions imposed on it as the others of this group, e.g., a broad open arcade on the avenue front, the first story being about 23 ft. from the ground.

The large entrance porch was very dignified, and treated, as were nearly all the buildings on the Champ de Mars, with a polychrome scheme in very good taste. The effect at night, too, was very happy. It should be said that this entrance, as well as the one opposite to it, was used to accommodate traffic in the evenings, when the galleries and exhibits were closed to the public.

From the drawings you will gather much more information than I can stay to give.

This view shows the angle pavilion, where the frontage line sets forward, and illustrates the external staircase for access to the loggia on the first floor.

At the end of the Champ de Mars we have the two palaces, or rather one palace in two halves, devoted to Mechanical Science and to Chemical Industries, with the masterpiece of M. Paulin in between, the Château d'Eau, closing the vista at the southern end. These two palaces I am now describing are connected at the rear of the grand cascade by a broad corridor at the first-floor level (you must not forget the inclined plane I mentioned just now). In plan, each half palace consists of three wide halls separated by narrower galleries. Each building is almost square, being about 456 ft. by 453 ft., with an external arcade, details of which you will see on one of the screens, and are worth your close attention.

Now for the Château d'Eau, M. Paulin's chef-d'œuvre, placed in front of the Palais de l'Electricité. It was built on rubble piers, at the head of the immense slope where the fountains and basins were laid out. Its principal feature was the vast architectural niche, 24 metres in diameter, from the head of which issued the water, the fall and jets being arranged in a very artistic and original manner. Most of this water was pumped from the Seine and was for the use of the boilers and condensers at work close by, as you will presently hear. Some charming sculpture and statuary groups, with fantastic and impossible monsters were scattered about, and the fountain jets added to the picturesque grouping and happy disposition of the architectural features of this remarkable piece of work.

But it was at night that one felt the indescribable charm, when lighted up by its thousands of lamps in ever changing harmonies of colour, and one carried away a never-to-be-forgotten picture of this fairy-like groto that scarcely seemed the work of human hands.

Palace of Electricity. By M. Hénard.—This was at the rear of, and masked by, the Château d'Eau, therefore the architect raised the roof of the gallery and threw all his inventive genius into the skyline he thus formed, a broad open cresting of metal and glass, like lacework by day, and suggestive of a fairy embroidery by night, with its changing lights. In the centre was a figure symbolic of electricity, borne on a car, drawn by two symmetrical animals, a Pegasus for the poetry of science, and a dragon for its material power, backed by a metal sun 40 ft. diameter, placed at a height of 66 metres, nearly as high as the towers of Notre Dame. The palace measures about 230 ft. high, and its front extends the whole width of the Champ de Mars avenue, 150 metres long. Its construction was entirely of iron and glass.

It was owing to the enormous machinery power for driving the dynamos, &c., in this

building that the vast quantity of water—72,000 litres per minute—was required; this complicated the problem, and resulted in the Château d'Eau being emphasised at the expense of the Palace of Electricity.

M. Hénard had also another delightful work in hand, the Hall of Illusions; two drawings on the walls describe this by a plan and a view of the interior. The astounding effects of changing colour and infinite space that one can scarcely describe were produced by large mirrors and coloured lights.

The Palace of Civil Engineering, by M. Hermant, is the counterpart, as regards size and disposition, of the Palace of Textiles, which it faces. The entrance porch, of which you see a view, with further details on the walls, is 27 metres wide; on each side of this is the usual open arcade and gallery, over which is a fine frieze, 2½ metres high, in an appropriate architectural setting, representing the various means of transport, by M. Allard. The detail gives an idea of it.

Instead of the ordinary iron lathing or wire netting we usually find as the foundation of the decorative plaster work the contractors here used flat sheets of metal punched or stamped out into tongues, which projecting formed the key for the plaster.

The Palace of Education, M. Sortais, architect.—This palace, covering over 27,000 square metres, is similar in its general lines to its fellow opposite, the Palace of Mines, first described. Its angle pavilion is very charming, best illustrated by the drawings, with the delightful campanile of about 150 ft. high.

The steel construction of this and the last described building (Civil Engineering) was exceedingly economical, being built up entirely of small sections, which meant easy handling, quickness and facility of construction, and cheapness of execution. We again find the open gallery or loggia which was imposed on the architects of the neighbouring buildings.

The Salle des Fêtes, by M. Rautin, was one of the attractions of the Exhibition, and is destined, I trust, to remain for some time to come, although its fate is not yet settled. It must be remembered that the old Machinery Gallery of the 1889 Exhibition remained standing, and was absorbed into the 1900 one, but the centre portion of this was screened off, forming a square in plan (although the impression to the spectator is a circular plan) and will accommodate 20,000 to 25,000 people. Its dimensions are 535 ft. by 460 ft. on plan. The dome is 300 ft. diameter, and is 147 ft. from the floor.

It may be that by now it is decided to remove the whole of the old Machinery Gallery, including the Salle des Fêtes, in order that the facade of the Ecole Militaire may be shown more adequately, as intended by its architect Gabriel. This scheme is favoured by M. Bouvard, Architect to the city of Paris, who wishes to turn the Champ de Mars into a fine public park, but the public and the Press are very much against it.

Two artistic façades form the screens which divide the hall from the two ends of the Machinery Gallery. Models and studies were made for this hall to a large scale, allowing all the details to be seen and worked out, leaving nothing to remain to be executed at haphazard. The result was something charming. The coloured glass dome was most happy in its effect, not vulgar, but very soft, the ceiling paintings and reliefs were things deserving of a permanent shrine, and the ironwork supporting the dome and roof was most graceful. The study of this charming interior would well repay a careful student. Unfortunately, I could obtain no slides to adequately show the effect of the interior, but on the walls are some details of the decorative work in painting and modelling. The four great panels were by M. François Flameng, M. Rochegrosse, M. Maignan, and M. Cormon.

Before leaving the Champ de Mars there are a few little buildings at which we might glance, to see the festal character of the pavilions erected for the purposes of the shows and attractions. The Luminous Palace, the creation of M. Ponsin, carried out by M. Latapy, on a special site near the Eiffel Tower. Glass formed almost the entire material of the structure, and at night the whole was illuminated, walls, columns and all, by electric lights skillfully concealed, and arranged to change the colours at will.

The next is the Women's Palace, for the exhibits connected with the fair sex, and is a type of the temporary structures I am speaking

of. It shows the French are not afraid to spend both brains and money on merely ephemeral buildings, and to do their utmost to carry out our own motto, "Design with beauty."

Next we have the Pavilion of Ecuador, at the foot of the Eiffel Tower, which is rather more flamboyant than the last.

Lastly the Café de la Belle Meunière, known perhaps to some of you who are fond of interiors.

Turning our attention to the buildings on the left bank of the river, beginning at the west end and proceeding up stream, we see first the Globe Celeste, the most unfortunate of the private speculations of the exhibitors. Undoubtedly most valuable from an educational point of view, and certainly bearing a charm of its own with the architectural character of the base and setting, this side show suffered by the alarming accident that happened in the early days of the Exhibition, when the bridge leading to it from the Champ de Mars fell down during the process of striking the centering, and the show was at once closed by the authorities.

Then we come to the Palace of Forests (with Sport generally), over 600 ft. long on its river front, constructed entirely of wood, and decorated with the various forestry exhibits and ornamental timbers. It was designed by MM. Tronchet and Rey, who were also entrusted with the neighbouring Palace of Navigation. This was also on the river front, beyond the Pont d'Iéna, with a façade of 480 ft. long. This also was a timber structure, built in a fashion similar to our steel construction, and covered with "staff," the decorative details being most charming, suggested by slips and their trimmings, and affording materials for many hours' sketching.

After this is the Creusot Pavilion, the exhibit of the great firm of Schneider, who carried out the steel work of the Pont Alexandre III., a huge domed pavilion, painted in red oxide. Why this hideous structure, out of scale and colour with its surroundings, was allowed to be planted down on the river bank, and spoil the otherwise picturesque view, I cannot conceive. It should have been relegated to a back site. Its construction was very interesting, in spite of its ugly appearance, and well repaid study, but its position was unhappily selected. The diameter of the dome was 140 ft. and in height it was 105 internally; this was covered with a lantern or belfry. The framing of the dome was of twenty-four curved plate girders, connected at intervals horizontally by box girders, the lower ends of the ribs resting on steel roller bearings.

The dome itself is of cement slabs on a wood sheathing, although the colour it was painted was the contractor's usual coat of red oxide of iron, that suggested iron wholly in its construction, and deceived one so much that one began to hunt for the rivets that were not there. The entire weight of the lantern and dome was some 400 tons.

Another constructional point to be studied was the system of covering the railway cutting which ran under a portion of the site.

Within was one of the famous Long Tom guns, on a revolving stage.

Then we pass on to the Army and Navy Palace, or, to be correct, the Palace of the Land and Sea Forces, an immense building, bordering on the river, for more than 340 ft. in length, designed in a style more or less mediæval. It was built of wooden framing, trussed up with iron tie rods and bolts, and the plaster covering was attached in slabs nailed to the timbers, then an external finishing coat, and the decorations were laid on this.

Next came the Palace of Hygiene, of which I have no illustrations or drawings.

After that the Pavilion of Mexico, one of the streets of foreign nations that I shall presently deal with.

Passing on and crossing the end of the Pont de l'Alma, by another of those picturesque footbridges already mentioned, we enter the Street of Nations, which for the moment I will pass over, and come to the remainder of the Exhibition buildings on the Esplanade des Invalides, returning afterwards to complete our tour of the Exhibition by the Rue des Nations.

In order to preserve the vista ending in the dome of the Invalides, for which the Avenue Nicholas II. and the Pont Alexandre III. were designed, M. Picard, the Commissioner, arranged the palaces of the diverse industries on each side of the continuation avenue. Two

half palaces at each end and two others in the centre form the group that borders on the east and west sides of the Esplanade des Invalides, all too narrow in width, I may remark. Looking towards the dome, the buildings on the left were reserved for French work, and those on the right for the various foreign nations. All are of the lightest possible construction consistent with safety. Their contents were the exhibits of those industries that minister to luxury and to the surroundings of our public and private life.

The two palaces facing the quay are those of the National Manufactures, with curved porticoes, the work of MM. Toudoire and Pradelle. The slides and drawings will give all the details, and illustrate more fully than my description the richly decorated architecture. In extent these cover a surface of 12,000 square metres. In the large wall surfaces and panels are fine allegorical frescoes by such eminent men as Paul Buffet, Vauthier, Chabas, and so on.

Of the two centre palaces, that on the left looking south, is by M. Esquie, and is balanced on the right by one similar in extent, and following the general lines, by MM. Larche and Nachon, the delightful details of the latter being suggested and based on the French flora, and reflecting great credit for their freedom and vigour on the designers and sculptors.

These palaces are to shelter the exhibits of the various industries connected with our homes, such as decorative furniture, window glass work, goldsmiths' work and jewellery, bronze and iron work, and so on.

Unfortunately, I have no slides to show either of these in a proper manner, but on the screens are several good drawings and photos of both palaces.

The next four slides give some of the details of the forms taken by the decorations, based on the flora of the country:—A campanile, capitals of the first-floor arcade, an angle cartouche, and keystones of the arches. These show the originality brought to bear on the temporary works of this portion of the Exhibition.

At the south end of the esplanade are two half palaces by M. Tropey-Bailly (for ceramic work, which showed up very strong in this Exhibition, and for glass work), with the wonderful Invalides front, on the Rue de Grenelle. This elevation consists of two symmetrical façades, with an exceedingly well treated frieze in bas-relief representing the Decorative Arts and Labour. Notice must also be taken of the graceful pinnacles in white and gold, and of the two pavilions immediately inside the entrance, with the semi-circular hallowed fronts forming a charming little circus. The grouping, and, in fact, the general arrangement and treatment of M. Tropey-Bailly's work is most happy.

In front of the half pavilion here shown stood a remarkable exhibit of Sèvres ceramic ware, the fountain, which may be seen in some of the views. This is destined to stand in the Champs Elysées after that thoroughfare has recovered from the upheaval caused by the Exhibition works.

The portico, too, also in Sèvres ware, which also stood in the Esplanade des Invalides, is destined to be re-erected in the Square of St. Germain-des-Près, or its immediate neighbourhood.

The Street of Nations.—This I will describe in the reverse order to the way we have travelled. The more important buildings are near the Pont des Invalides, where the Rue des Nations commences.

Italy has on the Quai d'Orsay the largest and most imposing of all the foreign pavilions, a florid building in fifteenth century style, consisting of a cathedral-like structure, with suggestion of Venice, Florence, and Pavia. This has a central dome with four angle cupolas, all gilt. The windows, which are very large, are filled with tracery.

The interior is very imposing, but suffered by the crowds of stalls for the sale of so-called works of art and small mementoes, destroying the dignity of effect that otherwise would have had an effective charm to a person who could be left alone to enjoy it, but the pity was you could not be left alone. The architects were MM. Carle Coppi and Salvadori.

Turkey.—Of this I have unfortunately no slide, so must refer you to the long panorama on the wall and the photos on the screens. The Ottoman Pavilion is more modest than the Italian and has more reserve, and the work was

entrusted to a French architect, M. Dubuisson, who has suggested one of the innumerable mosques of Stamboul.

United States.—A bold and dignified building, with a great porch on the river front, forming the background to the equestrian statue of George Washington. The building is simply planned, and effect is produced by the lavish use of statues, groups, and the omnipresent American eagle. Other features to notice were the well-lighted interior, the bold staircases, the number of lifts, and the colour decorations. The architects were MM. Coolidge and Morin-Goustaux.

Austria.—The architect was M. Baumann, who has produced a pleasing exterior suggestive of the Louis XVI. style, but partaking of the nature of a hunting-lodge ornamented with grotesque beads, festoons, and garlands.

Bosnia.—Nothing is worth particular mention in this building except that the wooden eaves are very bold and the corbelled-out balconies are suggestive of Turkish work. The architect was M. Panek, who adopted rather a rural style for his composition. Its scheme of decoration was in blue and white. The tower represented a kouba, or old Bosnian dungeon.

Hungary.—This was rather a medley of styles, embodying nearly all that had existed since the foundation of the Magyar State. MM. Zoltan-Balint and Jambor, of Buda-Pesth, were the architects. The south side, on the Quai d'Orsay, was Romanesque; the north, or river front, was Gothic; the tower was a reproduction of a church tower with an unpronounceable name, and the doorways were also exact reproductions from other churches. The Salle des Hussards (see view) was a notable feature of the interior, with an original decoration.

The British Pavilion, very small beside some of its neighbours, and of which I could not anywhere obtain a slide. It was intended by the British Commission to make this the special show of our native construction and decoration, and the plan decided on was to reproduce an old English manor-house. Mr. Lutyens was entrusted with the commission, and he has given us in the north front a replica of that of Kingston House, near Bath, the other façades being adapted from contemporary buildings.

Its construction was entirely of steel framework, for easy and future removal, for which Sir B. Baker was responsible. Various well-known firms undertook the decoration and furnishing of the interior. The City of Bath sent the pieces of Elizabethan work in the Library; the great gallery was adapted from the Cartoon Gallery at Knole, near Sevenoaks.

It would be impossible to name in detail all the firms who have contributed, but I must here thank Mr. Geo. Wragge for the loan of some photos and a cartoon of his stained-glass windows in the dining-room. These are on the walls and may be seen afterwards.

This has been dismantled, and possibly at the present moment has been entirely removed.

Belgium.—On the other side of an open space, on which abuts the British Pavilion, is the Pavilion of Belgium, an exact reproduction of the Town Hall of Oudenarde, with all its florid Gothic detail and profusion of carving. This was entrusted to MM. Acker and Mankels, who preferred to present to us the masterpiece of Flemish work in the sixteenth century (1525-1530). Now destroyed.

Norway has arranged a pavilion distinct from Sweden, and the commission was entrusted to M. Sinding-Larsen. Its style was peculiar, and it was entirely constructed of wood, lavishly coloured.

Germany, which comes next, has quite a festal appearance, with its elaborately-coloured walls and exuberant detail. Inside there was a fine rich staircase, wall paintings everywhere.

Spain.—Next to it, in this view, is the Pavilion of Spain, the work of M. Urioste y Velada, who has suggested the Sevillian type of architecture, the details being taken from various well-known buildings of the Renaissance. It was planned round a central courtyard or cortile, formed with colonnades and balustrades, one lofty tower and others more modest. The whole was very dignified in effect.

The pavilion has been recently destroyed, fetching about 1,000l.

Monaco.—Next we see the Pavilion of Monaco, the little principality that has made a big show. In this view, before we leave it, I will point out

also the Pavilion of Sweden. Monaco has presented us with an Italian type of architecture, and a fine tower suggestive of the Palazzo Vecchio in an imitation granite.

On the return front is a double loggia, the vault of the upper one being decorated in a scheme of blue.

Sweden.—An extraordinary building, which I confess I am unable to describe to you. But the wall picture will sufficiently illustrate anything you may wish to use up in your next competition. M. Boberg was the architect.

Greece comes next, the production of M. Magne, architect, in the Byzantine style, a brick (or imitation brick) building with a stilted cupola covered with red tiles.

Serbia, almost the last of the range before we reach the Pont de l'Alma, affects a florid type of Byzantine, an octagon dome over the centre, and external arcades rather highly coloured. Small cupolas cover the angles. M. Baudry was the designer.

It is at present uncertain if any of these foreign pavilions will be preserved, for the matter is still under discussion. Several schemes are yet in the air, but in all probability the whole, or the majority, of them will be removed.

The Chairman, in inviting discussion, said they must all have been greatly struck by the excellent way Mr. Wonnacott had made use of his time in Paris, and the interesting manner in which he put before them the knowledge he had acquired. The way in which Mr. Wonnacott had dealt with the inception of this great Exhibition and then of the organisation by which it was brought about and the construction, science, and art shown in it, would be of great value to all of them, and he congratulated Mr. Wonnacott on his effort to carry out the spirit of the prize, which he won in competition with several other candidates.

Mr. C. H. Brodie briefly proposed a hearty vote of thanks to Mr. Wonnacott for his paper and for bringing before them such a splendid collection of drawings and lantern slides.

Mr. Bamford Slack said he seconded the vote of thanks with considerable pleasure. In the course of a ten days' visit to Paris last year he had endeavoured to see the fringe of the Exhibition, but he had found it impossible to look more than into the corners of it. He was not an architect, and the features which struck him as the most interesting were not necessarily the architectural beauties of the Exhibition, though wherever one looked one could not fail to be struck by the beauty of many of the buildings. The fact which struck him, as a layman, most was that although the buildings were of such enormous size, they were so beautifully proportioned that one did not dwarf the other. In the case of the Grand Palais, it did not dwarf the Petit Palais, which was so closely opposite to it, and one did not realise its massiveness, so well as it proportioned. Looking at the Exhibition, quite apart from the architectural point of view, there were five features which pleased him most, viz.—the British Pavilion, with its exhibits of all that was best in British art; the Petit Palais, which was crammed full of the art treasures of France; the Grand Palais; the tapestries in the Spanish Pavilion; and the German collection of French pictures made by Frederick the Great. The Château d'Eau was exceedingly beautiful at night. But, to his mind, the most wonderful thing in all Paris—in all Europe—was "that wretched thing," as the lecturer had called it, the Eiffel Tower, which he always regarded as the greatest triumph of the skill of man that Paris could show. He said that at the risk of shocking the feelings of architects; but he could not help feeling that the Eiffel Tower was a wonderful monument of what man could do with a few bars and rivets of steel.

The Chairman, in putting the vote of thanks to the meeting, said that one result of Mr. Wonnacott's paper was to show them the state of art in France at the beginning of the new century. It showed how insensibly the functions of the architect were being changed by the architect being placed in co-operation with the engineer, and it showed how essential to the training of an architect was some knowledge of science and scientific construction, as well as the principles of art. No doubt that tendency would become more pronounced, and though the functions of architects and engineers were in a way separate, yet it was most desirable that the members of those two professions should understand

better the work of one another, and he hoped before long English architects and engineers would work more in alliance than they had done in the past and were doing now. At the present time the importance of this did not seem to be realised, and it would be impossible under the present order of things to produce in London a bridge like the New Alexander III. bridge in Paris—not only because we had not the same art feeling that the French had, but because the public had no notion of the absolute importance and necessity of an alliance of an architect or architects with an engineer in the production of a monumental structure like a bridge over the Thames.

The vote of thanks having been heartily agreed to,

Mr. Wonnacott said he had only read a portion of the report which, in fulfilment of the conditions imposed on him, he would submit to the Association. He should like them to include in the vote of thanks the name of Mr. Lutyens for his kindness in lending for the occasion his drawings of the British Pavilion, to Mr. Geo. Wragge for his kindness in sending one of the stained-glass lights, and to the Royal Institute of British Architects for lending him several of M. Charles Lucas's collection of drawings of the Exhibition.

The Chairman announced that the next meeting, after the special general meeting previously referred to, would be held on March 15 when Mr. H. B. Measures would read a paper on "Rowton Houses."

The meeting then terminated.

THE SURVEYORS' INSTITUTION.

THE following is the remainder of Mr. Thomas Blashill's paper on "The Present Condition of the Building Industry," which was read before the Surveyors' Institution, Great George-street, on the 25th ult, and the first part of which was printed in our last issue:—

"The trades-union is a natural engine for accomplishing what the isolated craftsman cannot bring about for himself. If it had been instituted in these days, when every section of commercial and professional life, however small, has its society to look after its interests, nobody would have given the matter a thought. If its methods differ from societies of another class, it is because the wants of its members are different and must be differently met. From a perusal of the rules, kindly given to me, of some important trade societies, I fail to see anything to which reasonable objection can be taken by an impartial person. Apart from unemployed and sick benefit and the preservation of internal harmony, their object is the protection of the trade rights and the privileges of the members. They go beyond the rules of our professional societies in certain matters, as in the limitation of the age at which a person may enter the trade, but that can only apply to their own members, and if we should think such a policy advisable we could do the like. If they prescribe the lowest rates at which their members may work, so might we. The constitution and proceedings of branch societies are very strictly regulated. It may be that those proceedings are with equal strictness supervised, though I do not see how this is done. But as the union must to a large extent be responsible for the conduct of its branches, that is a point of some importance, and I shall have more to say upon it. So far as the union is concerned we may look upon it as the thinking soul of a body every particle of which is supposed to contribute to the process.

With the regulation of wages and hours of labour, important as such details may seem, I shall not concern myself. These are regulated, not on any fixed principle, but with reference to time and place and circumstances, and so are many other trade regulations, and though these must not be overlooked, they are dwarfed by comparison with the great principle at the bottom of disputes between capital and labour. To put the matter in a nutshell, it is the prevention of "sweating" and the improvement of the position of craftsmen as a whole. In this consideration questions between payment by time and payment by results play a leading part. Not that, in the eyes of the workman, there is anything specially sacred in either alternative. There are now far more workmen, trade unionists, paid by the piece than are paid by time, and the principle of payment by the piece is as

stubbornly fought for in certain trades as is payment by time in others. The question is by which system the dangerous and abhorrent practice of "sweating" can most effectively be prevented. If a man is working with a machine that can be driven at an increased speed, at the will of the employer he can be made to turn out an ever-increasing quantity of work while his wages may remain the same. That is day-work "sweating," and in such a case it is only through payment by the piece that the machine hand can get a fair return for his increased labour. But if men are working by the piece at a pace regulated only by their own strength or energy, the man who is the strongest and the quickest will earn the most, and the employers may lower their rate of pay not only to him, but to the workmen all round. This is piecework "sweating" combined with individual bargaining, and the building industry is one of those in which from bitter experience it is resisted with might and main.

I am not quite sure that sweating is inevitable with piecework, but before discussing that matter we will try to see what day work really is, the fair day's work for which a fair day's wage is the equivalent.

The late Baroness de Bunsen, the daughter of a very capable mother, tells how that mother when placing some additional household duty upon her would say, "It is all in your day's work." She adds, "That idea of a day's work, as much as one's strength can perform and no more, but not less, and limited to a term, the day, was always fully satisfactory to me, and it is equally satisfactory now." That is the notion of the energetic house-mother who, so long as she is awake, must always be doing something for her home and family. It also describes the habit of the energetic man who is working for himself. But if such a task were put on the shoulders of men in a free country, paid by the day or hour, it would not be borne.

It would bring us back to the fourteenth century, and the struggles of the bondmen, who thereby, and by many a struggle since, have reduced the day's work within bounds more reasonable, if less easily defined. The day's work, even in the eyes of the employer, is not a day of exhaustive toil. Perhaps it may, at the highest, be defined as so much work within fixed hours as can be done by the ordinary workman comfortably—that is, without injury to his health and without diminishing his capacity for enjoying the rest of the day as he may think fit. I put it as high as this because the day's work is a valuable commodity which he has to sell, and if he unduly diminishes it he must in the long run be the loser. But, in practice, the day's work will be so much work as the workman and the employer with this knowledge before them are fairly contented to give and to accept at the date and under all the circumstances. There must be security against sweating, but if the workman puts in much less than this he runs the risk of outside competition, encourages the employer to look out for cheaper ways of getting the work done, or even diminishes his desire to have it done at all. I know it has been said that labour is not a commodity in the ordinary sense; but "labour" is often confused with "time" with mischievous results. Not workmen only, but the rest of us, get into a habit of talking about our "time" as if it were something valuable by which money ought to be made. But mere time is worthless to any one except the owner, perhaps to him. No employer would think of paying for it. We are confusing the means by which a thing is measured with the thing itself. This notion of payment for time seems to be at the bottom of the aversion which some thinkers on the labour question feel to treating labour as a commodity to be dealt in by purchase and sale. It would be doubt to be a hateful thing to buy and pay for so much of a man as his necessity forced him to sell. What the employer really buys is so much improvement to the material which he puts before the workman as may reasonably be expected to be done in the time by which the payment is calculated. This is simply measurement by the town clock instead of by the 5-ft. rod, and if a day's work were a fixed quantity the clock would measure it as accurately and much more conveniently than any scale of feet and inches. So long as clock measurement is fairly used by both parties, without hurrying or chasing on the one hand and without loitering on the other, its record should be fairly satisfactory. But if we look

at the matter honestly or guilefully, it is impossible to get out of the fact that directly you interfere with the rate of work, payment by time becomes piecework under another name. Not only from what I have said, but from a study of the disputes which often arise over the day's work is this evident. When we come to the question of loitering I will give two or three illustrations of this.

The desire to have an easy life is common amongst time-workers of every class. A great modern novelist found subjects for his satire among gentlemen engaged in the public service, and one has heard of conspicuous instances in real life. In fact, short hours and light work seem to have been traditional in times past in certain offices. A few weeks ago there died a very aged gentleman who could recall the time when his office hours were from eleven to two, while the holidays were just as exemplary. If a workman is merely idle, he is only like many more of us who prefer an easy time. An employer must recognise that, and take his chance of being recompensed by extra energy in some other quarter. But when men are working together so that all must go at the same pace, the pace will be that of the weakest, the least energetic, and the slowest. In such a case health and strength and briskness go for nothing, and to the employer it may be just the same as if his whole staff on that particular work had been recruited from the class to which the feeblest among them belongs. A judicious employer will therefore select his slowest hand with some care.

There is, however, a far more serious matter than mere idleness. It is the deliberate loitering of which employers have long complained, the effect of which is to prolong the job so as to delay the day when the men will have to be paid off, or so as to keep the work longer in hand for the benefit of workmen in general. I am disposed to put down the few bad cases that came under my notice to natural idleness with lax supervision; but this is not the view taken by such employers as have dealt with the subject. The reading of a paper by Mr. Brassey, now Lord Brassey, at the Royal Institute of British Architects in 1878 brought out much evidence on this subject. Messrs. Lucas had found that labour on brickwork which had been estimated on previous experience to cost 2*l.* 17*s.* 0*d.* or 3*l.* 3*s.* 0*d.* per rod actually cost 5*l.* They found that although they had provided machinery which should have made up for the recent rise in wages, the cost of building had actually increased by 20 to 30 per cent, the cost of materials remaining practically unaltered. This, they say, was entirely due to the small amount of work done by the men. They found, in fact, that men did little more than half the work for ninepence per hour than they formerly did for sixpence. Mr. Lucas said that the unions forbid piecework, with the object of obtaining "the largest amount of pay for the smallest amount of work in the least number of working hours," so that "the public are hit all round."

One or two architects were shocked because this statement as to work and pay and hours was defended by a trades-union speaker, though I think he had only meant to embody the desire that most of us have to sell our services at a higher rate. But the professional man, whether he may be paid by time or by the piece, manages the matter by raising his charges if he can, while he either goes on giving the same service, or even making it more or better. Wages, like fees, may rise or may fall, but I think we shall be of opinion that the service, if it is not excessive, should remain at least the same. We will make a note of what was said about "the public," to whom I have not yet alluded.

The view of contractors in general on this point may be gathered from a list of lowest tenders extending from 1880 to 1898, in which stock brickwork rose from 11*s.* per rod to 20*s.* and even to 22*s.*; a rise of 100 per cent. But no item in the cost of brickwork had risen very seriously except bricks, which had gone up 30 per cent. Bricklayers' wages had risen only 10 per cent., and the explanation given by contractors was that the men did less work. Contractors have been saying recently what was said twenty-three years ago, "It is impossible to calculate beforehand the cost of labour." Contrast this with the labour on the rapid construction of America, where, as the *Times* correspondent says, the engineer watches his machine even during his meals, and where an English traveller has recently reported that every one saves time and does

his best for his employer. For all this there must be a reason.

I have quoted enough to show what employers have publicly stated as to loitering and what their tenders prove. One instance was given to show that it was systematic. Some Gothic capitals, for which 5*l.* each had been provided, were given to the men, and the first one cost that sum or less, but the others cost 8*l.* each. It was explained that the shop steward had said that they were worth this sum, and they must be made to come to it. Many similar cases have come to me at first hand. A foreman set a new hand to do some piece of joinery which he considered would be finished well within the day. After an hour or two he noticed that there was practically no progress, and, on remonstrating, the man replied, "This job is a day and a half;" so they parted, and it was done in half a day. This is fixing the quantity of work to be done for a day's pay, and is really piecework disguised as daywork, and it points to a system well enough understood to be acted on by the individual workman without the help of a shop steward.

Another instance carries the matter much further. A foreman on seriously discussing with the leading hand or perhaps the shop steward, on a job, the delay plainly evident, was told that the amount of the contract for the particular work was so much, there had been three-fourths done, and the cost had only been so much; there was, therefore, no occasion to complain as yet. Upon that view this was not merely piecework, it was partnership—a limited firm in which one partner took so much as he considered to be reasonable, leaving the other, who had no voice, just so much as ought to be left for him. The mischief of this reaches further. If this division of the profits were frankly understood the men might finish off the work at their own pace, and take their share. But being on daywork they can only take it out in hours, and however the employer or the public may suffer by the delay, delay there must be. The sagacity of the plumbers of Chicago has shown them a more excellent way. They fix what they consider their day's work of seven hours, do it in five or six hours, and take their full day's pay. Surely this is piecework pure and simple!

In the discussion of 1878 a labour leader met all statements as to loitering by laying the blame on incompetent foremen. He said a foreman should know how much work a man ought to do. So he should, no doubt; but the foreman's story is that it is useless to attempt to get more work even by turning off men when the new hands do only the same as the old. My own impression is that this is scarcely true. A foreman is of real use when he is good-natured and firm, and has at his back an employer of good position, but who may be depended on to shut up the work when he feels he is being badly used. I think this is the reason why certain employers of high standing can get work done cheaper than some others.

There are many things charged against workmen besides loitering. Some of them, though very troublesome to the employer, have grown out of a reasonable anxiety to prevent disputes among their fellows in other trades; others appear to be the fag-ends of old trade customs; others arise out of the splitting up of a trade into branches, which, under certain circumstances, has its convenience, but they may be mere substitutes for loitering. There are also impediments of progress in work caused by a genuine anxiety to keep their trade free from intruders—at the expense of the employer. And in certain trades there is grave obstruction caused by a bigoted adherence to a rule against overtime, even when an emergency occurs that demands some trivial relaxation.

The demand for skill of various kinds, the diversity of materials and the necessity for different tools, must naturally have suggested the division of the building industry into separate crafts. The principle is good if not carried too far. Work in stone differs radically from work in wood. Carpenters differ just enough from joiners to justify division so long as convenient. "Three-branch" hands may flourish where work is scarce and lies wide, but they become one-branch in busy towns. Workers in brass and zinc and tin and iron may be divided so rigorously that an article passes through half-a-dozen hands when it might be finished by one or two. When it took ten men to make a pin I suspect that

about five of them were practically lookers-on, till the machine produced a revolution that swallowed up not the five only but the ten. That is a melancholy but common story.

What is convenient when you are manufacturing by the gross may be folly when a single article is in question or in case of an emergency. If there is to be no elasticity, a bricklayer, however handy he may be with his trowel, could not stop a rat-hole in a plastered wall. The frequent disputes amongst bricklayers and plasterers and tilers that engage the attention of unions, arbitrators, and the Labour Department of the Board of Trade may lend interest to life, but these battles should not be fought at the expense of the employer or ultimately of the client.

By all accounts the plasterer gives more trouble by his trade regulations than any other craftsman. He claims work that other workmen think to be theirs, and he insists on doing his own work in an expensive way. In an important provincial town, after a strike over the allotment of some work to floors between plasterers and bricklayers, an agreement was come to, and after further delay, through disorganisation, the work recommenced. Then the plasterers objected because the labourers wheeled the plaster or mortar in on a barrow instead of carrying it on a head-board; they objected again because the labourers mixed plaster for cornices on a board with a trowel, and so it had to be mixed in a bucket and stirred with a stick. In a building some little cement work had failed to be done on a Saturday so as to be hard and ready for other trades to follow on next week. The foreman plasterer, to avoid delay, remained behind for ten minutes and did it himself. This was seen and reported to the local lodge, which fined him a pound for working overtime, that being strictly forbidden. The rules, in fact, seem to have been so strict as to forbid a concession to the convenience of the employer not much more onerous than any workman might, out of mere politeness, make to a stranger in the street.

I need only refer to such matters as limiting the things that may be done by labourers, and the loads that may be carried, and the tools that may be used by workmen with the object of delaying the work or getting out of it as much money as it may be supposed to owe to the workman. When in early youth, I saw on the Continent certain tools that did their work quickly. I was told by an old workman that they were well enough known here, but they were "unfair" tools, because they got through work too fast. I should like to show him now a machine that does the work twenty times as fast. And, to mention another subject akin to this, the dependence of a grown man on work that in most other countries would be done by boys or women in the expectation that a "living wage"—enough for himself with his household—can be made out of it, is risky, to say the least. Besides the effect of machinery, of articles ready made, and of imported goods and outside labour, besides, even the great questions of work lost and building projects abandoned, there is the exceedingly important question of work lost to trades by changes in modes of construction, apart from the policy of employers or employed.

The demand for fire-resisting construction has already affected very seriously the trade of the carpenter. In London and other places public buildings and many others must by law be constructed very largely in fire-resisting materials. Fire-resisting floors are necessary over certain shops, and will probably be demanded over all. I have found floors of steel and concrete cheaper than good floors of wood. As an examiner in building construction, protests reached me against questions on the framing of floors, because that subject was all out of date! Timber partitions are out of date, and for a large class of buildings wooden roofs will follow suit. In rebuilding the Cripplegate area after the great fire, hardly a roof has failed to be voluntarily made fire-resisting. If the rise in the price of timber is maintained the use of substitutes for carpentry and joinery will be automatically increased. Asbestos that can be fixed dry is dangerous to the joiner as well as to the plasterer; whatever work steel and concrete cannot do it will. The wooden staircase, with scientific handrailing, is gone from important buildings, and wooden lining to the walls and ceilings is gone; all with enthusiastic final arewells! Such losses are beyond preven-

tion, but there are others which might be temporarily staved off.

Masons' work, which for a time recovered its place after its long struggle with imitative cement, has now to compete with cut brick-work and the more threatening terra-cotta (the work of the potter) in most of our finest buildings. It is said that this change was brought about by a masons' strike, but, as a fire resisting material inside or outside a building, stone as hitherto used in the City of London is discredited finally.

In the case of the plasterer, trade disputes are dangerously interesting. From the nature of his work he is the most unpopular artificer to have about a house. In a new building just as the walls are getting dry he comes in and makes everything in a mess for two months or three. Then they have to be dried again. Every effort is being made to dispense with him. Lath and plaster work is forbidden in fire-resisting constructions. There are a dozen substitutes for plaster—none, perhaps, quite so satisfactory. A single architect is now using one of these by the acre. Brickwork is being left bare or painted or whitewashed or "dinged," or covered with prepared papers or linocrusta or compo-board or incombustible panelling. Walls that fifty years ago would have been covered with plaster are now finished with glazed brick, or even terra-cotta.

But the plasterer seems to have let slip the artistic and interesting branch of his work. Old ceilings that in this country used to be covered with ornaments, cast or worked in situ, ceilings that all over the Continent are now elaborately ornamented, are being done in imitative materials. The richest panelled ceilings are put up in stamped steel. All this while the County Council is giving fabulous thousands to preserve a house in Fleet-street rather than ruin by removal its ceiling, which is a relic of a decaying art.

May we not detect a process something like this in rapid development? All work that requires special skill is getting done by men or by processes outside the regular trade. Work of the simplest kind is being taken up by machinery. And machinery is rapidly encroaching on that which is left between these two. I find in the church records of a small provincial town that, four hundred years ago, when they required a new image of the highest object of their reverence, they employed the very man who hung a gate, mended the bell frame, or set up a pew. When, in early days, I drew and modelled a coat of arms badly, the village mason saw the point and carved it well. His predecessors had furnished the churchyard with tombstones that art enthusiasts now sketch and publish. When I asked one who undertakes stone-carving in a large way whether his men were made out of the better sort of masons, I found that this was not so. The fact that a stone-carver holds his chisel just a shade differently from a stonemason does not seem an insuperable obstacle.

I will only say of brickwork, which seems the least liable to be supplanted, that concrete is encroaching upon it fast—concrete that just failed to become a dangerous substitute twenty years ago, when brickwork was hardly more than half its recent price—concrete that is unskilled labour, that makes such admirable partitions and such reliable retaining walls.

Not merely from curiosity I said to a very enlightened man who is turning out wood-work made with the newest machinery, "I suppose you catch intelligent joiners for this." He said, "No, I begin with the raw material, find a man with a turn for machinery, and we teach him the little joinery he need know." Still, joiners are largely employed in this way, but they are employed in doing the work that it would take many joiners to do by hand, or in fitting together and fixing work from the machine. Not only in the joinery trade, but in others, the enormous quantity of work that is bought by the builder ready made, or is imported, is competing with the contractor's workshop and developing a class of men who are fitters and fixers rather than all-round craftsmen.

At this point it will be convenient to look a little more closely at that which is the real basis of discussion on labour and wages, of negotiation, disputation, and it may be, of quarrel—the work that for whatever reason has to be done. I notice in a certain class of literature a tendency to look upon the work that is going on at any particular time as something that can be and ought to be shared out

fairly between the whole body of workmen; or, to take a narrower view, among those of them who belong to a particular organisation. It would be highly convenient if by some means we could so arrange that at all times the number of workers and the amount of work might be made to fit. In default of this we have to handle with our own clumsy and unaccustomed fingers a mechanism of infinite delicacy easily put out of gear. In dull days of depression before the faintest whisper of improving business has been heard; long before the client has dropped the first hint to the architect; even before he has felt the impulse within himself, there has sprung up through influences quite unforeseen, the genial breath that in due time refreshes and revives. Foreknowledge of this would be priceless; the after-knowledge may be read in any paper, and is dear at a penny. Meanwhile let us do as little mischief as we can.

We have to understand and practically apply the truth that every rise in materials, from whatever cause; every increase in wages, however well intentioned; every check placed on the turn-out of work acts with unflinching certainty upon the mechanism I have named with an effect in proportion to the cause.

When the cost of building rises, designs already prepared are "hung up," dimensions and qualities are cut down, buildings are abandoned, the desire to build declines. The builder looks out for cheaper methods of construction and quick working machinery; hand labour is dispensed with; foreign manufactured stuff is imported, and in all ways work is lost to the English workman.

All this is consistent with the appearance of prosperity in trade. The Board of Trade returns show an extremely low percentage of unemployed in the building trades; they do not show the amount of work that is leaving those trades, that is even leaving the country through rises in prices and from other causes which are no less important; and though it is no special business of ours just now, briskness of trade in reference only to the number of workers engaged proves nothing as to the general prosperity of the working class, for if there are numbers kept out of a trade who in the natural course of things would be in it, they have to make a living in some other way, and probably overcrowd other trades. But the whole question seems to deserve careful investigation by some impartial authority. There can be no difficulty in ascertaining from documents the real relation between wages paid and work done, and there can be no insuperable difficulty in estimating the amount which might reasonably have been done.

Practical Englishmen as we are, our mode of dealing with the three chief elements of the labour question, time and pay and work, would excite the emotions of a philosopher of either school—the grave or the gay.

We measure the working hours by the nicest instruments that science can produce, the sun's inconsistencies being detected and exposed. Hence comes the signal which calls the workman to his labour, and that which, at the appointed instant, arrests his impending stroke. The coin that rewards his day's work is weighed to the estimation of a hair, and warranted with all the pomp and ceremony of Goldsmiths' Hall. And yet, on this side the Atlantic, no workman, no employer, no public authority, seriously attempts to apply in our own industry any measurement to the "day's work" itself.

After all our talk it was left for the genius of the Chicago plumber to solve the problem. And surely his method of declaring how much should be done in the seven-hours' day, and then claiming the right to do it in five hours for seven hours' pay, is, in principle, transparently honest and conspicuously fair. For our own credit's sake, I am happy to refer to a home-made scheme on similar principles that seems to be acting fairly well in other important industries.

In the tailoring trade, among others, there is a contrivance mysteriously called a "Log." The tailor works either on daywork or on piecework, but his piecework is done under the disguise of daywork, at so much per hour. Every part of a garment has been valued and estimated in time, and is paid for by the artificial hour. If he finishes a "day's work" in advance of the clock he can leave with his day's pay. If he is behind the clock he must put in more time. But, as I understand, he cannot be sweated in a fair shop that adopts the log. There is no individual bargaining.

In arranging for daywork the wage varies according to individual aptitude, both parties having in their mind some reference to the cost of work by the log.

I see no insuperable difficulty in devising for any branch of the building industry a log that may act as a standard day, leaving the wage for the artificial hour to correspond with the wage paid at the time for the actual hour to men on daywork, thus enabling the quick and skilled workman to reap the advantage of his speed and skill, and the less enterprising workman to go on as now at so much a day.

I have formed this opinion with some deliberation, because in the discussion on Mr. Brassey's paper, in which payment by results was very strongly advocated, a prominent labour leader said it was almost impossible to apply piecework throughout a building. But I have before me, and every surveyor has always under his hand, a document called a bill of quantities, in which every item about a building is set down in minute detail. I see a lengthening row of annual price books in which labours are separated from materials and put down in decimal constants. The builder, as contractor, must make up his tender from such separable details, the architect acts upon them, the surveyor digs among them for his daily bread. And yet when the builder, as employer, demands a similar arrangement, he is met with a suggestion of impossibility. That measurement by the 5-ft. rod would cause a hundred times more trouble than measurement by the clock is very probable, and as it is only suggested as a remedy against loitering, this may be used as an argument why the loiterer should mend his pace.

My reference to strikes and lock-outs must be brief. However trivial a dispute may be, the occasion may get magnified to an important question of principle, and for want of a peacemaker at the early stage war may be declared and carried on with a ruthlessness that in the view of the looker-on may be out of all proportion to the point at issue. Whatever may be the occasion, the stoppage of the works of an employer, not only on the job where the dispute arose, but on all his contracts and at his yard, while clients and architects are pressing, while his expenses are going on and his financial engagements have to be met, is a measure that one feels ought by all fair means to be prevented. The general lock-out follows, and after months of loss and suffering to many an arbitrator is called in, who, if appointed at the outset, might have stopped the disaster. It is a very important gain to all concerned that a department of the Board of Trade now invites the submission of disputes to arbitration. The *Labour Gazette* shows month by month what these disputes have been and how they stand or how they have been arranged. More good than appears in print must arise through the establishment of precedents about which the parties will cease to dispute.

The habit of employing a builder to do for you what you cannot conveniently do for yourself has thrown into the background the ancient practice of direct employment, but modern ideas have long been tending that way. It is the distinct and considered policy of certain labour leaders to encourage working without the intervention of a contractor, especially as regards public work. The idea of saving the contractor's profit is tempting to public bodies and to private persons, and the facilities for carrying out the system have been growing very fast. If a client has a fancy to try the experiment, his architect will prepare drawings, and, if he is wise, a surveyor will take out quantities in sufficient detail. He or his trusted agent may proceed to engage a good foreman and workmen, insure against everything, and contract for carting away, buying his raw materials and such scaffolding and tools as he wants for the job. His iron will be ordered long before, and delivered when wanted; his joinery will be imported or got from a manufactory; everything else about a house can be bought from the pattern-books just as easily as it is now selected by the architect. The terms being cash, the lowest quotations may be got; that is proved by experience. The workmen will fix and fit. As they manufacture nothing, no workshops will be required.

At the end of the job, plant and surplus stuff will be sold as a railway contractor would do on completion of his contract. The elements of saving are many. Months may be gained out of the time occupied in completing drawings for a contract. Whether all the con-

tractor's profit is saved may be doubted, but savings in interest on capital, in the prices of materials and fittings, and in salary of a clerk of works should amount to a very considerable sum. Then we are very distinctly promised that the workman will go on faster on direct employment than when working for a contractor, but that would have to be proved. Against these savings must be set off some extra charges for management, but on paper such a plan seems feasible enough. It has actually succeeded in practice, when nothing of importance went wrong.

As to systematic loitering, or other flagrant misconduct, it is certain that a man spending his own money direct would not tolerate it. Not being bound by any contract—that anvil upon which the builder, as employer, can be so effectually hammered—and not being burdened with workshops and expensive machinery, or interest on capital, nor with other undertakings of the same kind open to attack, he could generally afford to wait until men would come forward and carry out his work in a more reasonable way.

It is difficult and disheartening to discard the idea that a company of workmen undertaking contracts might be successful and improve their own position, but after much inquiry I find very little to encourage such a system. Small companies seem to succeed for a time, and then decay through want of business management, or through dissensions among themselves. The best combination I remember in which a contractor's general foreman and a contractor's book-keeper took the lead was as short lived as any other. It may be that in this intricate business there is no prospect open to the workman through the road of co-operation, or it may be that some modification of the system, such as has been tried in France and also in this country, may have better success.

All along, as must have been noticed, I have been harping on that personality outside our fraternity whom I have called the client. My final word about him, like my first, must be to suggest that he is worth more of our consideration than he commonly receives. But I avow that throughout I have been thinking, not so much of the immediate client who comes to us in purple and fine linen, well able to take care of himself, but of that host marching behind him, of which, though indirectly we are the servants and, in a sense, the pioneers. After we have all had our say, the business of the country must be carried on, and will be carried on; for the public is an imperious master that will not wait indefinitely while its servants squabble over the work.

I have been thinking, amongst other grave and weighty matters, of that which is called the great question of the day, which is pressing upon and puzzling every urban authority in the land: the housing of that class who, through one client or another, must in some way be housed. It is the duty of all of us at this juncture, and not of one section of us more or less than another, to take up our fair share of this burden and bear it as handsomely as we know how.

Partly through the scarcity of vacant land, but also very largely through the increased cost of building, nearly all the societies that have been building for this class have had to suspend their work, and it appears to me that unless the cost of building can be materially reduced, for which purpose a reduction of wages is not necessary, rents will very materially rise, not only in such buildings, but in all buildings in every growing town. Whether the effect of good wages will be to attract any considerable number of the working class who are now deserting the country for the town, time must show.

Apprenticeship of the old pattern in which the youth was bound for seven years, during two or three of which he learnt very little and was of very little practical use, is vanishing with other mediæval customs. That the journeymen in a trade should have consented so long to assist in the training of youths who were so soon to be their rivals may be due in part to the obstinate persistency of habit, and in part to the establishment of a kind of understanding that apprentices should be limited to so few that no practical danger need be apprehended from them. But the workmen have deemed it necessary for their own protection to limit much more strictly than formerly the admittance of apprentices into their trades. So stringent have the rules now become that in some trades it is practically impossible to get a boy apprenticed unless he is the son of a

man in that trade. Cases have been mentioned to me in which a master tradesman was not allowed to bring up his own son to his trade.

This may be necessary as a measure of self-defence, and so long as there are enough men in the trade to do the work nobody outside need trouble. But if all the architects and all the surveyors were to combine for the strict limitation of new pupils into offices or new members in their professions it cannot be supposed that positions so lucrative, with prospects so splendid, would not draw in talent quite irrespective of our own interests or our regulations. No doubt the work would at the outset be execrably done, but it would improve day by day, and meanwhile, in whatever fashion, it would unquestionably be done.

Every halfpenny added to the wage per hour, every limitation of the hours of labour, every reduction of the output of work, every addition to the comfort of the workman on the job, every precaution taken and every provision made to protect and insure life and limb is a full-page advertisement for such as are worse-paid, harder-worked, and for whom fewer comforts are provided.

The position of the building operative amongst his fellow men has been improving. There is no reason why he should not, like the poorly-paid French artisan or the doubly-paid American, leave his work at night in a condition as to dress and general appearance good enough for any company into which he may care to go. This cannot fail to appeal to a wider class.

I should like to show you one or two of the board schools in which education is not now directed solely to the production of clerks and university graduates. The children are taught the names and the uses of tools, and to a certain extent how to handle them. You might see three or four hundred boys, with no exception made, taking their turn at drawing, modelling, and rudimentary carpentry or immature engineering. Most of them will go into offices, but not all.

We are yet only at an early stage in the technical instruction of young men. There are institutions in which every kind of help is given them, either for small fees or none, to learn any trade they may wish to take up. At present it is necessary to see that public money is spent only on such as have actually entered their trade, but that is not a rule without exceptions, and the knowledge of tools and processes must very soon become as common as the knowledge of arithmetic.

But I am disposed to think that any increased and more pressing demand for building operatives will be met, as in former times such demands have been met by an influx from the remoter parts of the country where work is slack and the surplus population must go out into the world to gain their bread. And whether as apprentices or as improvers, those of the rising generation whom we are doing so much to train are not likely to ask anybody for leave to earn a living in whatever way they may prefer.

If in my opening sentences on the unity of the building industry I carried my audience with me, I may hope that we shall finish in the like accord. There are thinkers, many architects being of the number, who go so far as to advocate the placing of design and workmanship in the self-same hands. Some say that the designer by profession should, so far as possible, carry his design into execution; others think that none but the trained artisan ought to be entrusted with the design. The millennium may comprehend both or neither. My own suggestion on that particular head shall take the form of a question.

As artists, as men of business, as craftsmen, we are all in the same boat. This is one industry; there is only one craft of masonry and one of carpentry, and one of any other trade. Why should we not all learn them in the same school and at the same bench, at least so far as we have to travel together? The workmen would leave comparatively early in the journey, and the rest of us at stages which preference or necessity might dictate. But so far as we might journey together we should be learning the very same things. We should understand each other for the rest of our lives. And if one who might have started with lower ambitions should find his way into the higher grades of the industry, it is not the class to which I belong that would begrudge him the success which he has earned.

With these suggestions, and those on other

points which I have felt able to make, I commit this paper to your candid criticism.

Mr. Chatfield Clarke said he desired to propose a very hearty vote of thanks to Mr. Blashill for the valuable paper he had read to them. It was one of the most valuable papers that had been read before the Institution in recent years, and the members were especially indebted to Mr. Blashill for his breezy address, which, though long, seemed quite short in the reading. Mr. Blashill must have devoted many hours in the preparation for the paper, which dealt with one of the greatest problems of the century—viz., the labour problem. If the paper was to be considered as Mr. Blashill's diploma paper since elected to the council it was a brilliant example of what could be done in that direction. It was not the intention to discuss the paper that evening, and he therefore moved the adjournment of the debate.

Mr. Daniel Watney seconded the vote of thanks, and said he thought the paper would require a great deal of thought and attention before it could be adequately discussed.

The Chairman, on putting the resolution, said he thoroughly endorsed the remarks made by Mr. Chatfield Clarke as to the breezy and valuable character of the paper. Mr. Blashill's contribution to the science of political economy was especially valuable, and the point of view required discussion and elucidation.

The vote of thanks having been agreed to, it was announced that the discussion would be adjourned until that day fortnight.

The meeting then terminated.

ELY PLACE, HOLBORN.

An interesting site will shortly be cleared for re-building purposes. It is at present covered by certain freehold properties—Nos. 15-20, Ely-place and 1-13, Ely-mews, in the rear—yielding a total rental of 1,987*l.* per annum, which were erected in or about 1775 by C. Cole, as architect and builder, instead of, as had been proposed, a new Fleet Prison, upon ground that had vested in Lord Hatton's son-in-law, Daniel, Earl of Winchelsea and Nottingham.

The six houses in Ely-place and the mews stand on the ground formerly occupied by the garden on the north side of the chapel of Ely Place, the London "inn" of the Bishops of Ely. Bishop John de Kirkby, who died in 1290, bequeathed a messuage and ten cottages there, on ground rising from the right bank of the Fleet, to his successors in the See. William de Louth extended the lands, and in 1297 devised them to the See on condition that service should be maintained in St. Etheldreda's Chapel. John de Hotham (*obit* 1336) planted the vineyard, orchard, kitchen garden, &c., depicted in Aggas's map, and Thomas de Arundel, preferred to the See in 1374, reinstated the residence and the chapel, and built the Stone gatehouse in Holborn, where is now Holborn Viaduct.* We need not rehearse here the story of the occupancy of Ely Place by Sir Christopher Hatton, his nephew, and his nephew's widow, who, having married Sir Edward Coke, died there in 1616. The Bishops of Ely had made several attempts to recover their alienated property, but during Bishop Wren's long imprisonment in the Tower the greater part of the precincts were laid out for Hatton-garden, Hatton-wall, Bleeding Heart-yard, Saffron-hill, Vine, Kirby, Cross, Charles, and other streets. Bishops White, Wren, and Laney died at Ely Place. In Bishop Patrick's time, 1691-1707, a rent-charge of 100*l.* upon the Hatton estate was created in favour of the See, and a plot of ground in Hatton-garden was assigned to the See for a new chapel built by Christopher, Lord Hatton, which is now the St. Andrew's parochial schools, at the corner of Cross-street. Under an Act 12 George III., c. 43, the Crown acquired Ely Place for 6,500*l.*, with a further perpetual annuity of 200*l.* for the bishop, and in its stead built for the See a town house in Dover-street. All of the old Place, the chapel excepted, was pulled down shortly afterwards. St. Etheldreda's Chapel, having served in turn as a military prison and hospital (during the Commonwealth), a soldiers' canteen, beer and wine

* See Mr. H. W. Brewer's drawing, "A Monastic Suburb of Old London in the Sixteenth Century," *Builder*, January 7, 1898; A. Van Wyngaerde's view, circa 1550, in the Bodleian Library; and the bird's-eye view, 1572, in Braun and Hogenburg's "Civitates Orbis Terrarum." There are later views by J. Carter, Royce, and S. Hooper.

vaults, a schoolroom and offices for the National Society (1815), and a Welsh Episcopalian church (opened on December 10, 1843), was bought twenty-five years ago for 5,000l. by the Lazarist Fathers of Charity, and restored for purposes of divine worship by Mr. John Young, jun., and Mr. Bernard Whelan. In R. Godfrey's print, 1775, the chapel appears as roofless; in 1875 the removal of the slates in a line up to the ridge disclosed the ancient timber roof, after the simple style of the fourteenth century.

Its construction is that of a coupled-rafter roof. There is no ridge-piece, and no longitudinal tie except the two wall-plates and the external boarding. The rafters, averaging 8 in. by 6 in., laid flat-wise, are about 9 in. apart. There is a vertical strut framed into the inner wall-plate and the rafters, and above are cross-pieces and a collar, all about 8 in. by 4 in. All the pieces are united by double tenons, and secured with projecting wooden pegs. The material used appears to be chestnut wood (*Quercus castanea*) and is in good preservation.—*Builder*, April 24, 1875.

On the north side, which may be seen from the mews, was an entrance into the chapel and its crypt below; the upper doorway remains internally. The beautiful east window was filled in 1879 with stained glass, the Duke of Norfolk's gift, executed by Saunders & Co. after designs by Lonsdale and Mr. F. Weeks, and on St. Ethelreda's day, June 23 of that year, the chapel was rededicated and reopened by Cardinal Manning. On the chapel's south side towards Holborn stood the cloisters, the hall, coeval with the chapel, the colonnade, and the Mitre tavern, of which the sign yet exists. We may add that the Gothic screen and gallery at the west end of the chapel for the organ (by Lewis & Co.) were designed by Mr. Bentley, and that the west window is partly filled with stained glass, representing the martyrs, by Mr. John Hardman. Sir George G. Scott was of opinion that St. Ethelreda's Chapel was built in the period 1200-7. The indenture of conveyance, dated April 4, 1862, between the Bishop of Ely and the Church Estates Commissioners, which conveyed the St. Andrew's Schools in Hatton-garden to the surviving lessees, describes the school house (with a small burial-ground attached) as having been "intended for a church." The property we describe, in Ely-place, was sold on February 23 at the Auction Mart for 36,500l.

ARCHITECTURAL SOCIETIES.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association visited St. Oswald's Church and Bruntfield House on the 23rd ult. At the former they were received by the Rev. H. J. Wotherspoon, M.A., and were conducted over the building by Mr. Henry F. Kerr, A.R.I.B.A., President of the Association and architect for the church, the cost of which, including all furnishings and furniture, amounted to 7,481l. A cordial vote of thanks was accorded to Rev. Mr. Wotherspoon for kindly granting permission, and to Mr. Kerr for acting as leader. By permission of Sir George Warrender, Bart., Bruntfield House was next visited, Mr. J. T. Baillie acting as leader. Interesting mention was made of the various families who have successively owned the estate since Richard Broun, its first recorded owner. In viewing the mansion-house, the features of the plan and the exterior were dwelt upon, and appreciation was expressed of the fact that although additions have from time to time been made, the oldest part of the existing house still clearly displays the architectural characteristics of its period, and is still inhabited by its owners.

STONEHENGE.—The falling of the upright of one of the trilithons at Stonehenge is shortly to be investigated by a special committee which is being appointed for the purpose of considering the advisability of replacing in an upright position the stone that recently fell, as well as that which fell in 1798. The committee is to be composed of members selected from the Wilts Archeological Society, the Society of Antiquaries of London, the Society for the Protection of Ancient Monuments, joined by one or two local archaeologists. Sir Edmund Antrobus, the owner of Stonehenge and the surrounding downland, has appointed his own architect, who will superintend any works that are decided upon; but, fully appreciating the great archaeological interest and value of Stonehenge, Sir Edmund Antrobus is prepared, it is stated, to accept any scheme which the committee may suggest.

Illustrations.

WREXHAM CHURCH TOWER.

THE fine drawing of this celebrated tower was made by Mr. Harry Phibbs, and was one of the set of drawings, including several of great merit, which were submitted by him in competition for the Pugin Studentship of the Institute of Architects.

Wrexham Tower was built in the reign of Henry VII. Each succeeding stage of the tower is set back from the face of the one below, so that the parapet is on the inside line of the wall. The hexagonal turrets at the angles are of different heights, that on the north-west corner being the highest, and having a spiral stair right up to the top, where it ends abruptly.

The tower is now undergoing very necessary repair, the turrets and parapets having been restored in 1867.

The resemblance of Wrexham to the usual Somersetshire type of tower has been often remarked; it gives the idea of a Somersetshire tower which has strayed away from its proper county.

ST. ANNE'S CATHEDRAL AND PRESBYTERY, LEEDS.

IN consequence of a street improvement having been decided upon by the Leeds Corporation, it was necessary to acquire the site of the present cathedral, presbytery, and schools, and the whole of these buildings will have, therefore, to be pulled down and built elsewhere.

The site of the proposed cathedral and presbytery is adjoining the old one, with a frontage of about 119 ft. to Cookridge-street, 143 ft. to St. Anne-street, and 170 ft. to Great George-street, with about 75 ft. to a private road, so that it is almost on an isolated site.

The shape of the site, being very wide in comparison to its length, has involved a treatment of plan with a wide nave of 42 ft. and double side aisles, with all the altars at the east end. The principal entrances are at the west end.

The section of nave shows a flat, segmental pointed roof, with nave piers and arches carried up as high as possible, in order to give loftiness. The side aisles have also flat roofs over them, in order to get the utmost height for clearstory and aisle windows.

The choir and sanctuary, which is about 30 ft. wide by 50 ft. long, has an ambulatory all round, and there is a gallery over the latter for the organ and orchestra or additional choir. There are two turret staircases. The roof to this gallery runs through level with that of the nave, and is treated in a similar way.

The high altar will be treated simply with choice marbles, and will have a lofty baldachino over it, and a reredos of carved wood coloured and gilt.

The chapter house, which is approached from ambulatory, is octagonal in plan, and is situated at the east end of St. Anne-street; underneath will be a parish-room, about 40 ft. by 21 ft., entered by porches from St. Anne-street, and from the presbytery by a small turret staircase.

The reredos to the present high altar will be removed, and erected behind the altar in the Lady Chapel.

The two sacristies, which are placed in the George-street front, will be about 30 ft. by 20 ft. each, and are in connexion with the ambulatory and presbytery, the boys' sacristy having a separate entrance from George-street.

The presbytery is situated at the north-east end of the site, having a frontage of about 50 ft. to George-street and 75 ft. to the private road.

The first floor provides accommodation for the sitting-rooms and bedrooms of the canon and priest of the cathedral. The ground floor provides large dining-room, serving-room, and lift, reception-room, smoking-room, and parlour or waiting-room, with central hall, and staircase with large lantern light over it. The ground-floor level of the presbytery is almost level with the gallery over the ambulatory round the choir, so that this gallery can be easily entered from the presbytery staircase, and there is also an oriel window projecting into the sanctuary from a landing of this staircase, which affords a view over the whole interior of the cathedral.

The basement of the presbytery has a

kitchen, scullery, larder, beer, coal, and wine cellar, laundry, servants' sitting-room, &c. The windows of same to George-street are almost clear above level of ground.

The nave, aisles, Lady Chapel, and transept will seat 850 persons, and the choir 50, exclusive of canons' stalls.

The materials of construction are as follows:—

The external walls of the cathedral are to be faced with Weldon stone and Ketton stone for dressings, and for tracery, carvings, mouldings, &c.

The internal finish will be of Corsham Down stone.

The wide 42-ft. span of nave roof has principals of latticed steel ribs, and the roofs are covered with Delabole slating.

The external walls of the presbytery are to be faced with sand-faced Suffolk bricks, and Ketton stone in the porch, pilasters, strings, niches, copings, &c.

The floor of the nave and aisles is to be of wood-block flooring with terrazzo paving to the aisles. The paving of the sanctuary and choir will be of marble.

The cost of the whole, including heating, seating, organ rebuilding, &c., will be about 36,000l.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

THE ROYAL SCHOOL OF ART NEEDLEWORK.

THE old building of this school has been for some years inadequate in many ways for the excellent work produced there, and recent developments necessitated the erection of the new building visited by the Association on their second spring visit on the 2nd inst. Although the site chosen at the corner of the Exhibition-road and the Institute-road is ideal from several points of view, the close proximity of the Imperial Institute and the Technical Training College has rendered the task of the architect, Mr. F. B. Wade, a problem of striking contrast to either building.

The new school, which is approaching the finishing stages, is a three-storied building mainly carried up in Portland stone, with the exception of the wall surfaces of the main floor, which are in red brickwork. The rectangular plan is arranged with an open court above the semi-basement.

Two large apartments extending the whole length of the south front are for the display of finished work, and these form the most prominent features of the scheme.

The whole of the semi-basement is planned for work and lecture rooms, and, together with the back wings of the main building, a large amount of accommodation is provided for extending the various classes and lectures so essential for the proper working of the school.

It is to be regretted that at the present time it is not proposed to complete the outside carving. In a building of this description "blocks left for carving" would suggest a plea for poverty, unfortunately too frequently met with. There is always a danger when scaffolding is once removed from a new work that this disfigurement of incompleteness is for an indefinite period.

Miss Wade, the manageress of the school, conducted the members over the old building and gave them interesting descriptions of the work carried on. The various designs for tapestry and decorative panels were of great interest and demonstrated the excellence of the education to be obtained at the classes.

Mr. Wade personally explained the drawings of the new building, and the thanks of the Association are due to him for an interesting visit.

DIRECTORY OF TELEGRAPHIC ADDRESSES.—We have received from Mr. Henry Sell, of Fleet-street, a copy of "Sell's Directory of Registered Telegraphic Addresses" for 1901, which has been compiled from official lists, and which contains all the information received from the Post Office to January 1. As we have previously remarked, the directory is a very reliable one, and includes an exhaustive list of London and provincial telegraphic addresses, alphabetically arranged—in the first section under the names of firms and in the second section under the telegraphic address, with number showing the page on which the name and address of a firm appears. The directory also gives the telephone number of various firms. A new feature of the 1901 edition is a list of our Consuls in foreign countries, classified under the towns in which they are resident. With the volume is issued a map of South Africa in colours.

THE CHURCH CRAFTS LEAGUE.

A MEETING of members of this society was held on the 28th ult. at the Vale Studio, King's-road, Chelsea, S.W., when the President, the Bishop of Rochester, occupied the chair. The subject down for discussion was "The Present Disuse of Art in the Church—its Reasons and Results," and the chairman called on Dr. Biggs to read a paper on the subject.

Dr. Biggs prefaced his remarks by calling attention to the attempts which the church had made towards art in the latter part of the nineteenth century, as instanced in such buildings as All Saints, Margaret-street, Keble College Chapel, and several others. He also dealt with some of the difficulties which clergy and committees had to meet in dealing with artists. In his opinion greater accuracy of detail was wanted in the artistic treatment of biblical scenes and subjects. Many people visited Palestine now, and these travellers were often disappointed because the actual country was so unlike any representations of it they had seen in their churches. At the same time he appealed to artists to treat sacred subjects in the traditional manner which had been laid down by the church, and which distinguished sacred art from secular.

Mr. Lionel Cust, the next speaker, referred at length to the historical view of the subject, pointing out the causes which led to the practical abolition of art in our churches at the time of the Reformation.

Mr. Selwyn Image disagreed with Dr. Biggs as to the distinction between sacred and secular art. Art was a man's self, and his individuality must impress itself on everything that he did. In work intended for a church the artist confined himself to certain subjects, and in work intended for a drawing-room he dealt with other subjects, but beyond this there could be no further distinction between sacred and secular art. He reminded the meeting that in days when Gothic churches were built, people also built Gothic houses. Every artist had an individuality, and each age had a style. Therefore, if any person or firm offered to do work in any style required, it might be taken for granted that the work would be bad. Although we lived in an age which (for many social and economic reasons) had no style, yet every artist had an individuality which must impress itself on everything he did.

After an interesting discussion, in which Canon Armitage Robinson, Mr. H. Wilson, Mr. John P. Seddon, Mr. W. S. Frith, and Mr. T. Stirling Lee took part, the Bishop of Rochester expressed his appreciation and thankfulness for the remarks which had fallen from the clergy and the artists present. The two professions had much in common, and the Church Crafts League would justify its existence if it only called together such meetings as the one they were having that evening. The subject they had been dealing with was of tremendous importance, and he hoped soon to have another opportunity of hearing the subject discussed.

The next general meeting of the League will be held early in May. Any non-members caring to attend will be welcome. Tickets can be had from the Secretary of the League, at the Church House, Westminster, S.W.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution held at the Westminster Palace Hotel on March 1, the Chairman, Mr. Percival Marshall, presiding, a paper was read on "Carburetted Water Gas" by Mr. S. Cutler, jun., M.I.Mech.E. After reviewing the progress of the carburetted gas industry since its introduction into this country in 1891, the author proceeded to indicate a few reasons why the system had been adopted as an auxiliary plant in conjunction with coal gas apparatus for the production of illuminating gas, the principal being the prevailing scarcity of canal, which had been extensively used as an enricher to increase the illuminating power of the gas obtained from common coal to a degree prescribed by the statutory standard. The importation of cheap carburetted oils rendered the process of carburetted water gas an economical one, and many plants were installed. It was soon found the system was possessed of several advantages, which led to its fairly extensive use. The principal features of the plant were the independence of labour, rapidity of production,

utilisation of a large portion of a bye product of the coal, viz., coke, assistance in the prevention of naphthalene deposits, smaller capital cost, and reduced area for accommodation of the apparatus. It was not surprising that engineers in the United States, where there are vast oil supplies, should be the first to evolve a practical plant, and of the many types tried, the "Lowe" apparatus had met with most favour, and formed the basis of most of the present day plants. With the aid of diagrams the method of manufacture was then described, the complete apparatus necessary for the production and purification of the carburetted water gas being illustrated. The manner in which the raw gas-making materials—water, carbon, and petroleum—became transformed into the finished illuminating gas was traced from stage to stage, and the chemical reactions occurring in the generator and analysis showing the various changes in the composition of the gas in the course of its passage through the different vessels of the plant, were included on a sectional diagram of the generating portion of the apparatus. Special reference was made to the constituents, carbon monoxide and carbon dioxide. In the year 1897, at which time twenty companies and eleven corporations had installed plants at their works, the Home Office instituted an inquiry as to the unlimited use of a gas containing 30 per cent. of carbon monoxide on account of its well-known toxic properties. The result was a recommendation for restricted use, but at present no legal limit had been enforced. English gas companies, however, did not desire to, or rarely did, exceed a limit of more than 30 to 40 per cent. of water gas in their total production. In America, on the other hand, over 70 per cent. of the total gas consumed was pure carburetted water gas. Various details of the plant were next considered, including the method of dealing with the effluents from the washers and the separation of tar, a process attended with some difficulty, owing to the slight differences in the specific gravities of the liquids. A safety gear, a model of which was exhibited, was described. By means of this gear the operator was enabled to perform in proper sequence the various changes of valves from "run" to "blow," and *vice versa*. The question of oil was next entered into, and it was pointed out that as the cost of this ingredient formed over 60 per cent. of the total cost of the gas, it was of great importance to obtain from it the highest possible duty. The author, in conclusion, referred to the present position of carburetted water gas in relation to the coal industry. The enhanced prices of oil had restricted somewhat the use of the system as a means of producing the gas as economically as coal gas was obtained; the value of the process was, therefore, exemplified more in collateral advantages. That companies and municipal corporations were still adopting and extending the process indicated that the benefits to be derived from its introduction were unmistakably definite.—A discussion ensued, and a vote of thanks having been accorded the author, the proceedings closed with the announcement of a visit, arranged in connexion with the paper, to take place on March 9, when the Southall station of the Brentford Gas Company would be open for inspection, including the plant for the manufacture of carburetted water gas.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on the 4th inst., Mr. Charles Mason, President, in the chair, a paper was read on "Notes on Certain Details of Drainage Construction," by Mr. Gerard J. G. Jensen. The author, at the outset, pointed out the desirability of giving attention to the merest details in drainage construction, and he then proceeded to discuss certain matters which up to the present have been misunderstood or neglected. Amongst these, none, he thought, claimed greater attention than the construction and arrangement of ventilation pipes. He drew attention to the reprehensible practice of constructing ventilation pipes of iron, as they were invariably found to rust in the interior, thereby not only deteriorating and making renewal necessary, but also becoming blocked and thereby rendering insanitary that which might otherwise be a good system of drainage. This latter, he pointed out, was especially serious in view of the fact that the householders who have their drains periodically inspected are still in the minority. Amongst other details of construc-

tion pertaining to ventilation pipes, he further brought under notice the still inexact knowledge regarding the action of drain air upon the human constitution. Pending a more complete knowledge on the subject, he urged the necessity of erring upon the safe side in choosing positions for liberating drain air through ventilation pipes. As tending to prove the evil effects which might ensue from neglect on this point, he instanced the case of a large school in which he had traced the cause of various outbreaks of follicular tonsillitis to the faulty arrangement of ventilation pipes, which in most cases were placed near the dormitory windows. The wards of a recently-erected sanatorium at the same school, he stated, were under similar influence, and though it still remained to be seen whether any evil results would ensue, he regretted that those about to be experimented upon were not guinea-pigs, nor rats, but human beings. Continuing, the author touched upon the still frequent practice of providing waste-pipes with hopper heads at the points at which branches from fittings within the house join the main pipe. He could imagine no more insanitary and offence-giving construction, and thought that the fullest measure of the evils of the system was perhaps experienced under the, at present, fashionable flat life. An alternative and more satisfactory system of arranging and constructing waste-pipes was described, as were also the most efficient methods of arranging their discharge into surface traps. Some observations on manholes and drain joints followed, the paper concluding with some remarks on overflow pipes from lavatory basins, baths, and sinks. The author considered that too little attention is, as a rule, bestowed upon these details, and suggests that the musty smells in bath-rooms and similar apartments might frequently be ascribed to faulty overflows. The continued manufacture and use of uncleanly overflow-pipes, he thought, must be one of the wonders of house drainage, since their evils must be patent to all. The paper was illustrated by a number of diagrams.

COMPETITIONS.

HULL ROYAL INFIRMARY EXTENSIONS.—The assessors in this Competition have just made their award on the designs submitted in competition. The first premium has been awarded to No. 3, submitted by Messrs. Worthington & Sons, Manchester, and the second premium to design No. 4, submitted by Mr. T. Percy Adams, 28, Woburn-place, London.

ST. MATTHIAS SCHOOLS, SALFORD.—The Improvement Committee of the Salford Corporation received a number of plans in answer to their advertisement inviting competitive designs for the erection of the new St. Matthias Schools. The plans were referred to the assessor, Mr. Royle, of Messrs. Royle & Bennett, architects, Manchester, to choose out of the number of plans sent in (viz., seventy-two) not more than ten as designs for the consideration of the Committee. A sub-committee carefully examined these plans, with the assistance of the Clerk to the Salford School Board, and eventually made the following awards:—(1st) Plan No. 59; (2nd) Plan No. 29; (3rd) Plan No. 22. The corresponding envelopes containing the names of the competing architects were thereupon opened, and it was found that the successful architects are:—Plan 59, Mr. Benjamin Bower (Birmingham); Plan 29, Messrs. Woodhouse & Willoughby (Manchester); Plan 22, Mr. Alfred H. Mills (Manchester). The plans which have been received will be on view at the Town Hall on the 12th and 13th insts.

PUBLIC SHELTER, FLEETWOOD, LANCs.—The design placed first in the competition for public shelter, with pleasure grounds, Fleetwood, Lancs, is by Mr. H. A. Luke, R.E. Office, Curragh Camp, co. Kildare, Ireland.

NEW HEAD OFFICES FOR NORWICH UNION LIFE INSURANCE.—In a limited competition for new buildings at Norwich for the above-named insurance company, the design of Messrs. G. J. and F. W. Skipper, of Norwich, has been placed first, and that by Mr. A. R. Mayston, of London, second.

PROPOSED ADDITIONS TO ST. PETER'S CHURCH, EASTBOURNE.—It is proposed to build a new choir vestry and practice-room at St. Peter's Church, Eastbourne. Mr. C. W. Tomes, of Eastbourne, has prepared the plans.

Books.

The Mechanical Triumphs of the Ancient Egyptians. By Commander F. M. BARBER, United States Navy (retired). London: Kegan Paul & Co. 1900.

THE author of this small book has endeavoured to sum up the evidence and the probabilities in regard to the manner in which the Egyptians moved and raised their immense colossi, and finished the outer casing of the pyramids; the latter operation being, as he says, the real problem in regard to the pyramids, as the mere piling up of material without any outside finish was, with unlimited compulsory labour, only a matter of time. As far as the question of the use and capabilities of tackle of any kind are concerned, a naval officer has some special qualifications for treating the subject, from his professional experience in the use of ropes and hoisting tackle; and Captain Barber's observations on the ancient Egyptian representations of boats and the way they are rigged, and on the way the obelisks appear to have been secured on the boats, are of considerable interest. Whether he brings us any nearer solving the question as to the *modus operandi* of finishing the pyramids is doubtful; in fact, his views seem rather contradictory. He assumes that the Egyptians were a very scientific people, yet he points out that they seem to have had no means of moving a colossal statue from the place where it was made to its ultimate destination except by the sheer pull of hundreds of men. He remarks that the use of men instead of animals for such labour was probably because they could be trained to pull by repeated efforts at a word of command in a way that animals could not; which is a point we have not seen remarked on before in connexion with this subject. But in regard to the pyramids he falls back on the idea of an immense inclined plane of earth collected and built up, with a longer and longer slope as the pyramid rose higher; up which slope the stones were hauled by the sheer pull of hundreds of men, as with the transport of the colossi along the level. The objection as to the immense amount of material which must have been piled for such a purpose, only to be removed again, he considers to be met again by the consideration of the unlimited unpaid labour which was at the command of the Egyptian rulers; this is an answer, of course, but it is surely incompatible with the idea of the Egyptians being a scientific people; it is about as bungling and round-about a method as could be imagined.

It is curious that the numerous representations of men at work, in Egyptian paintings, show nothing of such tackle as would have been necessary in order to raise the finishing courses of the pyramids to their places. But we may take it for granted that where there is the general and free use of ropes, of which, in the case of the Egyptians, we have ample evidence, there will be the knowledge and use of the pulley; and the description by Herodotus of the manner in which he was informed that the stones were raised is quite according to reason and common sense as far as it goes, and only presupposes the idea of ropes, pulleys, and a swinging arm or else a simple form of traveller:—

"The pyramid was built in steps, battlement-wise, as it is called, or, according to others, altar-wise. After laying the stones for the base, they raised the remaining stones to their places by means of machines formed of short wooden planks. The first machine raised them from the ground to the top of the first step. On this there was another machine, which received the stone upon its arrival, and conveyed it to the second step, whence a third machine advanced it still higher. Either they had as many machines as there were steps in the pyramid, or possibly they had but a single machine, which being easily moved, was transferred from tier to tier as the stone rose.—Both accounts are given, and therefore I mention both. The upper portion of the pyramid was finished first, then the middle, and finally the part which was lowest and nearest the ground."

(Herodotus: Rawlinson's translation.)

The last sentence is thoroughly practical; the pyramid being first built so as to leave a succession of steps on the face, the final casing, which would fill in and obliterate the steps, would naturally be commenced at the top, the lower steps serving as stages for raising the blocks to the courses above them.

Although the visit of Herodotus to Egypt

was so long posterior to the erection of the Great Pyramids, it is reasonable to suppose that the correct tradition still remained as to the manner in which they had been built, in a land where all things were so slow to change; and certainly the idea which he suggests as to the *modus operandi* is far more reasonable and probable than the inclined plane theory which Captain Barber has endeavoured to revive, and which would leave us to suppose that the Egyptians were deficient in all but the most primitive methods of construction, worthy only of a barbarous people.

The Architectural History of the Cathedral Church and Monastery of St. Andrew at Rochester. By W. H. ST. JOHN HOPE, M.A. London: Mitchell & Hughes.

ARCHITECTURAL descriptions of minsters and monasteries by Mr. St. John Hope are always worthy of attention, and the evidences with regard to buildings from chartularies or other documents are always reliable. This monograph on Rochester, to a considerable extent a republication of previous papers, fully sustains his reputation for accuracy and clear judgment.

The series of plans are invaluable adjuncts to the letterpress, and are made most explicit through their careful colouring. The first one is a conjectural plan of Gundulf's work (1077-1090) showing the existing remains, which are chiefly on the south side of the nave. The Early Norman work (1095-1100) is carefully distinguished. The foundations of the Early Saxon church of 604 are also shown at the west end. The second plan gives the whole of the minster as it now stands, and is of a most elaborate, but, at the same time, clear character. It brings before us at a glance no fewer than twelve different periods—Early Norman, Later Norman, repairs after fire of 1170, new choir of William of Hoo (1227), contemporary work in choir aisles, north transept (1240-1255), south transept from 1280, alterations from 1300, insertions c. 1340 and later, fifteenth century works, and post-Suppression and modern.

The third plan deals with the crypt, and here we are able to distinguish between seven different dates, according to Mr. Hope's deductions from observation and evidence.

The fourth plan deals with Rochester Priory, giving a plan of the precinct based on the Ordnance Survey. The mediæval remains are coloured red, and it is interesting to note that they are far more considerable than is usually supposed.

The last plan is also of Rochester Priory, but is confined to the church and monastic buildings. By an ingenious arrangement, the choir and presbytery in this plan can be raised, showing the intricate crypt arrangement immediately below. It reminds one of the exciting surprises in some of the superior toy-books of one's childhood.

Mr. Hope gives his reason for assuming that the foundations at the west front, which were discovered in 1888, and which contained a good deal of Roman material, are the remains of the church built by Æthelbert in 604. Its measurements are almost identical with the small church of St. Pancras, at Canterbury, and harmonise with two other early Kent churches—St. Martin's, at Canterbury, and the foundations of Æthelburga's church at Lyninge. All these have been personally planned by Mr. Hope.

The account of the monastery is of particular value, for it represents the careful investigation and planning which Mr. Hope undertook in the "eighties" when resident at Rochester for four years. He had also the run of the muniment room, and was fortunate in lighting upon sundry useful pieces of information. The buildings of the Benedictine priory attached to the Cathedral church of Rochester occupied a most unusual position, for they were erected on the south side of the presbytery, instead of being north or south of the nave. This had an important effect on the disposition of the claustral buildings.

In addition to the plans, which are Mr. Hope's own work, there are a variety of illustrations specially drawn by Mr. Roland W. Paul, whilst others have been lent by Messrs. Murray and Messrs. Parker & Co. Several of the new ones by Mr. Paul cannot fail to be of service to architects as well as of interest to the general reader. A slip inserted by Messrs. Mitchell & Hughes mentions that there are only 200 copies of this monograph for sale.

We shall be surprised if they remain long in the market.

The Churches of Rouen. By the Rev. THOMAS PERRINS, M.A., F.R.A.S. London: George Bell & Sons, 1900.

"ROUEN" is certainly one of the best of Messrs. Bell's handbooks. The cathedral and the churches of St. Ouen and St. Maclou present, it is true, so much interest that it should be a difficult matter for an author to fail in making a small book on such subjects a readable one. Nevertheless, the characteristics of these churches are so various, their architecture is representative of so many periods, that to attempt to treat of them without a generous catholicity of opinion would have resulted in the production of a handbook so negative in its tendency as to leave but little that was beneficial or helpful to the reader anxious to admire. Mr. Perkins wisely, as we think, finds something to praise in that period of French architecture which may almost be said to be a renaissance of former styles rather than a style itself. We have nothing that corresponds to it in English mediæval work. Our Perpendicular style developed beneath the steady process of evolution. In France the architects of the closing fifteenth century and of the sixteenth arranged a theme with variations based upon the features of styles gone by.

Thus, to any one seeking such inspiration as originality gives, much of the detail composing the cathedral must strike him as disappointing. If, however, he will but abate his rigour and regard the whole as something that is wonderfully picturesque, he cannot be otherwise than well satisfied. If he desires refinement he will find it at St. Ouen; indeed, he may possibly find too much. To those who regard the *finale* of Gothic architecture as an attempt to reduce all points of support to the lowest terms, St. Ouen will stand as a revelation. Yet it may reasonably be questioned whether, in its endeavour to secure grace, it has not sacrificed that architectural birthright—the evidence of stability.

The book is furnished with many good photographs, which simplify, and increase the value of, the text. These have been taken by the author himself, who has been thereby enabled to select those points of view best suited to his remarks. The preface acknowledges a debt due to the courteous sacristan of St. Ouen, M. Edouard Julien. We also have a lively recollection of Edouard; indeed, he and the church over whose safety he presides are inseparable in our mind. Hitherto he has been satisfied to quote the opinions of Mr. Ruskin; we hope that he may now add those of Mr. Perkins.

We may remind our readers that a fine drawing by Mr. Brewer of the spires and towers of Rouen amid their picturesque surroundings appeared in our New Year's issue. The city has already suffered much by the exigencies of modern improvement, and is likely to suffer still more. Such a record is therefore particularly valuable.

Old Cottages and Farmhouses in Kent and Sussex. Illustrated in 100 Plates printed in Collotype from a Special Series of Photographs taken by W. GALSWORDTHY DAVIE, with some Descriptive Notes and Sketches by E. GUY DAWBER, Architect. London: B. T. Batsford, 1900.

ANY work on the domestic architecture of England is always welcome; the subject is one of inexhaustible interest in itself, and to students of architecture is associated with the pleasantest of their duties—that of wandering, sketch-book in hand, from village to village, wherever and whenever opportunity permits. The present work is confined to the illustration and analysis of the smaller and more homely architecture of the villages of Kent and Sussex.

Mr. Dawber points out that the architecture of the larger houses, which has been the subject of so much research, is a subject apart, owing, as it does, much to foreign influence and workmen. The English tradition is clearly defined in the country cottages and yeoman's houses, where every noticeable change in appearance is one of adaptation to requirements; in Mr. Dawber's words, "They never pretend to be anything but what they are, and there seems to be no effort in either their construction or ornamentation, but merely a simple handing on from generation to generation of well worn

and tried tradition." The notes and sketch diagrams illustrating the photographic plates, emphasise the all-important details which compose the little architectural harmonies, and will help the student to study old work in the most advantageous way. For to be able to indicate the elements that make the charm of the old work in a clear and sympathetic manner is a step towards good design in modern cottages and small houses, where all agree that the work of the past is worthy of emulation. The first point attention is drawn to, is the distinctive character given to districts by their geological formation. Thus in Sussex the buildings were mostly built of timber, until the iron industry, once so prosperous in this now agricultural county, destroyed its forests for use in smelting the iron ore. The appearance of these timber-framed houses is different in character to those of the timber building counties of Shropshire and Lancashire. Mr. Davber merely points out that they are less elaborate and more purely constructional; we suppose the reason for this is partly due to the larger houses in the south being built of stone or brick, whereas in the north they were very often entirely of timber, and are besides of a later date. Among other features that influenced the design of these smaller houses, attention is drawn to the fine breadth of feeling and proportion that the old builders attained in their chimneys, a feature much neglected in modern cottages; and also to the roof, with its broad expanse of hatch or tiles, that gives such a sense of sheltering protection to the houses. The quiet plaster fronts are more frequently found in Kent than in Sussex, in which county flint and link diaper are also used with picturesque effect. The book, with its 100 well-chosen photographic plates, is a valuable record of these counties presented in a very attractive form.

A Short History of Renaissance Architecture in England, 1500-1800. By REGINALD BLOMFIELD, M.A. George Bell & Sons, London, 1900.

IN our issues of April 16 and 23, 1898, we reviewed this important work in detail. The present edition is a somewhat abridged form of the same work in a small single volume forming a handbook of the subject. A valuable addition is a plate of the five orders of Palladio, taken from Freart's "Parallel." Considering the great technical importance of the orders in the architecture of the seventeenth and eighteenth centuries, the student of the Renaissance cannot have these models too firmly impressed upon his memory. The omissions in the smaller work are amongst the illustrations, which are reduced to the most important examples connected with each stage and cause of the historical development of the Renaissance; and also those parts of the original text dealing with architectural treatises and literature.

Laxton's Builder's Price-Book for 1901. Originally Compiled by WILLIAM LAXTON. Eighth-fourth Edition. London: Kelly's Directories, Limited.

ONE cannot study this latest volume and compare it with one of the earlier ones without being struck by the great improvement in the matter and form, and especially in regard to the prime object of the work, *i.e.*, the prices. The time has now passed for the surveyor, when dealing with the builder, sarcastically to suggest that "perhaps he would like Laxton's prices." Possibly this may be due to the healthy competition of that other now recognised price-book, "Lockwood," noticed below. Be that as it may, the effect is, that the Laxton of the present day so far exceeds in usefulness the earlier editions, that, if there is a use for a price-book, one wonders to what extent these earlier editions answered their purpose.

We are pleased to see that the carpenter's prices have been revised throughout, but generally there has been little need for revision. There are still some unfortunate anomalies which it would be well to eliminate. Really it is about time that pages 274-5 were rewritten, and steel given its due as a constructive material. How many architects, we wonder, now specify rolled iron joists; and even this list is given without weights.

Taking all things into consideration, however, "Laxton" will doubtless still find a place

upon the shelves as the father of the other works of the same nature, and deservedly so.

Lockwood's Builder's and Contractor's Price-Book for 1901. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. London: Crosby Lockwood & Son, 1901.

THE prices for building work having remained almost stationary for the past twelve months, with the exception of one or two branches, the work of the reviser of price-books has been somewhat light. Light as this work has been, the editor has hardly done all he could in this direction, no note having been taken of the continued rise in timber, which has reached a price almost unprecedented. Almost the only reduction during the year—and that during the later months—was in steel constructional work. The prices quoted are rather high, but the reduction is so uncertain that possibly there is an excuse for no note being taken of this. The heading given is merely "Wrought Steel," but certainly something should be said as to whether of English or foreign manufacture. The prices would indicate that "English" is referred to.

There is the usual mass of general information—legal and otherwise—and tables, which all tend to make the work useful in other directions than those for which it is specially designed.

The production of this work of late years has been so much improved as to make it a formidable competitor with its much older companion, "Laxton," which for so long held its position as a standard work—a healthy competition, nevertheless, of which the users of a price-book reap the advantage.

A Practical Treatise upon Steam-Heating. By FREDERICK DYE, M.R.I. London: E. & F. N. Spon, Limited. 1901. 238 pp.

IN his preface Mr. Dye draws attention to the want of an English book on the subject of heating buildings by steam, and considers that this is one reason why steam-heating has not been more generally adopted in this country. In factories with steam-power, steam has, of course, been largely used for heating for a great many years, but installations in other buildings have not been so entirely successful as to encourage architects to prefer steam to hot water. The principal objections to steam are the noises in the pipes—often so loud as to terrify timid people—the difficulty of regulating the heat, and the rapidity with which the pipes cool. The last objection loses its force in the case of buildings which are occupied only for short periods, such as places of worship, concert-rooms, and theatres, and neither of the other objections is insurmountable, as Mr. Dye's book shows. Steam-heating has, however, been adopted in this country to a greater extent than Mr. Dye seems aware of; English architects and engineers are not all unacquainted with American books on the subject, such as Baldwin's "Steam-Heating for Buildings," the writer's copy of which (dated 1895) bears the legend, "Thirteenth Edition," and the subject has not been entirely neglected by English writers. Mr. Dye's book, however, is a valuable addition to the literature concerning steam-heating, and can be recommended as a trustworthy source of information. The author writes without bias, pointing out the defects as well as the advantages of the system, and giving particulars of every part of the apparatus. The chapter on boilers is somewhat inadequate, but with this exception the different kinds of low-pressure and high-pressure apparatus are fully described. The expression, "much data is available" (p. 117), must be corrected in the next edition, and also the statement, on p. 137, that in buildings heated with low-pressure steam "the air . . . undergoes no perceptible change in dryness."

The book is well illustrated, and contains a large amount of information which cannot fail to be of service to architects and engineers, as steam is undoubtedly a valuable heating agent for certain classes of building.

Exercises in Graphic Statics: with Examples of its Application to Practical Designing of Constructional Ironwork. By G. F. CHARNOCK, A.M.Inst.C.E. Part II. Manchester: J. Halden & Co. 1900.

THE second part of Mr. Charnock's exposition of graphics is chiefly devoted to a consideration

of beams and girders. Altogether, there are fifty-two sheets of diagrams, with explanatory letterpress; a few of the diagrams relating to work coming under the especial province of the civil engineer, but the greater part of the work is of particular interest to the architect and the builder. Of course, it is to be understood that the volume is addressed to students, yet its contents should prove of great assistance to those who wish to ascertain for themselves the actual value of beams or stanchions for some particular purpose. It is not infrequently the case that the essential factors for a given calculation are not to be found ready made in the ordinary book of tables. A knowledge of the methods which are so ably expounded by the author would at once remove the difficulty thereby experienced. Dealing with simple and compound beams of various types, the use of rolled joists as stanchions, the design of steelwork in floors and roofs, and the forms and proportions of riveted joints, this set of diagrams is one of much intrinsic value.

TRADE CATALOGUES.

THE Gohsen Manufacturing Company, of Canton, Ohio, U.S.A., has sent us a pamphlet on "The Preservation of Wood, Steel, and Galvanised Surfaces." This company manufactures all the common varieties of paint, but makes a speciality of the manufacture of a paint termed "carbonising coating," which, it is claimed, will protect exposed iron and steel from corrosion for a period of from ten to fifteen years, and which, owing to its remarkable covering capacity, is the most economical protective paint on the market. It is well known, says the pamphlet, that the steel as manufactured in structural shapes of to-day is a much harder body to protect from rust than the iron used years ago, and consequently requires special care in the matter of paint. The use of red lead is deprecated, as the red lead "dries too rapidly and hard (at the expense of the oil), becoming brittle, and does not allow for the expansion and contraction of the metal." In the chapter on "Mistaken Expert Testimony on Red Lead" we are told that "many of the trade booklets which find their way into the hands of the engineer and structural builder, calculating, as they do, to foist some special brand of paint as being the most permanent paint for iron and steel, contain theories, assertions, and ideas which, to a careful reader, do not accord with the laws of Nature, chemistry, or practical demonstration. These false theories emanate from a want of knowledge, misunderstanding, or in an attempt at nullifying all other coatings save the one which they are desirous of selling." We agree; and although the booklet before us strongly advocates the use of a certain paint, of a composition not quoted, which is manufactured only by the Gohsen Manufacturing Company, and contains statements and theories which will not pass unchallenged, it is by no means devoid of information which may be of practical utility to those who have to select paint for various purposes.

Messrs. Lockerbie & Wilkinson send us a finely got-up catalogue of locks, brass foundry, ironmongery, &c. The illustrations are all by photographs from the original objects. The mortice lock furniture shows a variety of designs mostly in very good style, both in wood and metal. Large sized photographs of the interiors of the locks are given, so that their construction can be studied almost as from examination of the originals. The weighted mortice lock, in which the return of the latch to its position is actuated by a weight instead of a spring, is particularly worthy of attention. The catalogue includes also rim locks, rim night latches, stock locks, light weighted mortice locks and lock handles, lock and finger plates in brass and in beaten copper, electric pushes, and casement handles, the latter very effective in regard both to appearance and action. Front door furniture, sash fasteners and axle pulleys are also included, and beaten copper or brass cabinet fittings. Attention should also be given to the ball-bearing runners for sliding doors, various forms of which are illustrated and described in the catalogue. Among the contents of the catalogue are also a variety of fan-light openers, among which is the "Lockerbie" rod opener for working a vertical series of fanlights, and the "Victoria" gearing for opening horizontal and vertical series of lights. The decorative grate designs in beaten copper and in inlaid

wood are admirable, and quite above the average style of design seen in catalogues.

Messrs. J. Hodson & Son (Nottingham) send us a pamphlet in recommendation of Killer's Hopton Wood Stone, in which they deal, containing photographs of various buildings carried out by them in this stone, a beautiful material, which has been used in various important buildings in this country. The following particulars given in the pamphlet may be of interest:—

"The quarries produce three qualities of stone known as the white bed, grey bed, and dark bed. The white bed is used for monumental purposes. The grey bed is used for best finished and polished work, and has been used in the buildings mentioned in the list; it will take a polish equal to marble or granite, and can be supplied at less cost than either; it is suitable for exterior or interior use, and can be seen with good effect in the Imperial Institute and other buildings. The dark bed is the hardest, and is now put on the market for all descriptions of general masonry requiring a hard and durable stone, giving a clean, impervious surface; the crushing stress, as tested by Messrs. Kirkaldy, is 810 tons per cubic foot."

Messrs. Ham, Baker, & Co. send us illustrations and descriptions of their patent water waste preventer for street fountains or pillars, which enables any required quantity of water to be drawn, but prevents the possibility of the water being left running. The apparatus consists of a tap connected to a cylinder, holding a known quantity (say one gallon). When the handle of the tap is turned the contents of the cylinder are discharged through the outlet of the tap. The water then stops automatically, and no more will flow until the handle of the tap is reversed, when a similar quantity is drawn, again stopping automatically, this quantity being the maximum obtainable with one turn of the handle. The principle on which it works is shown in the accompanying diagram. Water from the main

which their material has been employed—a form of illustration which is not very much to the point. At the end of the book, however, are some sections showing the application of the material, and especially drawing attention to the saving of room in the upper portion of a house owing to the capability of the material (alternating with asphalt) being laid as a flat roof instead of with the slope necessary for tiles or slate. The vulcanite roof has, we believe, stood very strong tests in regard to fire-resisting quality.

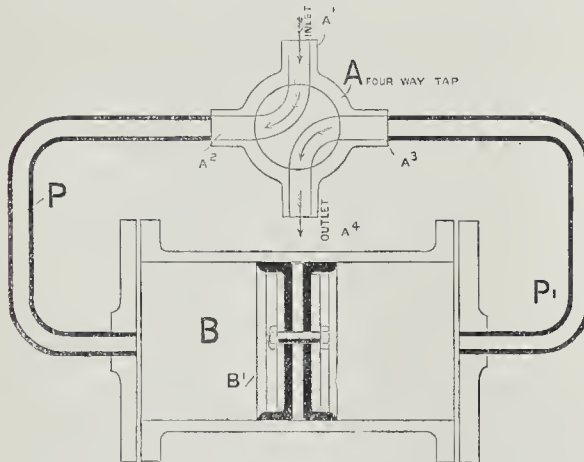
Messrs. Colledge & Bridgen (Wolverhampton) send us an illustration and description of their "New Century" patent case-stay, of



which we append an illustration. The object, in the words of the patentees, is "to dispense with the weak double joint."

Messrs. Neatby Evans & Co., a new firm of decorative artists in Percy-street, W., send us a pamphlet circular in true "up-to-date" style, printed on grocers' wrapping-paper with uncut edges, with illustrations in thick lines and little blots of colour. We should surmise from what we gather from the illustrations that their work will probably have a good deal of character—the sketch for a clock for instance is very original—and we may have more to say about their work on another occasion; but we regard this kind of make-up of a catalogue as a mere artistic pose, a fashion of the moment, in which there is no merit but eccentricity.

Mrs. Starkie Gardner sends a pamphlet describing and illustrating some works in metal made by her. These include a special lever lock of which the section is given; and some examples of decorative metal-work; hand-beaten work, of which the same design is not repeated,



Messrs. Ham, Baker, & Co.'s Patent Water-waste Preventer for Street Fountains, &c.

enters at A 1, flows through the port in the plug tap A to pipe P into the cylinder B, forcing piston B 1 to the opposite end of the cylinder, and at the same time expelling the contents of this cylinder through pipe P 1 to the outlet of plug tap A 4. When the piston B 1 arrives at the end of its travel the water ceases to flow.

Messrs. Davenport & Coward, constructional engineers, send us a leaflet containing illustrations of some of their special forms of fire-resisting construction. These include a good form of suspended ceiling, in which ceiling bars, protected by concrete, are suspended by a special form of clip to the flanges of the main rolled-iron girders. They also show concrete floors without joists for spans up to 12 ft. of concrete with a "tension bond" embedded. Messrs. Davenport & Coward are also licenced for the expanded metal system of channel-arch flooring for warehouses, and the employment of expanded metal and cement for interior and exterior walls.

The Patent Vulcanite Roofing and Asphalt Company sends us a catalogue which consists principally of photographs of buildings in

which their material has been employed—a form of illustration which is not very much to the point. At the end of the book, however, are some sections showing the application of the material, and especially drawing attention to the saving of room in the upper portion of a house owing to the capability of the material (alternating with asphalt) being laid as a flat roof instead of with the slope necessary for tiles or slate. The vulcanite roof has, we believe, stood very strong tests in regard to fire-resisting quality.

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APPOINTMENT.—Mr. W. D. Caroe, F.S.A., architect to the Ecclesiastical Commissioners, has been appointed architect to the Deau and Chapter of Canterbury, in place of the late Sir Arthur Blomfield.

BOOKS RECEIVED.

ENGINEERING COST ACCOUNTS. By Francis G. Burton. Second edition, 3s. (The Technical Publishing Company.)
THE LAND AND HOUSE PROPERTY YEAR-BOOK FOR 1901. (Estate's Gazette Office.)

Correspondence.

To the Editor of THE BUILDER.

THE DATE OF THE PANTHEON.

SIR,—Would you be obliging enough to correct an error of your compositor? In column 3, page 130, of my second Royal Academy Lecture he left out an "8," putting "13 A.D." instead of "138" in the date of the building of the Pantheon at Rome.

My attention was drawn to it by one of my foreign correspondents, who asked me if I dated its erection from Agrippa, who died in 12 A.D. He supposed it showed a want of agreement with Mr. Chedanne's researches.

G. AITCHISON.

BUILDERS' FOREMEN AND TRADES-UNIONS.

SIR,—Having seen so many attacks on builders' foremen who are members of a trade union, the latest being those made at the dinner of the Provident Institution of Foremen and Clerks of Works, would you kindly give me (as a foreman belonging to a trade-union) space for a few remarks on the other side of the question?

In the first place builders' foremen, unlike poets, are made, not born (I notice one of the speakers at the above dinner is in favour of the evolution); the majority of them have served their time at a trade, and worked for a certain period at it; during that time, if they have troubled to think about it, they have perceived the benefits of combination; for benefits there must be, or why the masters' associations? When they have obtained a foremanship, the need for belonging to a workmen's combination no longer exists; but they are still men, most probably married, with a family, and like all men subject to sickness; that is the reason they still belong to the union. The remarks made at the above dinner as to serving two masters are, I think, beside the question, as they ignore the friendly society side of it; the speakers should, as a matter of justice, recognise that a trade-union is not formed for the sole purpose of fighting the masters. If instead of calling the union hard names at public dinners the masters were to try and perfect the scheme proposed some time ago, whereby the foremen could have a trade benefit society independent of the workmen's unions and auxiliary to the friendly societies, they would confer a lasting good, both to themselves and their foremen. As far as I am aware the existing societies for foremen do not include any provision for regular sick-pay.

A BUILDER'S FOREMAN
BELONGING TO A TRADE-UNION.

"INDIGENT BLIND SCHOOL."

SIR,—In your "Notes" of last week's *Builder* we see that we are credited with the appointment of honorary architects and surveyors to the above charitable institution.

This is not so, as Mr. Roumieu was only appointed honorary surveyor. He visited and reported on the site chosen at Leatherhead, but the designing and carrying out of the new schools has been placed, by the Committee, in the hands of another architect.

ROUMIEU & AITCHISON.

THE STUDENTS' COLUMN.—In consequence of the pressure of other matter, our Students' Column article ("Sanitary Fittings and Plumbing") is held over until next week.

THE PEABODY FUND.—In the thirty-sixth annual report of the Peabody Fund, for the year 1900, it is stated that on December 14 last her late Majesty Queen Victoria granted to the Governors, and their successors in office, a Royal charter incorporating them under the name and style of "The Governors of the Peabody Donation Fund." In pursuance of the directions contained in the charter, all the estates and property belonging to the Trusts will now be vested in the Corporation by name, and arrangements for this purpose are in progress. At the end of the year the Governors had provided for the artisan and labouring poor of London 11,439 rooms, besides bathrooms, laundries, and lavatories. These rooms comprised 5,159 separate dwellings, viz., 100 of four rooms, 1,770 of three rooms, 2,440 of two rooms, and 849 of one room. On the Home Hill Estate twelve blocks of buildings of forty rooms each, besides laundries, lavatories, &c., are now in course of construction, and it is hoped, will be ready for occupation by the end of the year.

GENERAL BUILDING NEWS.

COUNTY SCHOOL, BARRY, GLAMORGANSHIRE.—Barry Intermediate School, which has undergone considerable enlargement, has just been reopened. The school buildings are erected on an elevated site near the Buttrills at Barry, and as now completed provide accommodation for 144 boys and eighty girls. The first school was completed in 1895, and in 1897 there were added two new ordinary classrooms, new laboratories, and cookery kitchen. The work just completed includes the enlargement of the assembly-hall, the building of one new ordinary classroom for boys, and of new chemical and physical laboratories, new science lecture-room and art studio. The old workshop has been converted into two cycle stores, and the workshop stands in place of the old chemical laboratory, and the rooms formerly providing a physical laboratory and balance-room have been converted into a gymnasium. The entrances and cloakrooms are separate for boys and girls, and are placed at the west and east ends of the main building respectively. There are now four ordinary classrooms, and a large assembly-hall in which when required four classes can be accommodated. The old building was a one-story building, but in this last contract the roof was taken off the centre part and a floor put over the present assembly-hall, on which are the new laboratories, lecture and balance and art rooms. The old art studio has been converted into a staircase hall and a stone staircase has been erected. The main corridor on the ground floor runs through from end to end. All the rooms are entered from the corridors, and the classes are so arranged as to have left-hand light, and chiefly north light. The cloak-rooms have been considerably enlarged, and the accommodation formerly used by the caretaker has had to be taken in for teachers' rooms and stores. The head and assistant teachers have private sitting-rooms. In a new detached building are now provided dining-halls for boys and girls, with pantries, &c., and attached to them is the caretaker's house with direct connexion with each hall. The floor of the assembly-hall and of the first floor rooms are laid with wood blocks by Mr. Ebner, of London, and the corridors and cloak-rooms have been refloored in tiles. The first floor is fireproof, formed of steel joists and girders, and concrete, by Messrs. Homan & Rodgers, of Manchester. The contract for the alterations and additions just completed has been carried out by Mr. Alban Richards, of Barry; Mr. W. Fry, of Cardiff, acting as clerk of works. Mr. W. Britton, of Barry, has in hand now a contract for new boundary walls and other work of the new recreation grounds. The cost of the present alterations and additions to the school has been £3,200, and the price for the other work will add another 818. The architect is Mr. W. H. Dashiwood Caple, of Cardiff.

DUNOON GRAMMAR SCHOOL, ARGYLSHIRE.—This building has just been opened by Mr. D. N. Nicol. As now completed, the whole building is of two stories. There are the usual classrooms and, in addition, an art room, lecture-room, chemical laboratory, physical laboratory, cookery-room, music-room, rector's room, lady teachers' room, and separate cloakrooms for boys and girls and infants. Exclusive of the science and art rooms, there is accommodation for 820 scholars. The architect was Mr. Wm. Fraser.

PROPOSED ENLARGEMENT OF MIDDLESBROUGH ASYLUM.—Mr. A. G. Malet, Local Government Board Inspector, held an inquiry at the Municipal Buildings, Middlesbrough, on the 27th ult., respecting the application of the Town Council for permission to borrow 23,000l. for purposes of the Middlesbrough Borough Lunatic Asylum. The proposed works comprise additional blocks for 160 patients, night nurses' quarters, and staff cottages. The scheme was explained in detail by the architect, Mr. A. J. Wood, of London.

ELECTRIC LIGHTING NEWS.

ELECTRICITY WORKS, DEVONPORT.—The foundation stone of the Devonport Corporation Electricity works, which are in course of erection in Newport-street, Stonehouse, was laid on the 21st ult. Mr. C. Furness is the engineer, and Mr. A. N. Jones the builder.

ELECTRIC LIGHT, FULHAM.—The inauguration of the electric light in Fulham took place on the 1st ult. The generating station is situated near Vandsworth Bridge. There is a refuse destructor in connexion with the scheme. Mr. F. H. Medhurst was the engineer, and the plant was supplied by the General Electric Company.

ELECTRIC LIGHTING, SUNDERLAND.—On the 1st ult. Mr. M. K. North, an Inspector to the Local Government Board, held an inquiry at the Town Hall, Sunderland, into an application by the Corporation for sanction to borrow 73,000l. for purposes of electric lighting. The scheme was explained by Mr. J. F. C. Snell, the Corporation Electrical Engineer.

ELECTRIC LIGHTING, NEWCASTLE.—The Newcastle Corporation having applied to the Local Government Board for sanction to borrow 100,000l. under the Newcastle-on-Tyne Tramways and Improvement Act, 1899, Mr. A. A. G. Malet,

A.M.Inst.C.E., held an inquiry at the Town Hall, on the 26th ult., into the subject matter of the application. Mr. Le Rossignol, the Resident Electrical Engineer, described the scheme, which is for lighting the principal thoroughfares.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, UNITED FREE CHURCH, ABERDEEN, ABERDEENSHIRE.—The circular window behind the pulpit in the east end of this church has been replaced by one of stained glass. The work was executed by Messrs. Swaine, Bourne, & Sons, of Birmingham, under the supervision of Mr. George Couets, of Aberdeen.

MEMORIAL WINDOWS, WINCHOMBE CHURCH, GLOUCESTERSHIRE.—Three stained glass windows have been placed in the north aisle of Winchcombe parish church, in memory of the late Mrs. Dent, of Sudeley Castle. The windows were the work of Messrs. Powell, of Whitefriars.

FOREIGN.

FRANCE.—The Municipality of Paris has renewed its negotiations with the State in reference to the long-talked-of subject of the lighting of the Tuileries gardens with electricity.—The Government has established a French School of Oriental Art, on the model of the existing French schools at Rome and Athens. It will have for its primary object the archaeological exploration of the Indo-China peninsula and the neighbouring regions.

Work is at work on the friezes, after sketches left by Puvion de Chavannes, which were intended to crown the frescoes executed by the deceased artist in the Pantheon.—In the small square of St. Germain des Prés, at Paris, there has been set up the portico in ceramic ware which recently stood on the Esplanade des Invalides, and which was carried out at the Sevres manufactory. In the centre of the portico is an alto-relief figure, symbolising "Le Céramique," which has been modelled by M. Coutan. In the opposite square are being erected the fragments of a Gothic cloister which was formerly part of the ancient Bibliothèque des Benedictins, and was built by Pierre de Montreuil.—Parliament will be shortly occupied with a scheme for the improvement of the canal from the Escout to the Saône, and of one or two other connecting canals, and also with the general question of the navigable character of the Loire between Nantes and Angers; also the improvement of the basins and ports of Marseilles, Bordeaux, Havre, Rouen, Dieppe, Saint-Nazaire, Bayonne, and Cette.—M. Injalbert's group of "Faunesses et Satyres," which, as before mentioned, was refused by the town of Montpellier as immoral, is now to be offered to Paris.—The municipality of Reims intend to place in their museum the statue of Louis XV, by Pigalle, now on the Place Royale, and which has already suffered injury at the hands of Republican enthusiasts. The statue of Colbert will be erected in its place.—M. Girault, the architect of the Petit Palais, has been appointed Architect to the Palace of Fontainebleau, in place of M. Boitte.—M. Paul Cbarbonnier, of Nancy, has been appointed architect in charge of "Monuments Historiques" for the Department of Meurthe-et-Moselle, in place of the late M. Schuler.—M. Treppey-Bailly has been appointed Architect of the Right "Section of Architecture" of the city of Paris, comprising the Ninth and Seventeenth Arrondissements, in place of M. Saufroy, retired. M. Refol has been appointed Architect to the Second Section (Third and Eleventh Arrondissements).—M. Decraix, architect, has been commissioned to erect a new Hôtel de Ville at Calais at an estimated cost of 750,000 fr.; and the Municipality of the same town has commissioned M. Constant, engineer, to build a new theatre at a cost of over a million francs.

AUSTRALASIA.—A conference of Australian architects, held in Sydney, has decided to form a Federal Institute of Architects. Whilst recognising the value of the R.I.B.A. examinations, and strongly urging young Australian architects to qualify both for the Associateship and Fellowship of the Institute, the general feeling is that architects at the Antipodes are "too far away from the old country to reap any special advantage therefrom, and if affiliated lose our individuality, and to a certain extent our independence, and sink to the level of a small provincial society in England." "An Australian Institute should occupy the same position in relation to the parent society that the colonies occupy towards the mother country;" such is the opinion in Australia. It is proposed that the Federal Institute should be independent of, but work in harmony generally, with architects in other parts of the world for the welfare of the whole profession. It is held that the passing of the Royal Institute of British Architects' examination by Australian architects should be regarded in the same light as colonial medical men look upon the taking of an English degree—viz., as an extra qualification, giving them a higher status in their profession.—The New Zealand Government has invited competitive designs for new Houses of Parliament; the buildings are estimated to cost 100,000l. The first, second, and third premiated designs are to be awarded 500l., 200l., and 100l., respectively.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.

—Messrs. Johnson & Phillips, electric cable manufacturers, &c., at Old Charlton, have opened a West End depot at 37, King-street, Covent Garden.—A company has been formed, under the title of "W. Oliver Sons & Howard, Limited," for the purpose of acquiring and combining the business of Messrs. W. Oliver & Sons, of 120, Bunhill-row (wainscot, mahogany, and general timber merchants), and the hardwood portion of the business of Messrs. W. W. Howard Bros. & Co., of 100, Fenchurch-street. The temporary office of the company is at the latter address, and the registered office at 120, Bunhill-row. (See advertisement in this week's issue.)

CARPENTERS' HALL LECTURES.—The series of five Thursday Evening Lectures at Carpenters' Hall commenced on the 21st ult., with a lecture by Mr. H. H. Statham on the Architecture of the Paris Exhibition. He said the architectural features of that exhibition had afforded a remarkable evidence of the architectural genius and power of impersonation of the French, and the temporary architecture was of interest in another sense; it suggested a special problem, for temporary architecture need not have, and indeed ought not to have, the same qualities as permanent or monumental architecture. With a plan exhibited on the screen the lecturer sketched the history of the site, and the gradual extension of the exhibition ground in each exhibition since that of 1856, when the Palais de l'Industrie was built. He then described in detail the new bridge and the two art palaces on the Champs-Élysées, the beautiful permanent features which the Exhibition had left; a number of photographs of these and a plan of the smaller art-palace were shown with the lantern. They would next take the temporary buildings, of which a number of photographs were shown, commencing with the entrance gate from the Place de la Concorde; then taking the buildings of the Esplanade des Invalides going from north to south; then some of those of the Champ de Mars, and concluding by a series showing the buildings on the right and left banks of the river, ending with the Italian Palace which formed the eastward termination of the Rue des Nations.—On the 28th ult. the second of the course of lectures was delivered by Mr. H. C. Richards, M.P., K.C. The subject was "Old London," and it is an encouraging sign for those who are endeavouring to prevent the obliteration of the existing remnants of old London, that the lecture attracted a large audience. Antiquaries did not perhaps glean many new facts from the lecture, but an illustrated discourse by so able and enthusiastic an antiquary as Mr. Richards will always be listened to with interest. The lecturer stated that Cornhill was the site of the first Roman settlement in London, and that here was built the first Christian church of London. Cheapside was not so old, but its history as an inhabited area could, nevertheless, be traced for a thousand years. The fact that William the Conqueror and the citizens of London so readily came to terms, to the great advantage of London property, was ascribed by the lecturer to the circumstance that the Bishop of London at that time was also a Norman, and that for some time before the Conquest Norman influence had become a power in the city. Mr. Richards referred in caustic terms to the disappearance of certain ancient bequests, and the callousness of the City and County ceremonies, but gave due credit to the London County Council for its action in appointing a committee to keep a watch upon all places of historic interest within the county.

WHAT IS A "CURTLAGE."—Under this heading the following appears in the last issue of the *Sanitary Chronicle of St. Marylebone* (monthly):—"The word 'drain' under the Metropolitan Management Acts is defined to mean and include any drain of and used for the drainage of one building only, or premises within the same curtilage," it also includes drains for draining any block of buildings by a combined operation under the order of a Local Authority. The word 'sewer' is only defined in the statute by a process of exclusion, pipes for draining premises must apparently be either sewers or drains, and if they are not drains then they are 'sewers.' It is hardly necessary to observe that sewers are under the jurisdiction of Local Authorities, drains are private matters. Golden Horse Yard consists of a group of stables with living-rooms over them, enclosing a yard approached from Taunton-mews, there is also a way into the yard through two houses in Linhope-street, the back doors of these houses opening on to the yard. The yard is entirely enclosed by the stables and the two houses in Linhope-street. The drainage of the stables and houses was found to be defective, and a notice from the Council duly served upon the owners to remedy the defect. Thereupon the owners sought to cast the responsibility on the Council, arguing that the drain in this confessedly private yard was 'a sewer.' The owners were informed by the officers of the Sanitary Department that the yard was 'a curtilage,' and the stables, &c., were all situated in the same curtilage, and, therefore, the various conduits were private drains and not sewers. This question on summons was heard before the

stipendiary and ably argued on both sides. The solicitor to the Council relied upon certain leading cases and the facts to prove the yard was curtilage to the stables generally. On the other side it was contended that the houses being more of the nature of stables than houses, this common yard could not be said to be the curtilage of any one of them or the curtilage of all of them, and that the idea of curtilage was insupportably connected with that of dwelling-house and could not be applied to stables. The stipendiary adopted this view, and gave his judgment in favour of the defendants, but granted a 'case.'

FIND OF POTTERY.—The Dover correspondent of the *Morning Advertiser* says that one of the finest collections of ancient Roman pottery ever found in Kent has been discovered quite close to Walmer Castle, the Cinque Ports residence of Lord Salisbury. The discovery was made by Messrs. Mawson, landscape gardeners, of Windermere, while excavating at Walmer Lodge. Altogether the collection comprises about forty pieces. They have been removed to one of the buildings adjoining the grounds, where they are now being privately exhibited. According to archeological authorities who have seen them some of the specimens are very valuable. Some of the pieces of pottery are in a remarkable state of preservation.

IMPROVEMENT SCHEME, LEEDS.—A Local Government Board inquiry was opened by Mr. Robert Bicknell, M.Inst.C.E., on the 1st inst., in the Council Chamber at the Leeds Town Hall, with reference to the scheme of the Leeds Corporation for clearing the vicinity of Quarry Hill of all its back alleys, dark courts, and insanitary property. The area proposed to be dealt with is 311,318 square yards in extent. In this area are 2,104 dwelling-houses, 177 joint dwelling-houses and shops, five lodging-houses, forty-eight public-houses, one board-school, one Roman Catholic school, one church, three chapels, four Jewish synagogues, four Sunday-schools, and 360 warehouses, mills, factories, &c. The miscellaneous buildings, it appears, include ten bakeries, four clubs, two cow-houses, three slaughter-houses, one herring-curing establishment, one sausage-skin factory, one tripe factory, and one pigery. The carrying-out of the scheme will disturb between 4,000 and 5,000 people, and, according to the City Engineer, will cost the ratepayers of Leeds 298,054*l.* The Corporation will have to pay 450,567*l.* for property, and 77,467*l.* for alterations to, and the formation of, streets—a total of 528,034*l.* From this sum is deducted 225,000*l.*, as the amount the Corporation is likely to obtain for surplus land.

LAMBETH COUNCIL AND TENDERS FOR JARRAH.—At a meeting of the Lambeth Borough Council held on the 21st ult. at the Town Hall, Kennington, the General Purposes Committee submitted the following list of tenders received for the supply of 3,000 loads of jarrah wood for paving purposes during the ensuing summer:—Jarrah Timber and Wood Paving Corporation (as required), 7*l.* 12*s.* 6*d.* per load; Churchill & Son (May, June, and July), 7*l.* 3*s.* per load; W. Griffiths & Co. (May, June, and July), 7*l.* 2*s.* 6*d.* per load; Millars' Karri and Jarrah (May, June, and July), 7*l.* per load; Jarrahdale (May, June, and July), 7*l.* per load; A. F. Manuelle (as per specification), 6*l.* 10*s.* 6*d.* per load; Acme Wood Flooring Company, Limited (May, June, and July), 6*l.* 10*s.* 3*d.* per load. The committee stated that with the tender from the Jarrahdale Jarrah Company was enclosed a letter from Mr. F. Chapman, who stated that:—"The freight market has been ruling rather high, but it would be quite prepared to do what I did on a previous occasion with the fall of the freight market." In commenting upon this letter the committee stated that although the tender appeared on the face of it to be 3*s.* 9*d.* per load in excess of the lowest tender, it was possible that the proposal as to freight might vary to that or even a greater extent. In addition the company had given every satisfaction in previous deliveries, and a considerable benefit was obtained from the saving on freight. The committee, therefore, recommended the Council to accept the tender of the Jarrahdale Jarrah Forests and Railways, Ltd., for 3,000 loads of hardwood at 7*l.* per load subject to the Council receiving any benefit in the fall of the freight market. Councillor Thwaite, as an amendment, proposed the acceptance of the tender of the Acme Wood Flooring Co. at 6*l.* 10*s.* 3*d.* per load. He said that he could not understand the committee's recommendation when, by accepting the lowest tender, the Council would save 562*l.* Councillor Hubbard seconded the amendment, which, after further discussion, was carried. It was then agreed to unanimously as a substantive motion, and the contract was thus awarded to the Acme Wood Flooring Co.

BRISTOL ASSOCIATION OF CLERKS OF WORKS.—The annual dinner of the Bristol Clerks of Works and Builders' Foremen's Association was held on Saturday night at the Royal Hotel. The chair was taken by Mr. Frank W. Wills, President of the Bristol Society of Architects, and he was supported by Councillor Lee, Mr. W. J. Steele, Deputy City Engineer; Mr. H. Dare Bryan, Hon. Sec. Bristol Society of Architects; Mr. A. Krauss, President of the National Association of Master Builders of Great Britain; Mr. G. Humphreys, President of

the Bristol Association of Master Builders, and others. In the course of the evening Mr. W. Kidwell proposed "Trade and Commerce," which was acknowledged by Councillor Lee, who quoted figures showing that between the years 1800 and 1900 the population of Bristol had increased eight-fold, the tonnage of the port in the last sixty-seven years fifteen times, and the rateable value twelve times. Mr. F. N. Cowlin proposed the toast of "The Architects," and Mr. H. Dare Bryan having responded, Mr. W. Hollyman proposed "The Master Builders." Mr. Krauss, in responding to this toast, urged upon the members of the Association to adopt as their motto in the north, had their scheme for accidents, sick and annuity provision, as well as life policies. In the north the assistance kindly and willingly rendered by the Master Builders, plus the contributions of the members, had already put this on a sound and satisfactory footing. He pointed out to the members that they could not serve two masters, the men's trade union and the builders, and remarked that they would be benefited by forming their association into a benefit society, so that those members who now belong to the Trades Union might be free from the men's union and at the same time lose none of the benefits. The Chairman proposed "The Bristol Association of Clerks of Works and Builders' Foremen," and congratulated his hearers on the progress the Association had made.

FIRE PREVENTION EXHIBITION AT THE AGRICULTURAL HALL. A meeting of the commercial section of the British Fire Prevention Committee was held on the 6th inst., Mr. F. R. Farrow presiding, when most of the firms represented took the opportunity of announcing their intention of participating in the Fire Prevention section of the Building Trades' Exhibition. Among the firms to whose space has already been allotted are the Asbestos and Asbestic Co., Ltd.; Messrs. D. Anderson & Son; The British Luxfer Prism Syndicate, Ltd.; Mr. Bugg; The British Uralite Co., Ltd.; Messrs. Broadbent & Co., Ltd.; Messrs. Clark, Bunnett, & Co., Ltd.; The Crittall Manufacturing Co.; The Conduit and Insulation Co., Ltd.; The Columbian Fireproofing Co.; Messrs. Green & Co.; Messrs. Hobbs, Hart, & Co.; Mr. F. Jones; The Mural and Decorations Syndicate; The Expanded Metal Co.; The Non-Flammable Wood Co.; Messrs. Pilkington Bros.; Messrs. Potter & Co., Ltd.; Messrs. G. A. Williams & Sons. Details as to classification were discussed with Mr. Hammond, Chairman of the Exhibition Sub-Committee, and it was arranged that with regard to firms that had not yet definitely applied, application should be made before March 15 to the offices of the Committee, 1, Waterloo-place, Pall-mall.

HULL MASTER BUILDERS' FEDERATION.—The members of the Hull Branch of the Yorkshire Federation of Building Trades Employers held their annual dinner at the Grosvenor Hotel, Hull, on the 21st ult. The President (Mr. C. Hebblewhite) presided. The health of the King and Queen having been honoured, Mr. E. Good (Vice-President) proposed "The Navy, Army, and Auxiliary Forces," to which Mr. W. S. Walker briefly responded. The toast of "Success to the Hull Federation of Building Trades Employers" was proposed by Mr. Hewitson. He said that during the past few years they had been passing through uncertain and irregular trade. He hoped that all disputes between master and man had been settled for some time to come, and that they might have a quiet and prosperous time. He hoped that the power of that organisation would always be used in the direction of settling disputes in an amicable manner. The Chairman, in responding, said that there was not one in that room that had the idea of oppressing their workmen. There were times when difficulties did and would always arise, and some fresh means should be adopted to settle those difficulties. He assured them that if the demands made upon them in the future were reasonable, they would be met in a reasonable spirit. Labour during the past year or two had cost 33 per cent. more than it did a few years ago, and that was a state of affairs the builder would have to reckon with. He was bound to confess that in hundreds of instances the masters did not get a fair return for the money they paid. He defied any man on the opposite side to say that they did if they knew anything about practical work. With all the latest machinery there were hundreds of instances where the same amount of work was not produced as when he had to take the plane and saw in his own hands. He hoped, however, that in the future they would be able to adjust matters on more peaceable lines.—Mr. J. Watson submitted the toast of the "National and Federated Branches and Kindred Associations of the Building Trade." After speaking of the growing strength of the various branches of the trade, he went on to say that with prices fluctuating as they had been lately, it was most difficult for the builders to make estimates. Prices had gone up by leaps and bounds. Within the last six or seven years the cost of labour and materials had gone up 25 per cent. in Hull. He very much doubted whether there could be any building of a speculative nature that could show a reasonable return at the present prices. Mr. Longden, in responding, said always a rule that as wages went up a penny per hour the work went down twopence per hour. Messrs. G.

England and J. Biggin also briefly responded. Mr. F. Beilby gave "The City of Hull and Hull" and Mr. Councillor Scott, P., briefly responded. Councillor Scott, J.P., gave "The Architects and Surveyors," to which Messrs. Walker and W. E. Barry responded. Mr. J. Townley proposed "The Visitors," which was acknowledged by Messrs. Rhodes and Earnshaw.—The Executive of the Yorkshire Building Trades Employers' Federation met at the Builders' Exchange, Posterngate, on the 21st ult. The attendance, however, was not large owing to the Yorkshire Association's meeting in London, at which many of the Yorkshire delegates were engaged. The Yorkshire President (Mr. James Longden, Sheffield) occupied the chair, and was supported by representatives from Sheffield, Barnsley, Bridlington, Halifax, Huddersfield, &c. The delegates appointed to carry out organising work during the past month, reported satisfactory progress, and said that further meetings had been duly arranged. This being the annual executive meeting the secretary (Mr. Hanson, Halifax) was unanimously re-elected to that position, and Mr. W. R. Thompson (Devsbury) was re-elected to the treasurer'ship.

CARFAX IMPROVEMENT, OXFORD.—An inquiry into an application by the Oxford Corporation to the Local Government Board to issue a provisional order to empower the Council to put to rights, with reference to certain lands required by them for the purpose of widening and improving Cornmarket-street, the powers of the Land Clauses Act, with respect to the purchase and taking of land otherwise than by agreement, was held at the Municipal Buildings, Oxford, recently, by Mr. H. H. Law, an Inspector to the Board. It was stated that the premises proposed to be purchased were No. 1, Cornmarket-street, the owners being the trustees of the St. Aldate Parochial Charities. Certain premises in the street having been pulled down, the Corporation had made a new building line, and this necessitated the pulling down of the premises at No. 1, which were known as the Creamery. The owners of the property had fixed the value at 5,000*l.* Evidence was given by the City Engineer, Mr. W. H. Whitte. After the inquiry the premises were visited by the Inspector.

INCORPORATED SOCIETY FOR PROMOTING THE BUILDING OF CHURCHES AND CHAPELS.—This Society held its usual monthly meeting on Thursday, 21st of February, at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. The first business was the reading and passing of a loyal address to the King. Grants of money were then made in aid of the following objects viz.: Building the first portion of the proposed new church of the Ascension, Victoria Docks, Essex (Fetted School Mission), 120*l.*; rebuilding on a new site the Church of St. James, Grove, near Wantage, 50*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Radcliffe-cum-Chackmore, St. John the Evangelist, near Buckingham, 30*l.*; Stourton Caudle Parish Church, near Sherborne, Dorset, 25*l.*; Stow Longa, St. Botolph, near St. Neot's Huntingdon, 25*l.*; Wesley Rocks, St. Ichn, near Stoke-on-Trent, 20*l.* The following grants were also paid for works completed: Denaby Main, All Saints, near Rotherham, York, 55*l.*; Huddington, St. Michael and All Angels, Droitwich, Worcester, 30*l.*; Erchfont, St. Michael and All Angels, near Devizes, Wilts, 20*l.*; New Brighton, Emmanuel, Cheshire, 20*l.*; Horley, St. Bartholomew, Surrey, 20*l.*; Crofton Park, St. Hilda, Cantford, Kent, 40*l.*; and Walthamstow, St. Paul, Essex, 40*l.* In addition to this the sum of 295*l.* was paid towards the repairs of nineteen churches from trust funds held by the Society. The Annual General Court of the Society will be held at 3 p.m. on Friday, the 17th May, at the Church House, Dean's-yard, Westminster, when the chair will be taken by the Archbishop of Canterbury, President of the Society.

WASHED SAND.—We have received a sample of washed pit sand from Messrs. Heather, Bailey & Co., Limited, Commercial-road, Lambeth, respectively, which they remark that the material comes from Erith, and that they have recently erected a plant to deal with it. The sand is said to be reasonable in price, and to be beneficial to numbers of builders who are at present obliged to wash their sand in the old way by hand. We find, on examining the material, that it is of medium-grain, slightly ferruginous, and composed almost exclusively of fragments of quartz and flint. The sand grains are, for the most part, sub-angular, and are of varying size; the largest, which are few in number, might be termed fine grit, and these are, nearly all, of white flint. It is certainly a good sample of builders' sand, free from shell fragments, and has been washed exceedingly clean.

CAPITAL AND LABOUR.

THE QUARRYMEN'S STRIKE IN NORTH DERBYSHIRE.—The strike of quarrymen in North Derbyshire, which has existed several weeks, has come to an end. As the result of a conference held at Buxton, the 1,500 men who refused to "sign on" under terms which had additions have resumed work, the agreement being that an engagement in the future be terminable by a month's notice on either side.

KIRKCALDY BUILDING TRADE.—The operative masons have received notice from the Masters' Association of a reduction of wages from 8d. to 8d. per hour, commencing at the end of May. The operatives have decided not to accept the reduction, holding that the strike of a halfpenny had not been taken off last year. Operative joiners have received notice of a reduction from 8d. to 7½d. They have decided against the reduction. Bricklayers at most of the buildings in progress in the district have been notified of a reduction of a halfpenny per hour, from 9½d. to 9d.

ABERDEEN PAINTERS' STRIKE.—The *Aberdeen Free Press* states that at a meeting of the members of the Aberdeen branch of the Scottish Amalgamated Society of House and Ship Painters, held in the Trades Hall on the 27th ult. for the purpose of considering what action the men were to take in the dispute which has been going on for some time, after a long discussion it was unanimously agreed to accept the finding of the masters and not contest the question further. The point in dispute was that rule 6 should be altered to read as follows:—"That the men shall be at a shop job or radius at the hour of commencing work, the radius to be one and a half miles, Union Bridge as a centre." The masters at first wished the radius, which was formerly one mile, to be doubled. The men objected and the masters agreed to make it one and a half miles, and to this the men have agreed. Other points were disputed, but these were mutually agreed to. The men asked that instead of 5s. extra per week being allowed for country work the figure should be 6s. The masters requested that country working hours should be regulated by daylight and other circumstances, but gave way, and agreed that in country work there would not be less than seven hours per day, and if more than eight that extra money would be paid.

NORWICH BUILDING TRADE PROSPECTS.—The strike on the part of the Norwich bricklayers still continues, and there is no immediate prospect of a settlement. What makes the outlook gloomier still is that various other operative branches of the building trade are making a move in favour of higher wages; and that even if the bricklayers get back to work the paralysis of the building trade promises to continue. We learn that the Norwich Master Builders' Association are in receipt of no fewer than three further demands. The Amalgamated Society of Carpenters have given notice for an advance of 3d. an hour and a proportionate increase for overtime, to take effect on June 1, 1901. The Navvies, Builders' Labourers, and General Labourers' Union are asking also for 1d. advance, to take effect on June 1, and the Amalgamated Society of House Decorators and Painters demand an increase of 1½d. an hour, the present rate being 6d., and various alterations of the rules. These latter, if granted, bring about a reduction of working hours, and would transfer to the painting trade all whitewashing and distemping done with hair brushes. The master builders have not yet fixed a meeting at which these demands will be discussed. —*Eastern Daily Press.*

LEGAL.

BUILDING DISPUTE AT HARROGATE.

The case of the Mayor, &c., of Harrogate v. Holmes came before Mr. Justice Cozens-Hardy in the Chancery Division last week, concluding on the 18th ult., an action brought by the Mayor, Aldermen, and Burgesses of the Borough of Harrogate against Mr. William Holmes, of 1, Valley-drive, Harrogate. The plaintiffs asked for an injunction to restrain the defendant, his contractor, builders, agents, and workmen from erecting or permitting any buildings already erected by defendant to remain in Valley-drive and Valley-mount, in the Borough of Harrogate in such a manner as to be contrary to the Harrogate Corporation Act of 1893 and the by-laws in force within the borough; or otherwise than in accordance with the plans deposited by the defendant with the plaintiffs pursuant to the by-laws and approved by the plaintiffs. The Corporation also asked for a declaration that they were entitled to remove, alter, pull down, or otherwise deal with the works constructed by the defendant contrary to the provisions of the Act of 1893.

Mr. Micklem, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. E. Ve, K.C., and Mr. Perks represented the defendant.

Mr. Micklem said that the action was brought by the Corporation of Harrogate to restrain the infringement of its building by-laws. Harrogate was incorporated by charter in 1884. Before the Commissioners had been appointed to carry out the provisions of the Harrogate Improvement Act of 1841 and they had adopted the provisions of the local Government Act of 1858 and became the local Board of Health. The Commissioners passed certain by-laws in accordance with the 1858 Act and incorporated the Public Health Act, 1875, and those by-laws became the by-laws of the Corporation. The plaintiffs complained that the defendant had put up large buildings which they were not pulled down, would fall

down shortly; plans were approved; but the defendant had erected buildings contrary to them, and he had now delivered amended plans, which the plaintiffs had rejected for good reason. Upon approving a plan depended such matters as the thickness of walls and the height of buildings. His lordship would hear in evidence that the defendant had put up walls 4½ in. thick, rising to a height of 70 ft. Since the action had been set down for trial some part of the lower wall had begun to bulge. The second by-law which had been infringed was the provision as to air space at the back of the houses. The by-laws stated that a building of three stories should be 20 ft. from the nearest property, but in the houses of the defendant, which were four stories, there must be 25 ft. of space at the rear of the premises. The approved plans were for three-story buildings, but the defendant had erected houses of four stories and three attics. The third infringement had reference to the height of a building adjoining the street.

His Lordship asked if there was any dispute as to facts?

Mr. Eve said he knew nothing about the defendant's houses tumbling down. There would be no dispute as to the height of the houses to a particular point on the opposite property or as to the height of the eaves in front.

Mr. Micklem stated that the four houses of the defendant stood at the corner of streets known as Valley-drive and Valley-mount. The plans were passed in 1896; two houses had been erected in accordance with the plan, and two other houses were those in question in the action.

Mr. Eve stated that the defendant thought there were too many builders on the Corporation.

Mr. Micklem said Valley-mount was 36 ft. wide, and it went round the rear of the defendant's houses into Valley-drive. Valley-mount was 60 ft. wide. The plaintiffs contended that the defendant could not put up a house facing Valley-mount of a greater height than the width of the road.

His Lordship asked the defendant's counsel if he disputed that he was building contrary to the plans.

Mr. Eve replied that the plans which were approved by the Corporation were subsequently found not to be in accordance with the by-laws, and it became necessary to modify the plans.

Mr. Micklem said the by-laws provided that every building to be erected and used as a dwelling-house should have in the rear 150 square feet free of any erection thereon, and by the Corporation Act no house was to be erected of a greater height than the distance from the front of the building to the opposite side of the street. The plaintiffs gave the defendant notice not to continue building in contravention of the by-laws, but no notice was taken of that.

Mr. Geo. Richardson Strachan, M.Inst.C.E., examined by Mr. Micklem, said he had examined plan A, which was submitted, and disapproved of it, in January last. Witness had not visited the locality, but had studied the plan, and he should say it represented a building of slight, flimsy structure, and in a condition of critical instability. That was to say, if one part gave way the whole structure would come down like a pack of cards.

Mr. Eve said he admitted that the building was not in accordance with any of the plans approved. The defendant's point was that it was in accordance with the by-laws.

Mr. Parker observed that in cases of this sort if a plan was disapproved on any ground which was not tenable by reason of the by-laws, then the disapproval did not prevent the building being erected in accordance with the plan. It was pleaded generally by his learned friend for the defendant that the whole building was in accordance with the by-laws, and therefore he had a right to go on with it; but this was merely to show the court that the building was of such a nature that it was a building which never could have been passed because it would be a danger to the public. The thickness of the walls provided by the by-law was one of the safeguards against such a contingency.

Mr. Frank Bagshaw, the Borough Surveyor of Harrogate, in his evidence, said that he had been connected with the Harrogate Corporation for fourteen years. The road on the Valley Park Estate came under the control of the Corporation. The Corporation in 1896 approved certain plans submitted by the defendant for the erection of twelve houses in Valley-mount and those plans were approved in July, 1896. Two houses were erected in accordance with the plans, but in June last witness called defendant's attention to the fact that two other houses differed from the plans which had been approved. Amended plans were sent in but they were disapproved because the height of the eaves of the buildings exceeded the height permissible in proportion to the width of the street; the drainage did not agree with the plans. Some of the bedrooms had less than 100 superficial feet, had no fireplaces, and were without proper ventilation; the causeway was not wide enough, and the defendant was excavating within 600 yards of the old sulphur well. Some of the plans showed that the buildings were to be of three stories, but the defendant had put up four-story buildings, the means of exit from which were totally inadequate. He had seen the

buildings recently, and there was a big bulge in one of the walls which had to be shored up.

Cross-examined, the witness said that no plans of the buildings in question had ever been approved by the Corporation. The drainage was put right in subsequent plans, and to a certain extent the small bedrooms had since been ventilated. As to the statute prohibiting excavations within 600 yards of the old sulphur wells, he agreed that the defendant only excavated a few feet for the purpose of laying foundations. A wall 4½ in. thick was not common in Harrogate. He thought that some of the walls of defendant's houses should be considerably more than 9 in. in width.

This concluded the case for the plaintiffs, and Mr. Eve said that the action had been founded on three points, *i.e.*, that the plans were not approved by the plaintiffs, that the houses were in violation of the statutory provision that the height should be equivalent to, and not exceeding, the width of the road to which they fronted, and that the ventilation space at the back was not in accordance with the by-law. He admitted that the defendant had not got the approval of the Corporation to the plans, and that the height of the buildings was in excess of the height permitted, but he contended that the ventilation was thorough, and that the defendant had complied with the spirit of the by-law.

Mr. Justice Cozens-Hardy said he was very much impressed by the fact that some of the walls were only 4½ in. thick.

Mr. Eve thought that could be rectified, and if there was any danger from the internal walls being too thin, they could be converted into a proper thickness.

His Lordship did not suppose that the Harrogate Corporation desired to do anything but their duty, but the defendant was in mercy and he must make some terms with them.

Mr. Eve hoped that his lordship would bear in mind that the defects in construction were not put forward in the statement of claim.

His Lordship did not think that a public body was bound to go through the plans and specify every objection. The defendant had deliberately gone on building when he knew that his plans were not approved.

At this stage learned counsel consulted with their respective clients, and

Mr. Micklem informed his lordship that the parties had agreed to an order. The defendant was prepared to remove the upper part of his building, to strengthen all the walls as might be required by the Corporation, and to submit forthwith plans to be approved.

Mr. Eve stated that on defendant giving that undertaking there would be no order in the action except that the defendant should pay the costs.

His Lordship said he approved of the arrangement, and said it was a matter of extreme importance to the Corporation that builders should be taught they could not go on with buildings without the plans being approved.

FINSBURY-CIRCUS IMPROVEMENT

In the City of London Court, on the 26th ult., Messrs Rall Bros., 25, Finsbury-circus, sued Messrs. Werner, Beit, & Co., 120, Bishopsgate Within, by way of an appeal under the London Building Act, 1894, for an order to set aside an award, dated December 18, which had been made by Mr. Thomas Blashill and Mr. H. T. Gordon as surveyors in an arbitration with respect to premises in Finsbury-circus. Mr. R. H. Bray, K.C., and Mr. Rowlett were counsel for Messrs. Rall, and Mr. Macmorran, K.C., and Mr. Eower for Messrs. Werner, Beit, & Co. Mr. Bray said that the plaintiffs were the occupiers and lessors of Nos. 25, 26, and 27, Finsbury-circus. Their buildings were surrounded by a number of other buildings, of which, apparently, Messrs. Werner had taken a lease from the Corporation. They had pulled down those buildings, and they now wanted to pull down all Messrs. Rall's outside walls (the wall of No. 27) and there was an east wall (at No. 25), while the south wall formed the back part of the premises. The defendants wanted to pull all three of them down. If this were done the plaintiffs would be compelled to move from their premises for some months, and that would involve serious expenditure, probably amounting to 500l. That they naturally did not want to do. The defendants' contention was that under the Building Act they were entitled, as building owners, to do what the award had said they might carry out. Mr. Commissioner Kerr said the point in dispute was simply concerned with the construction of the Act of Parliament. As both parties had stated that they intended appealing whichever way the decision went, he would say at once that he was inclined to dismiss the appeal from the arbitrators. Before doing that the case might stand over so that the parties might go direct to the High Court, and have the matter decided there. —*City Press.*

THE LONDON BUILDING ACT:

AN "IMPRACTICABLE AND WORTHLESS" MEASURE.

At the Mansion House recently, before Alderman Sir H. E. Knight, Messrs. Weary & James, builders,

were summoned by Mr. Hugh McLachlan, the District Surveyor for the western division of the City, for having on the 14th ult. begun to execute certain work at 169, Fleet-street, without serving upon him a notice as required by Section 145 of the London Building Act, 1894. Mr. Weary, who appeared, said that notice was given. Mr. McLachlan stated that the document he received did not contain sufficient particulars. As he had to make returns to the London County Council, giving all details, he wrote to the defendants, and asked them, amongst other things, for the name of the owner of the premises. He received a reply to the effect that they did not know it. Sir Henry: I understand that the work done was the putting-in of a shop-front. This section requires the builder to state the situation, area, &c. Is he to make a survey? Mr. McLachlan: Evidently the law requires it. Sir Henry: Then the number of stories, and the "intended occupation" are required. The Act is so badly drawn that you ask a man to do the impossible. He could not state the "intended occupation," because the place was already occupied. The Chief Clerk: And you could not give the number of stories to a shop front? Sir Henry: The Act may have been drawn by some philosopher, who sat in his closet and thought it a theoretical accomplishment, but I look upon it as impracticable and worthless. Mr. McLachlan said that if the defendants now gave him the name and address of the owner he would be satisfied with the costs of the summons. Sir Henry: That is my business. You must not tell me what to do. Looking at the case all round, I dismiss the summons.—*City Press.*

WOODEN STRUCTURES ERECTED WITHOUT LICENCES.

On Tuesday, the 5th inst., at Marlborough-street Police Court, four builders were summoned for having erected wooden structures at various premises in Piccadilly, for viewing the procession on the return of Lord Roberts in January last, without having obtained licences as required under Part VII. of the London Building Act, 1894. The offences were admitted and a penalty of 40s. and 12s. 6d. costs was imposed in each case.

THE BLUE LIAS LIME PROSECUTION.

The prosecution under the Merchandise Marks Act, in which the Cam Portland Cement Company, Limited, are sued by the Blue Lias Lime Company for selling as blue lias lime that which it is alleged was not blue lias lime, was on Wednesday, at the Westminster Police-court, adjourned for a week, owing to the inability of Mr. Willis, who is prosecuting, to attend.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

21,810.—ELECTRICAL CURRENT METERS: *H. P. Davis and F. Conrad.*—For ampere (or volt) meters a single permanent U-shaped magnet is used, or for that may be substituted two U-shaped permanent magnets, set parallel to one another and having their like poles together, carrying two hook-shaped pole pieces of which the curved portions are disposed with a small interval between them and parallel to one another, with a curved and adjustable magnetical plate beneath the pole pieces; the pivots of a light movable frame are carried by two jewelled pins fixed in a horizontal rectangular frame mounted upon the magnet or magnets, the movements are damped magnetically with a flat plate that balances the movable frame and is passed between the pole pieces; two flat spiral springs carried by the jewelled pins are connected at their outer ends with the ends of the coil that is wound upon the bobbin of the movable frame, whilst the outer ends of the springs are secured to, but are insulated from, the arms of that frame; on the magnets is a curved scale which is traversed by a pointer upon the movable frame.

21,814.—A METHOD OF TREATING WOOD: *G. F. Lebiada.*—A preservative compound, consisting of a solution of formaldehyde combines with and tends to make insoluble the albuminous substances contained in the wood, and if sufficient of those substances is not in the wood, the formaldehyde should be mixed with a solution of agar-agar or some such gelatinous material. The invention is specified as being applicable for use with telegraph-posts, railway sleepers, and so on.

21,823.—A BRICKLAYING MACHINE: *F. H. Knight.*—The machine is intended for travelling along a rack at the top of a beam or girder that is fastened with pins or bolts to pierced standards. Rotating flexible arms, on to which the bricks are fed by hand, impel them into position beneath a pressing-roller mounted upon a winch shaft, of which the pinion will gear with the rack, the winch-spindle driving the arms by means of a friction clutch and an endless chain. The bricks are kept in their lines

with a separate guide-roller, or a straight-edge secured to the beam is arranged so as to press against one side of the wall, whilst the pressing-roller is flanged at the other side of the wall. A hopper applies mortar or grouting to the upper surfaces of the bricks upon the return motion of the machine. For the apertures of windows and doors, the machine lays dummy bricks made of wood or hollow metal, that are to be removed afterwards for ordinary bricks, at times which are joined with bells or gongs upon the beam, which is sounded by chains to counter-weights, and is lifted when the invention are specified; in one of them the roller, instead of the beam, is lifted after the laying of each second, third, or other course, by its being mounted upon a pivoted arm, so that it can be dipped to beneath the beam and for the laying of foundation or ground courses, the winch shaft driving it with footbed gearing upon the pivoted arm.

21,826.—PERCUSSIVE TOOLS: *A. Taylor.*—The hammer-head that strikes the chipping or other tool constitutes a part of a piston to be operated with compressed air that is forced from annular chambers through passages to either the top or the bottom of the cylinder. By means of a handle that is screwed into the inlet the tool can be held as an ordinary hammer.

21,877.—ELECTRICAL ARC LAMPS: *A. Tesmer.*—The two electrodes are made of nickel or a nickel alloy (or one of them may be made of copper), and are attached at a distance of a few millimetres apart, a small current being used under a high pressure, so that their wear shall be inappreciable as the end of the nickel electrode takes a coating of oxide from which the light is emitted. It is claimed that the employment of an alternating current of 1 ampere at 500 volts and electrodes having a diameter of three millimetres will produce a light of fifty candle-power.

21,880.—SURVEYING INSTRUMENTS, INCLUDING THEODOLITES: *R. Reeh.*—For stadiometers, miners' tachometers, theodolites, and kindred instruments which give readings in altitude and azimuth, the inventor contrives that an image of the azimuth and altitude circles shall be brought into the field of the telescope. He fashions the telescope trunnions in the shape of tubes which are provided with prisms and lenses; the tube on the left hand constitutes, together with a tube mounted upon the Y's and having a lens and a reflector, a microscope, that, aided by a split lens, will focus an image of the azimuth scale in the plane of the crossed wires. The Y's carry the altitude circle, which is graduated inside, an image being likewise produced by means of another tube having a lens and a reflector; a right-hand tube, and a split lens. Direct vision is provided for by means of the sufficient space between the halves of the lens.

21,920.—AN ATTACHMENT FOR DRAWING-COMPASSES: *A. H. Woodward.*—To adapt compasses for the holding of differently sized pencils is devised a blank having arms that form ears in which a tightening lever can be pivoted; when the lever is turned upwards the pencil becomes gripped between the toothed edges of the appliance.

21,929.—COCKS OF PIPES AND HYDRAULIC: *W. R. Sage.*—In order to drain water out of the cocks and so to prevent them from becoming frozen, an additional valve is made to open a duct into the drain pipe with the action of turning the plug in order to cut off the supply. Ingress of flood water to the stand-pipe is obviated with a check valve.

21,936.—A FLUSHING-WATER APPLIANCE: *C. Birbery and T. Stanish.*—A tubular stem sliding within a concentric stem that rises from the bottom of a cup mounted upon legs is fitted upon the outlet valve, a float which has a tubular stem slides upon the outside of the cup, the lifting of the valve for effecting a flush causes it to be locked through the engagement of a pawl pivoted on to the stem of the valve, with a slotted peak upon the float-stem. Upon the escape of water from the cup through a time-passage the float continues to fall until the pawl has been liberated through the impact of the tripping-lever against the bottom of an adjustable slot so as to let the valve fall down on to its seating. The top of the valve becomes closed with a loose disc when it has been lifted, and the disc is lifted through contact with the float-stem when the valve rests upon its seating, so that the valve-stem is thereby left free to act as an overflow pipe.

21,995.—CONSTRUCTION OF HOLLOW WALLS: *L. F. Fink.*—Dove-tail recesses are fashioned in building blocks so that they may take transverse dove-tail bonding blocks. The building blocks consist of an admixture of light beton made up of cement 1 part and sand 4 parts, a stronger beton or burned clay being used for the bonding blocks. In order to check the passage of moisture from the outer to the inner wall, tar or asphalt is applied to the inner surfaces of the building blocks and to the bonding blocks.

21,970.—A CUTTER FOR CONDUIT TUBES, &c.: *H. von Appen.*—On the jaws of the tool, which is intended for cutting through the tubes that serve to protect and insulate electrical conductors, &c., are mounted two or more parallel blades having their cutting edges curved and spaced apart; in one modification a blade will cut the outside protecting

tube at a distance from its end, whilst another blade cuts the inner insulating tube. Springs that extend between the pivoted handles of the tool serve to force the cutters against the tubes, and either anti-friction rollers or additional similar blades can be placed opposite the cutting blades.

21,971.—BASINS FOR LAVATORIES AND THEIR FASTENINGS: *R. W. MacDonald.*—The basin is fastened securely in two ways, upon the soil-pipe standard are disposed clamping rings with which arms are adjusted, and the soil-pipe, to the top of which the basin is fixed, is mounted upon legs which surround the trap below.

21,985.—HOISTING APPARATUS: *F. Price.*—Upon a shaft are mounted two winding-drums, the one drum being for lifting purposes and the other for the rope which operates the bucket; the relative revolution of the drums is provided for by means of a spiral groove having about three complete turns which is made in the end of the one drum, and will engage with a cranked pin at the end of the other drum.

22,104.—A GUARD FOR CIRCULAR SAWS: *F. Bodger and D. Handford.*—For circular saws and tools wherein the hood is raised automatically, a sleeve that will slide along an inclined rod (which is clamped on to the radial arm of the pillar) is fitted upon the hood, which is made of two plates set side by side with a space between them for the saw. As the wood is being pushed forwards beneath a curved rod it raises the hood. For means of access to the saw the workman hooks a stud upon the sliding sleeve into a hook that hangs above from the clamp of the rod and loosens the set-screw in the order that the radial arm may turn about the pillar.

22,141.—PREVENTION OF FIRE IN LIFTS: *F. Toy.*—A fireproof flap, which remains shut during all the time when the lift is not being used, is provided at each floor-level of the well. The flaps are raised whenever the lift is at work, being moved in unison with a rod upon which are projections to engage with slotted links. Of every link one end will slide in a guide upon the back of its corresponding flap, whilst the other end is secured with a pivot.

22,155.—CONSTRUCTION OF WALL LININGS, &c.: *P. Chick.*—The bricks are fashioned with undercut grooves, and the boards, skirting, wall-linings, or similar woodwork is fastened on to dove-tailed strips or strips, which are inserted into the grooves. The strips can be made so as to project as much as the thickness of the plaster, and thereby afford a guide for the plasterer, or they may be built in flush with the brickwork of the wall.

22,165.—A SPIRIT LEVEL: *A. Gohl.*—The inventor has devised a spirit-level tube which he shapes as a circle-quadrant and mounts upon a straight-edge, whereof the weaker portion is strengthened with a plate of metal; he also provides a U-shaped plate which is to be pulled up when the instrument is being used, and will thus protect the tube; the position of the bubble will be accurately read with a sliding index to which a vernier may be attached.

22,167.—LIFTING JACKS: *C. Busch.*—Between the two standards of the jack is a screwed shaft on which a nut travels up and down the shaft, being turned with a crank that operates by means of bevel gearing and pinions whereof one is affixed to the top of the shaft; beneath the load which it is desired to raise is laid a beam of which the ends are put upon the nuts of two of the jacks.

22,200.—SPIGOT-AND-SOCKET JOINTS FOR PIPES: *T. Cartman.*—The invention is for making a joint between pipes of hard metal or material, such as iron, brass, cast-iron, or pipes of soft metal or material; the soft pipe is inserted into the socket of the hard pipe for which it constitutes a lining, and hemp is used as a packing between the joint and the cement.

22,248.—AN APPLIANCE FOR PURPOSES OF VENTILATION: *R. T. Preston and G. C. Ralston (of Stone & Co.).*—The appliance is contrived for the drawing-off of foul air from buildings, tunnels, mines, and other places, into a tank by means of water or other liquid under pressure, and for effecting a discharge of the mixed air and water. Below the water-level in the tank is laid a double pair of ejectors, to which water is supplied under pressure. The foul air, after it has been drawn in through pipes, is discharged, together with the water, into an overflow pipe. Each ejector is fitted with an adjustable nozzle, and, for mines, the ejector-tank apparatus is rendered portable by being mounted upon wheels.

22,271.—MEANS OF HEATING BY ELECTRICITY: *A. Logé.*—Admixtures of finely pulverised metals and refractory non-conductors with a liquid, are moulded into resistances that will sustain high temperatures, and are pressed in the moulds so as to bring about uniform results; having been dried the articles are heated in hydrogen, though at the outset to a temperature that will just entirely reduce the oxide upon the particles of metal, then the non-conducting components are caused to "frit" (care being taken to exclude carbon) by increasing the heat up to the welding-heat of the metal, whilst in the atmosphere of hydrogen; the constituent parts of the compound comprise nickel, cobalt, or wolfram, together with kaolin, alumina, quartz, talc, and other rare earths or oxides, and the articles are specified as being available for beating bodies which need preliminary heating in order to make them conductive.

* See our issue for February 9, page 145, for a report of a previous hearing of the case.

MEETINGS.

FRIDAY, MARCH 8.
Architectural Association.—Special general meeting to consider the Committee's scheme for the establishment of day classes. 7.30 p.m.
Royal Institution.—Mr. W. A. Shenstone, F.R.S., on "Virrified Quartz." With experimental illustrations. 9 p.m.
Institution of Civil Engineers (Students' Meetings).—Mr. C. Johnston on "Sewage Treatment." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Professor T. Roger Smith on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions." 8 p.m.
Glasgow Architectural Craftsmen's Society.—Mr. J. Lochhead on "The Decay of Building Materials." 8 p.m.

SATURDAY, MARCH 9.

Royal Institution.—Right Hon. Lord Rayleigh on "Sound and Vibration." III. 3 p.m.
Institution of Junior Engineers.—Visit to the Southall Station of the Brentford Gas Company to inspect the carburetted gas plant, inclined retorts, &c. 3 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Beddington Sewage Farm. 3 p.m.
Dunedin Institute of Architecture.—Mr. C. G. Soutar on "Ecclesiastical Architecture in Fifeshire." With line-drawing illustrations. 7 p.m.
Edinburgh Architectural Association.—Visit to Archers' Hall and Craigmillar Park United Free Church. 3 p.m.

MONDAY, MARCH 11.

Surveyors' Institution.—Adjourned discussion on Mr. Thomas Blashill's paper on "The Present Condition of the Building Industry." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Ventilation, Warming, and Lighting." 7 p.m.
Society of Arts (Lectures).—Major Philip Cardew on "Electric Railways." I. 8 p.m.
Clerks of Works' Association (Carpenters' Hall, London Wall).—Monthly meeting. 7.30 p.m.
Bristol Society of Architects.—Mr. Archibald Dawney on "Constructional Steelwork as Applied to Building." 8 p.m.

TUESDAY, MARCH 12.

Institution of Civil Engineers.—Mr. J. Husband on "The Aesthetic Treatment of Bridge Structures." 8 p.m.
Society of Arts (Applied Art Section).—Mr. Hugh Stannus on "Some Examples of Romanesque Architecture in North Italy." Mr. T. G. Jackson, R.A., will preside. 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Calculations, Measurements, and Plans and Sections." 7 p.m.

WEDNESDAY, MARCH 13.

Architects' Benevolent Society.—Annual General Meeting of the Subscribers and Donors, in the Rooms of the Royal Institute (Lecture by the President, Mr. William Emerson, will take the chair at 5 o'clock).
Architectural Association Discussion Section.—Mr. H. P. G. Maule on "The Architect and the Garden." 8 p.m.
Sanitary Institute.—Dr. Christopher Childs, M.A., on "Ventilation: Success and Failures of the Methods at Present in Use." 8 p.m.
Society of Arts.—Mr. F. B. Behr on "The Proposed High-Speed 'Monorail' between Liverpool and Manchester." Sir William Preese will preside. 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Millbank Street Pumping Station of the London Hydraulic Power Company (assemble at the works, 51, Millbank Street, Westminster). 2.30 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Boake, Roberts, & Co.'s Chemical Works, Stratford. 2.30 p.m.
Institution of Sanitary Engineers (Incorporated).—Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m.; Sessional Meeting at 7 p.m.
Edinburgh Architectural Association.—Mr. J. M. Brydon on "The Work of Cockerell." 8 p.m.
Edinburgh Architectural Association.—Mr. J. Stuart Syme on "San Michel and his Work." 8 p.m.
Northern Architectural Association.—Annual meeting. 3 p.m.

THURSDAY, MARCH 14.

Carpenters' Hall, London Wall.—Mr. W. E. Riley on "Dwellings for the Working Classes." 8 p.m.
Royal Institution.—Professor Percy Gardner on "Greek and Roman Portrait Sculpture." III. 3 p.m.
Society of Arts (Indian Section).—Mr. H. J. Todd, A.C., on "The Growth and Trend of Indian Trade during Years' Survey." 4.30 p.m.
Institution of Architectural Engineers (at the Institution of Civil Engineers).—Mr. A. C. Eborall on "Polypphase Station Machinery." 8 p.m.
Sheffield Society of Architects and Surveyors.—Paper by Mr. E. W. Mountford. 7 p.m.

FRIDAY, MARCH 15.

Architectural Association.—Mr. H. B. Measures on Rowton Houses." 7.30 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Sanitary Appliances." 7 p.m.
Institution of Mechanical Engineers.—Mr. A. N. Bennett on "Combined Trolley and Conduit Tramway Systems." 8 p.m.

SATURDAY, MARCH 16.

Architectural Association.—Third Spring Visit to Lambrope House, Park-lane, W., by permission of the architect, Mr. W. H. Romayne-Walker. 2.30 p.m.
Royal Institution.—The Right Hon. Lord Rayleigh on "Sound and Vibration." IV. 3 p.m.
Incorporated Association of Municipal and County Engineers.—Home District Meeting, to be held at Mibleton.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

February 27.—By GERMAN & GERMAN (of Loughborough).
Normanton-on-Soar, Notts.—The Manor House Estate, 116 a. 2 r. 16 p. f., including the Manor (in lots) £10,948
February 22.—By HORNE & CO.
Walworth.—1, Hampton-st., with car-yard and stabling, 1 a. 6 1/2 a.; also a railway arch, u.t. 968 yds. f. 1,490
By JONES, LANG, & CO.
Kensington.—23 and 25, Kensington Park-rd., u.t. 61 yds., g.r. 304, r. 107, u.t. 855
By FRYER, SUREFIELD.
Bethnal Green.—24, Abery-st., u.t. 50 yds., g.r. 54, 708. 295
Canning Town.—4, Ford's Park-rd., u.t. 87 1/2 yds., 2 to 18 (even), St. Thomas's-rd., u.t. 97 1/2 yds., g.r. 374, 168. 1,020
Poplar.—60, Spey-st., u.t. 64 yds., g.r. 41. 285
Limehouse.—43, 45, and 47, Limehouse-cuseaway, f. 600
Plaistow.—Grange-rd., f.g.r. 124, reversion in 90 yrs. 270
129, 131, and 133, Pelly-rd., f. 675
Poplar.—79, Trelley-st., u.t. 41 yds., g.r. 27, 108. 170
February 23.—By BENTLEY & SONS (at Pontefract).
Kensall, Yorks.—Kensall House Farm, 114 a. o.r. 23 p. f. 5,150
Four closes of land, 14 a. 2 r. 21 p. f. 790
By WILSON & PHILLIPS (at Southend).
Southend-on-Sea, Essex.—53, Avenue-rd., u.t. 78 1/2 yds., g.r. 54, 88. 360
February 25.—By EASTMAN BROS.
Peckham.—87, Commercial-rd., u.t. 42 1/2 yds., g.r. 38, r. 211. 235
Commercial-rd., f.g.r. 151, 158, u.t. 42 1/2 yds., g.r. 64, 98. 130
Bexley Heath, Kent.—Lion-rd., Wye Lodge and 2 r. 23 p. f., r. 404. 580
By MESSRS. KEMSELEY.
Bow.—21 and 22, Merchant-st., f. r. 911. 1,045
Hackney.—102 and 103, Amhurst-rd., u.t. 65 1/2 yds., g.r. 142, 78, r. 904. 1,025
1 and 3, Greenwood-rd., u.t. 50 1/2 yds., g.r. 131, 88. 825
February 26.—By DEBENHAM, TEWSON, & CO.
Regent's Park.—4, York-gate, u.t. 201 yds., g.r. 401, r. 1602. 1,000
Kilburn.—23, Carlton-vale, u.t. 48 1/2 yds., g.r. 64, r. 661. 560
By FERRIS, PATER, & FURBER.
Newington.—77, Newington-cuseway, f. c.r. 1001. 1,335
By MOSS & JAMESON.
Kingston-on-Thames, Surrey.—14, 16, and 18, St. James's-rd., u.t. 56 yds., g.r. 121, 904. 900
By RUTLEY, SON, & VINE.
Tottenham Court-rd.—26, Tottenham-cd., f. 955
Hampstead-rd.—10, Rutland-st., f. 1,200
Holloway.—106, Devonshire-rd., u.t. 51 1/2 yds., g.r. 62, 68, r. 344. 370
Finchley.—24 and 26, Stanhope-rd., f. 480
By S. CLIFFORD TRE.
Forest Gate.—29, 31, 35, and 37, Sundry-rd., u.t. 82 1/2 yds., g.r. 40, 124, 126. 900
By ERICK, WARMAN.
Holloway.—129, Tollington Park, f. c.r. 604. 710
By J. C. PLATT (at Hammersmith).
Hammersmith.—38, Overstone-rd., u.t. 65 yds., g.r. 61, r. 401. 350
30, Illey-rd., u.t. 65 yds., g.r. 61, r. 344. 365
Shepherd's Bush.—59, Coningham-rd., u.t. 71 1/2 yds., g.r. 71, 70, 207, 104. 350
40 and 42, Wingate-rd., u.t. 42 1/2 yds., g.r. 144, r. 621. 600
304, Goldhawk-rd., u.t. 25 yds., g.r. 41, r. 401. 300
Chiswick.—468, High-rd., u.t. 701 yds., g.r. 61, 68, r. 32. 550
By ORGILL, MARKS, & LAWRENCE (at Messons' Hall Tavern).
Boscombe, Hants.—Christchurch-rd., the Palmerston Arms, p.h., u.t. 50 1/2 yds., r. 2501, with goodwill 16,680
February 27.—By JOHN BOTT & SON.
Horne Hill.—2 to 14 (even), Kestral-avenue, u.t. 64 yds., g.r. 631, 108, r. 3094. 3,000
By BRADSHAW BROWN & CO.
Poplar.—Bowley-st., freehold manufacturing premises, area 7,000 ft. r. 401. 1,900
By ELLIOTT, SON, & BOYTON.
New Oxford-st.—No. 60, u.t. 24 yds., g.r. 451, c.r. 2001. 1,970
Regent-st.—66, Northmore-st., u.t. 17 yds., g.r. 124, r. 1101. 885
By WALTER HALL.
City of London.—26, Moorgate-st., u.t. 15 1/2 yds., g.r. 214, 355. 1,660
Peckham.—Redman-st., f.g.r. 47 1/2, u.t. 43 yds., g.r. 121. 600
By R. TIDEY & SON.
Victoria Park.—20, 21, and 22, Hedgers-grove, u.t. 50 1/2 yds., g.r. 121, 128. 325
Haggerston.—27, 27 (odd), Dunstan-st., u.t. 18 yds., g.r. 251, 27 (odd). 755
28 to 44 (even), Dunstan-st., u.t. 18 yds., g.r. 261, 2 to 10 (even), Loandast-st., u.t. 18 yds., g.r. 121, 108. 1,480
30 to 45 (odd), Loandast-st., u.t. 18 yds., g.r. 121, 108. 745
40 to 56 (even), Loandast-st., u.t. 18 yds., g.r. 121, 108. 605
1770
Islington.—16, Elmore-st., u.t. 5 1/2 yds., g.r. 62, r. 371. 385
By WYATT & SONS (at Chichester).
Birdham, Sussex.—Oaklands Farm, 15 a. 3 r. 2 p. f. 580
Sidesham, Sussex.—A cottage and 10 a. o.r. 10 p. f. 420
A freehold house and 1 a. o.r. 30 p. f. 250
A freehold barn, stable, &c., and 0 a. 3 r. 14 p. 100
Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for annum; u.t. for unexpired term; p.a. for per annum; yds. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table with multiple columns listing materials such as Bricks, Hard Stocks, Rough Stocks, Grizzles, Smooth Bright Facing Stocks, Shipments, Flettons, Red Wire Cuts, Best Fareham Red, Best Red pressed, Ruabon Facing, Best Blue Pressed, Staffordshire, Do., Bullnose, Best Stonebridge, Fire Bricks, GLAZED BRICKS, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two, Two Sides and one, Ends, Splays, Chamfered, Squints, Best Dipped Salt Glazed Stretchers and Headers, Quoins, Bullnose, and Flats, Double Stretchers, Double Headers, One Side and two, Two Sides and one, Ends, Splays, Chamfered, Squints, Seconds, Quality White and Dipped Salt Glazed, Thames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Lias Lime, NOTE.—The cement and lime is exclusive of the ordinary charge for sacks, Grey Stone Lime, 13s. 6d. per yard, delivered, Stourbridge Fire-clay in sacks, 28s. 6d. per ton at rly. dpt., STONE, Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Grinshill, Crown Portland in blocks, Darley Dale in blocks, Red Corshill, Red Mansfield, Hard York in blocks, Hard York 6 in. sawn bolts, sizes 5 d. (under 40 ft. sup.), 2 8 per ft. super. at rly. dpt., 6 in. Rubbed Ditto, 3 in. sawn bolts, sizes 5 d. slabs (random sizes), 3 in. self-faced Ditto, SLATES, in. in., 20x10 best blue Bangor, 11 5 0 per 1000 of 1200 country dep., best seconds, 11 15 0, 16x8 best, 10x10 best blue Portman, 10x10 best blue Portman, 16x8 best blue Portmadoc, 16x8, 20x10 Permanent green, 16x8, TILES, Best plain red roofing tiles, 41 6 per 1,000 at rly. depdt., Hip and valley tiles, 48 6 per 1,000, Hip and valley tiles, 4 0 per doz., Best Ruabon Red, brown or brindled Do. (Edwards) 57 6 per 1,000, Do. ornamental Do., 60 0 per doz., Hip tiles, 10 10 0, Valley tiles, 3 9 11, Best Red or Mottled Staf. fordshire Do. (Peakes), 50 9 per 1,000, Hip tiles, 4 1 per doz., Valley tiles, 3 8 11, WOOD, BUILDING WOOD.—YELLOW, At per standard, Deals: best 3 in. by 11 in. and 4 in. 4 8 d., 4 8 d., by 6 in. and 11 in. 16 10 0, 16 10 0, Deals: best 3 by 9 14 0 0, 15 10 0, Battens: best 2 1/2 in. by 7 in. and 8 in. 12 10 0, 13 10 0, and 3 in. by 7 in. and 8 in. 10 10 0, 10 10 0, Battens: best 2 1/2 by 6 and 3 by 6 10 0 0, 7 in. and 8 in., Deals: seconds, 1 0 0 less than Battens: seconds, 0 10 0, Fir Timber: Best middling Danish or Memel (average specification) 4 10 0, 5 0 0, Seconds, 4 5 0, 4 10 0, Small timber (6 in. to 10 in.) 3 12 6, 3 15 0, Swedish balks, 2 15 0, 3 0 0, [See also page 251.]

CONTRACTS AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Table with columns: Nature of Work or Materials, By whom Required, Forms of Tender, &c., Supplied by, and Tenders to be delivered. Lists various construction projects across different regions like Barking, Glasgow, and London.

PUBLIC APPOINTMENTS.

Table with columns: Nature of Appointment, By whom Advertised, Salary, and Application to be in. Lists positions such as Clerk of Works, Road Ganger, and Building Inspector.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xlii. Public Appointments, pp. xx. & xlii.

1800

1800

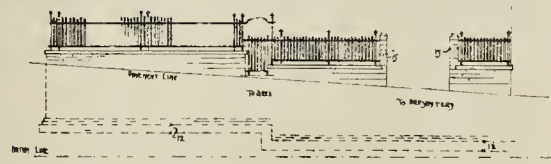
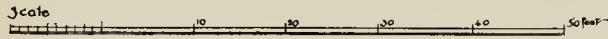
1800

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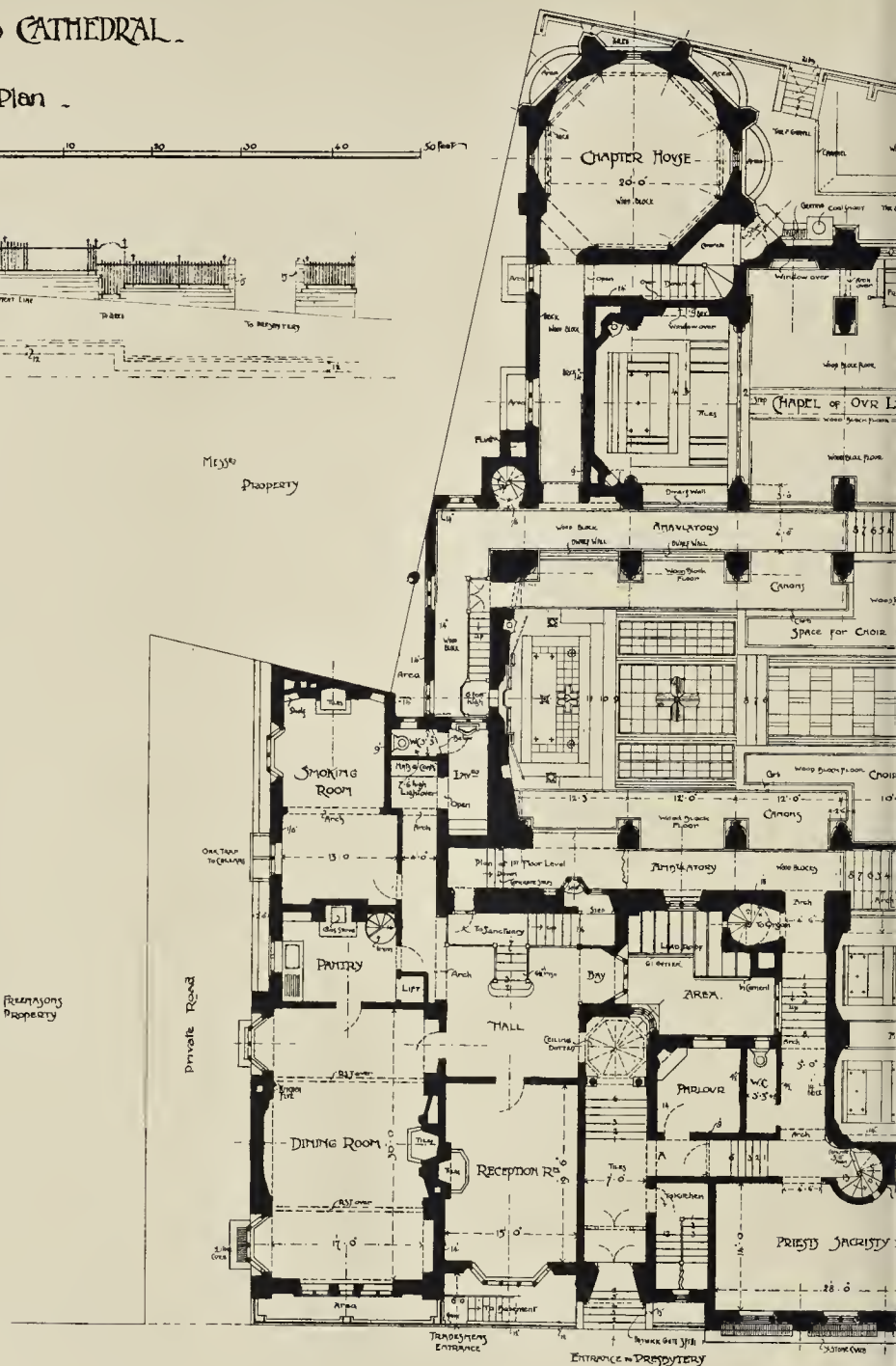
ST ANNES CATHEDRAL LEEDS - Ground Plan .



Messrs
Property

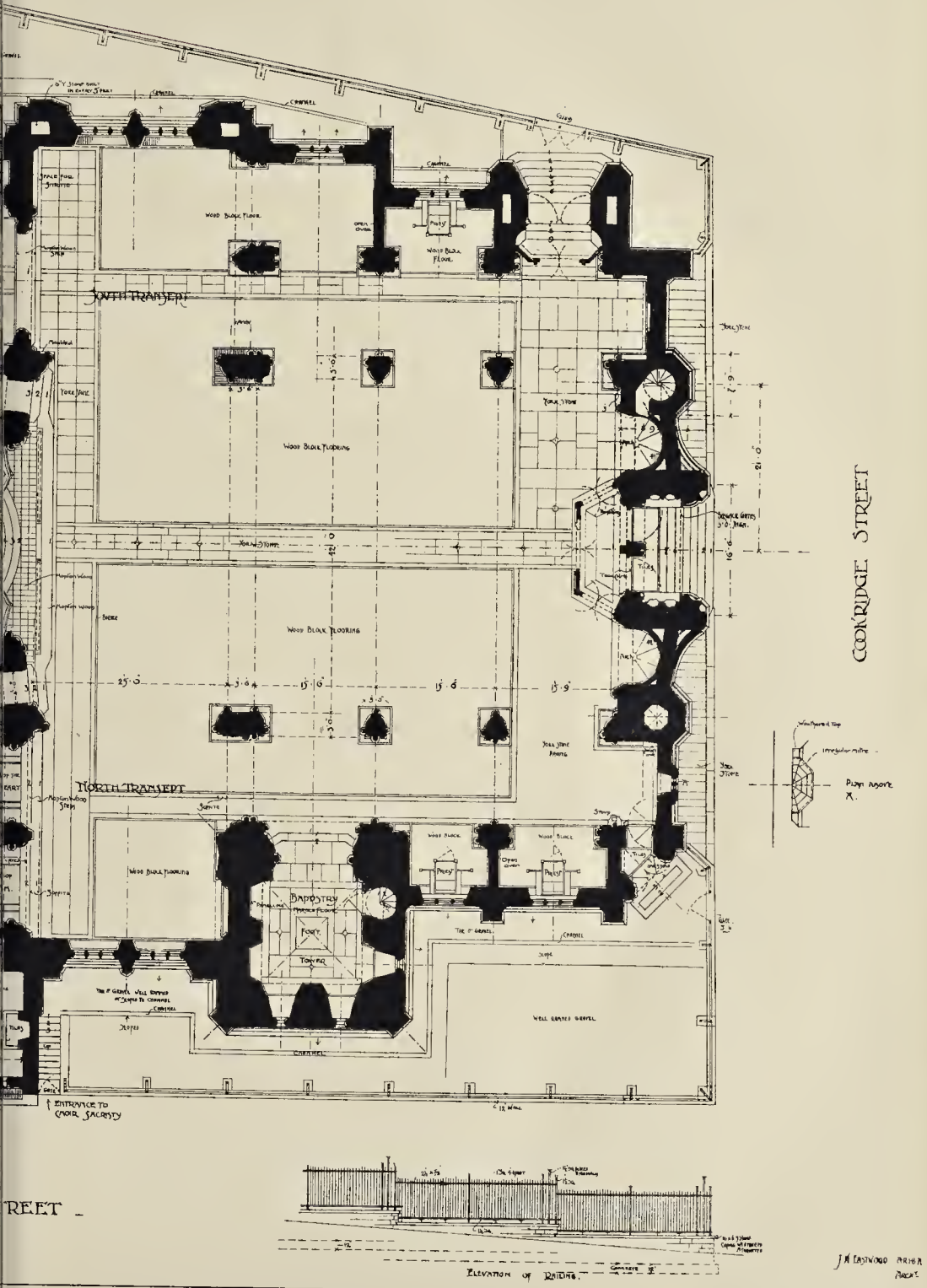
Brunsons
Property

Private Road



GEORGE

ST ANN STREET



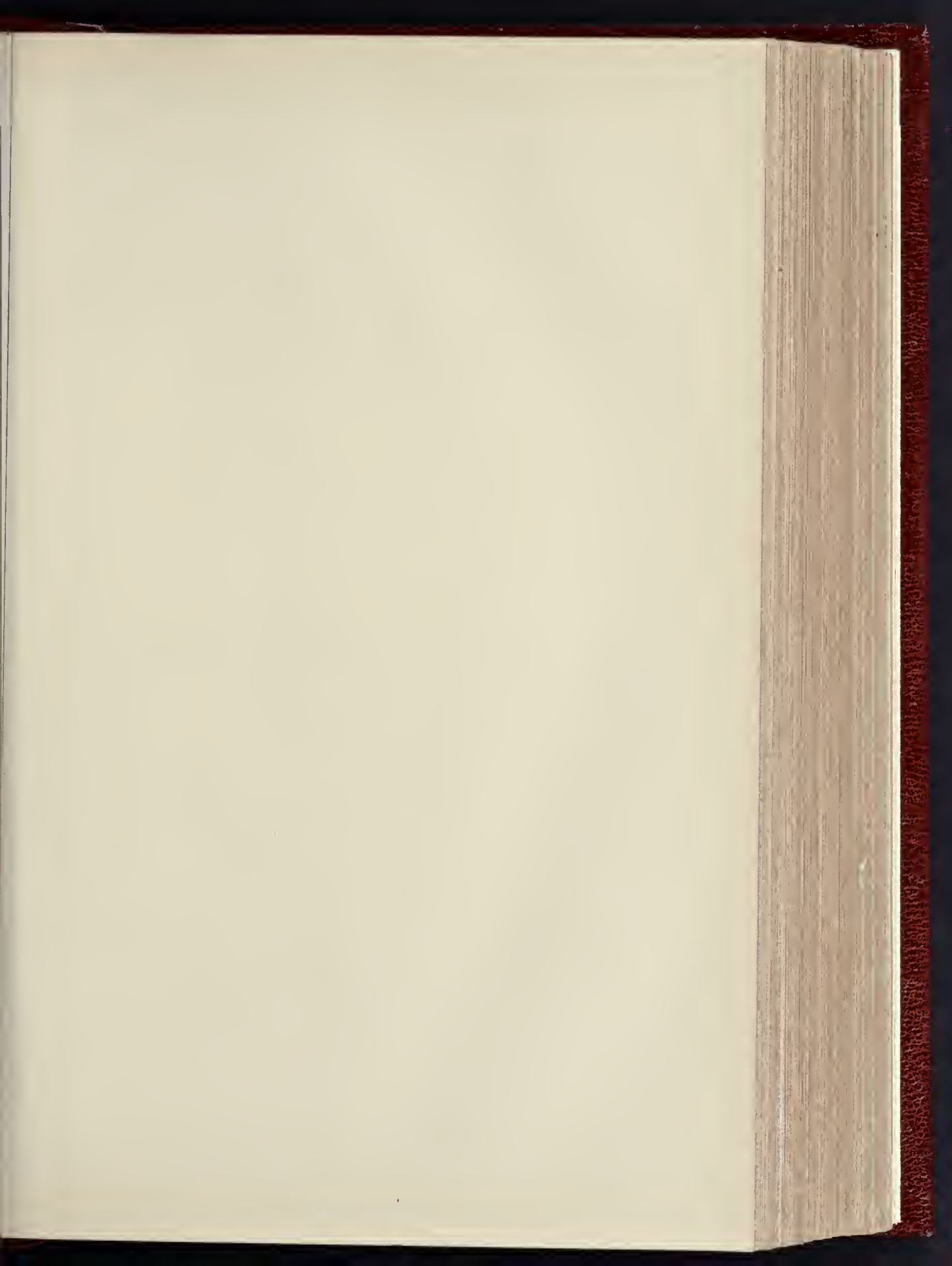
CONRIDGE STREET

REET

ELEVATION OF CHOIR

J. H. EASTWOOD ARCHT. DRAWN

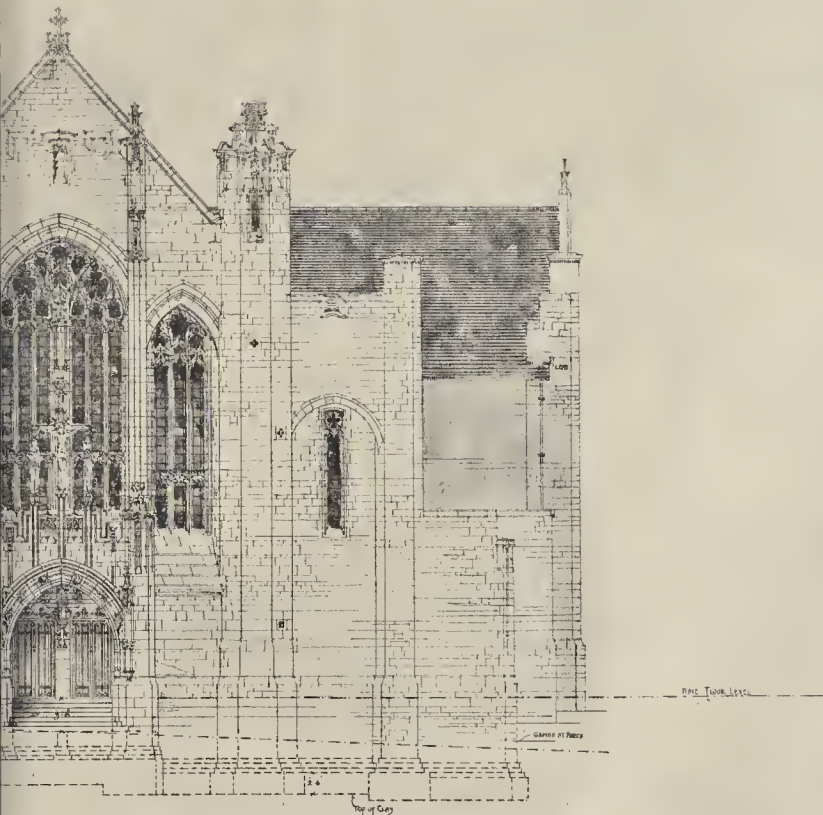
PHOTO-LITHO. SPRADUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



STANLEY CATHEDRAL.
LEEDS -
West Elevation

Scale 0 10 20 feet

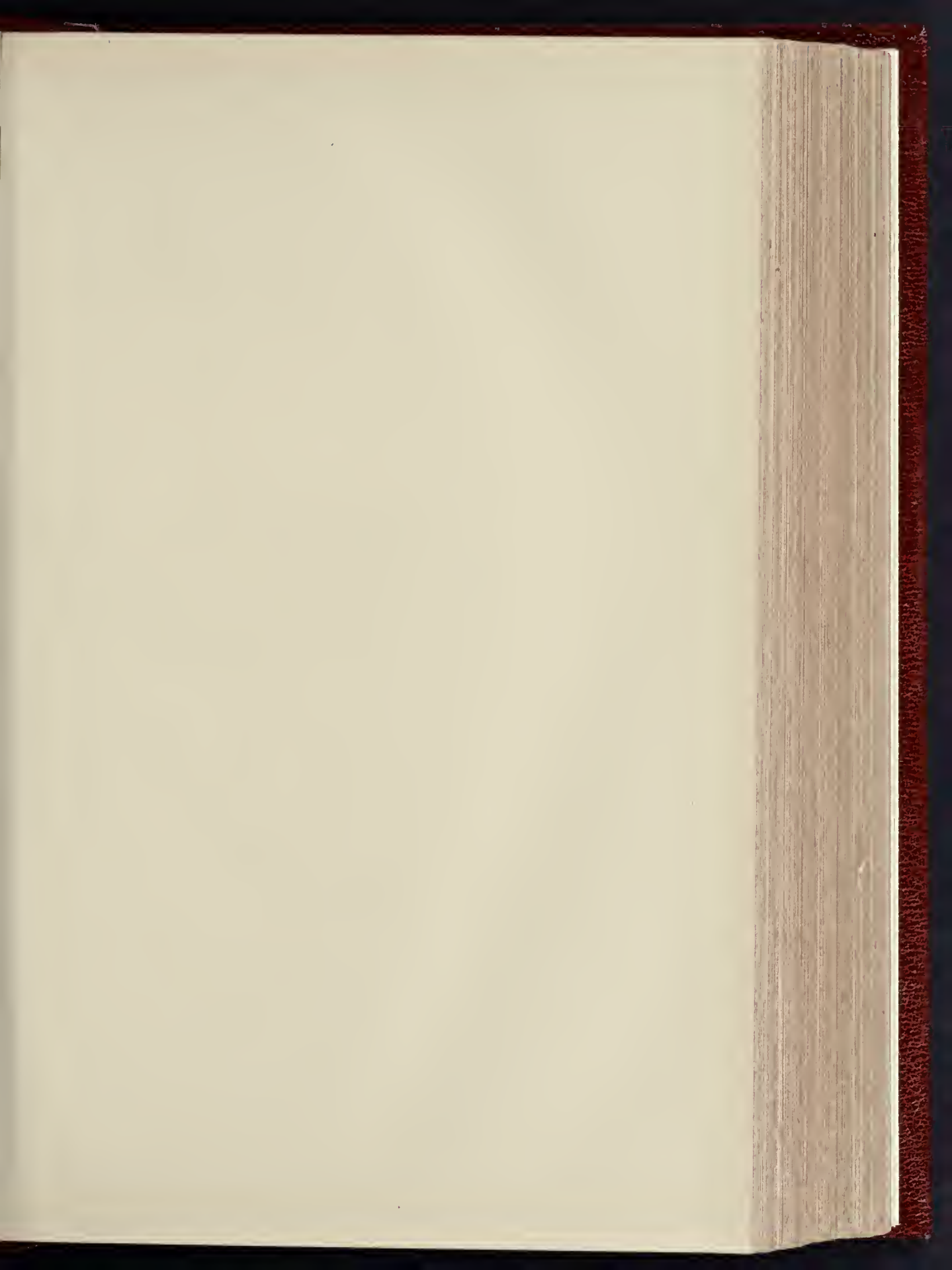




SECTION THROUGH CHURCH ST

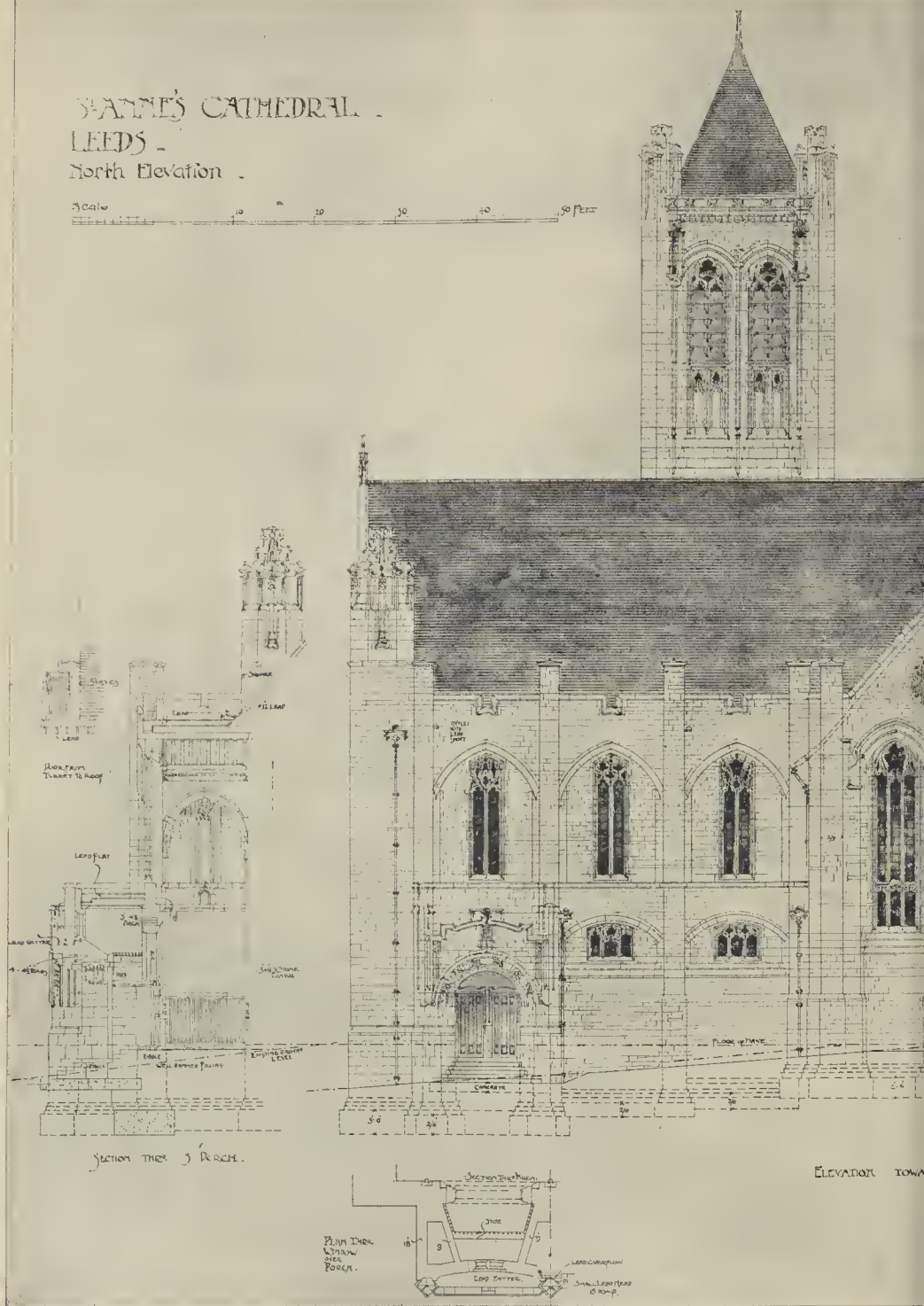
J. H. EASTWOOD A.R.I.B.A.
DRAWN

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



ST. ANNE'S CATHEDRAL LEEDS - North Elevation -

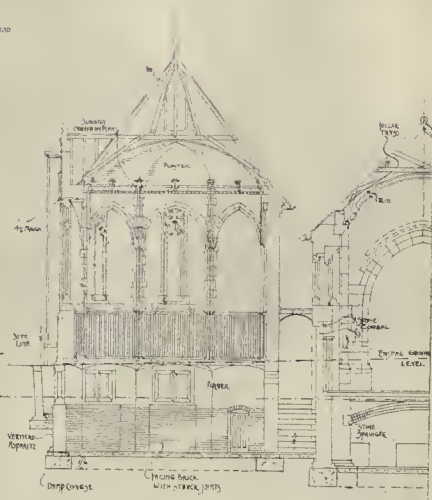
Scale 0 10 20 30 40 50 FEET





WEST END

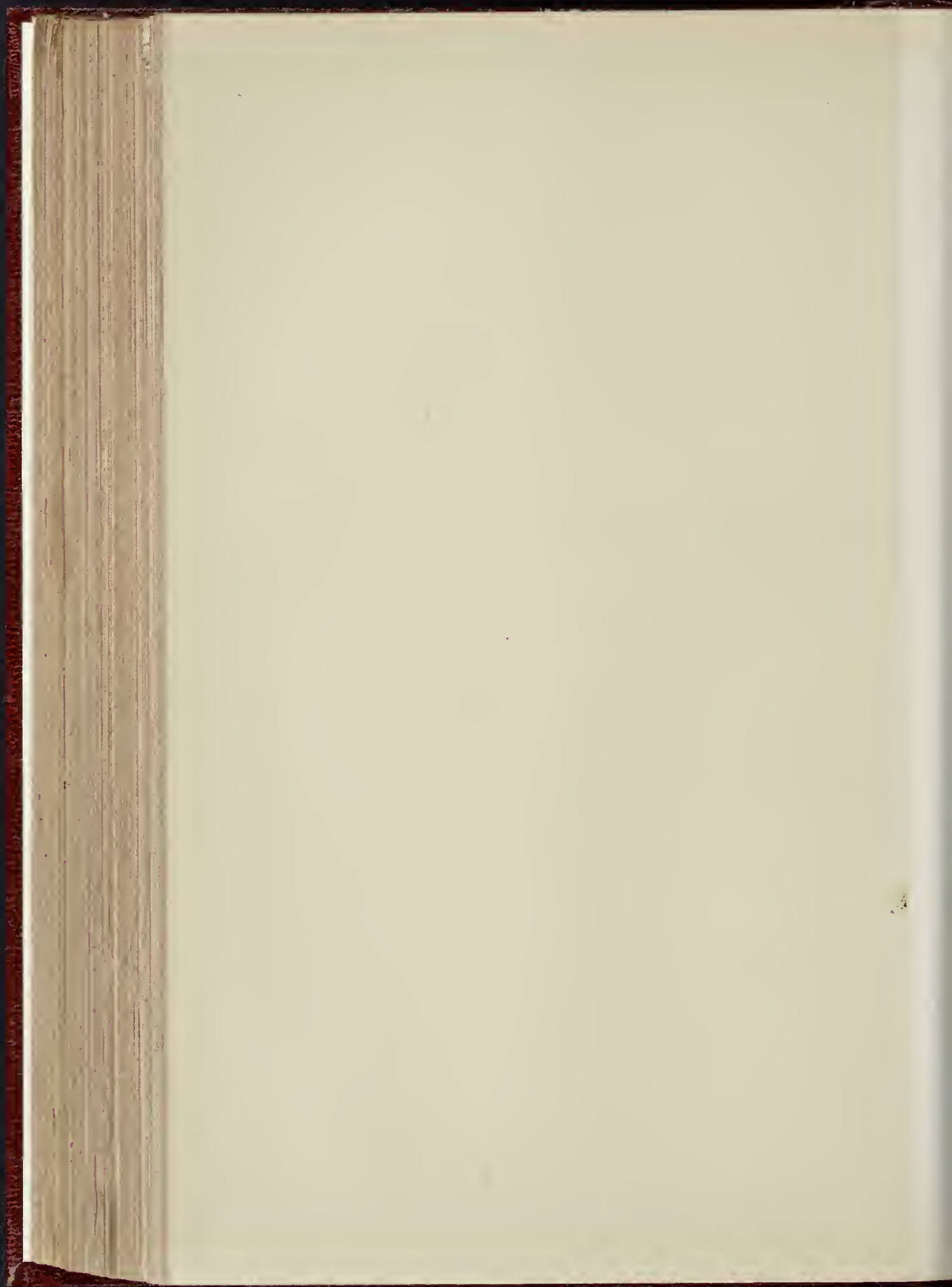
CHAPTER HOUSE



SECTION THRU CHAPTER HOUSE

J. H. EASTWOOD ARCHT.
1892

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



ngly picturesque objects, though smaller and less costly in appearance than many others in the case. Among the most characteristic objects in this case are also the two small and rather squat German cups, Nos. 21 and 26; low wide cups each on a shallow moulded circular foot. A large oval dish—Spanish, late seventeenth century—sent by her late Majesty, is one of the examples which show that richness of surface embossing and chasing will not atone for bad form: the whole design is ragged in outline. We may notice also that in the cup No. 38, the figure of an armed warrior makes a very weak stem, quite out of keeping with the scale of the cup; besides which, a figure should never be introduced here it must be used as a handle for the grasp of the hand; it is degrading the figure to use it in that manner.

With case L we come to some of the ecclesiastical designs, in which we find, almost for the first time in the collection, architectural forms frankly used in silver work. It shows how the cathedral forms of architecture had become synonymous with the notion of religious art, that we so constantly find them used in articles which are specially intended for religious use. Thus in case I we find a "censer of architectural design," on a hexagonal plan, with buttresses and pinnacles at each angle; a late fourteenth century English work. No form of design could be more unsuited for a swinging censer; it looks as if it must come to pieces in use. A less unfitting use of architectural detail is found in the fine chalice, No. 8 in the same case; a longitudinal gabled form, with heavy angle brackets perched on the top of foliated capitals in a manner which would never have been tolerated in actual built architecture. This is nevertheless a fine piece of work of the kind (French, of the fourteenth century); it is worth noting that the scroll design on the slope of what would in actual architecture be the roof is far too large in pattern, quite out of scale with the rest of the design. Case M contains a remarkable German cup of architectural design, the stem consisting of elaborate tabernacle work, exceedingly bad to handle; it is noticeable though not noticed in the catalogue, that we have an example of the especially German vice of apparent penetration; the upper portion of the finial, above the cup, is designed so as to appear like a continuation of the stem carried through the middle of the cup. Nothing could be in worse taste, though the workmanship is admirable. In the same case, assorted oddly with the medieval work, are the two or three examples in the connexion of Classic work; a Greco-Roman cantharos (6), a libation cup of pure Classic form, assumed to be of the work of the fourth century B.C., and of excellent preservation; a little Græco-Roman model amphora; and a very beautiful little nude statuette of Apollo, probably Gallo-Roman. A Flemish chalice is another of the elaborate architectural designs, with a stem so delicate in its detail that one would be afraid of grasping for fear of injuring the work. In case N are several monstrances, in which architectural forms are largely used; a German one (5) is remarkable for the fine and distinctive manner in which miniature window-dressery is made use of; and an Italian example (No. 12) is interesting for the

manner in which the feeling and detail of Italian Gothic are reproduced on a small scale. There are two more architectural censers, as unsuitable for their purpose as the one previously mentioned; and a rather simple chalice (10) notable for the charming and unusual manner in which a little crucifix in relief is introduced on one of the lobes of the spreading base, the remainder of which is quite plain. This little incident gives quite a special interest to the work.

Among the remaining exhibits we have only space to notice two or three. One of these is the splendid nautilus cup of German work lent by her late Majesty, with a figure of Jupiter above and a figure of Neptune on a sea-horse supporting the cup, a splendid piece of work much more Italian than German in general feeling (date 1600); and, in Case O, a bowl of Venetian Gothic work of the fifteenth century, with a design formed of radiating scallops in ogee curves, enriched with foliated ornaments and animals, and which is a perfect model of style for silver-smith's work. It is stated to have been found in one of the canals of Venice. Another work in Case R, which should not be passed over, is an exceedingly fine reliquary cross, described as "French or German circa 1340," with the peculiarity of a double arm to the cross, one above the other; the bold and effective plan of the base, and indeed the whole design, are in the highest style of art.

We have merely touched on some of the salient points in this splendid collection, which every one interested in decorative art should see. Owing to the liberality of the committee and members, access to it is easy for all who care for the subject.

NOTES.

It seems to be intended, as might have been expected, that an important monument to our late beloved Queen should be raised somewhere in London, though it has not transpired that any special site or any special idea in regard to the form of the monument has been proposed. It is to be hoped that whatever is done will be done in a manner that shall be artistically worthy of the nation and of the occasion. We must expect to find that various absurd proposals will be made by people who have pet theories to promote; and already that irrepressible person, Mr. Shaw-Lefevre, has attempted to revive the idea of a modern Gothic chapel attached to Westminster Abbey, which has been condemned over and over again. What we ought to have is a great architectural and sculptural monument, for which there should be a competition open to all British artists.

ON every governing body, municipal or imperial, there must be progressives and anti-progressives, and when the progressives temper progress with prudence, they form the party to be supported. The Progressives on the London County Council have—as is natural—made mistakes, but they are earnestly bent on improving the condition of the Metropolis, and they bring to the work a lively enthusiasm. Every one, therefore, who desires to see London improved should be gratified at the result of the recent election. The attempt of the so-called Moderates to confuse imperial

and municipal questions was ill-advised and deserved to fail. The English people have always been in favour of steady progress; they kept that aim in view in politics till all the great political grievances were removed. The democracy of London for a long time has not known its strength in municipal matters, and has not understood what it wanted. Now it has, after some years' newspaper reading, come to the conclusion it wants the water supply in its own hands, and it wants better locomotion. It has been so often told that London is behind-hand that it has decided to get something done. Having thus made up its mind, London was certain to vote for the Progressives. If the Government thwart the wishes of London, it is equally certain that in no long time the Metropolis will return Liberal members to Parliament.

SIR COURTENAY BOYLE presided at a Board of Trade inquiry at the Westminster Town Hall, on the 1st inst., to consider the question of whether electric light companies are to be allowed to raise the pressure of supply without the consent of the consumer. The action of the Westminster Company, in applying that the proviso in one of the Board of Trade regulations, which insists that the consent of the consumer must be obtained, should be altered so as to allow the question being settled by an arbitrator appointed by the Board of Trade, led to this inquiry. Mr. Balfour Browne pointed out that the Westminster Company had divided their gains with the consumers without pressure from the London County Council or the Board of Trade. There were only eight clients of the company who preferred the 100 volts, notwithstanding that they were charged 8d. a unit as against an average charge of 4d. for the rest of the consumers. This necessitated a double set of mains and put the company to great expense. It would be for the benefit of the great bulk of their clients if the eight low-pressure consumers would agree to change over. The various opposing counsel, representing the City Corporation, County Council, &c., submitted that the Board of Trade could not alter this regulation, as it was not a regulation at all. The right of existing consumers to a 100-volt supply could not be altered without their consent except by an Act of Parliament. Sir Courtenay Boyle decided that this inquiry might discuss whether it was expedient for the Board of Trade to alter this regulation. Technical evidence of a one-sided character having been given in support of the alteration, the inquiry was adjourned to this week. In our opinion this inquiry would never have been necessary at all if the supply companies had approached their consumers with more consideration in the first instance. Having in many instances simply tricked their consumers into accepting the higher voltage without any reduction in their tariff, and having made wild assertions about increased efficiency, no danger of shock, &c., they now pose as much injured bodies because a few consumers are willing to pay exorbitantly for the more desirable lower pressure.

THE adjourned discussion on Mr. Madgen's paper on "The Electrical Power Bills of 1900" at the Institution of Electrical Engineers

last week gave rise to an unexpectedly interesting debate. Mr. Hammond criticised the paper very severely. He pointed out that the questions that really concerned the Institution of Electrical Engineers were those connected with the proper size of the distributing stations and the best methods of distributing power, and not those connected with certain real or imaginary restrictions on "free trade" in electricity. Mr. Madgen's paper was a dirge, and the Institution would be ill-advised in appointing a committee to make the path of the company promoter easier. If we were behind other nations in electric lighting, it was not due to restrictive legislation, but simply to the keen competition that was going on with cheap gas. Electric lighting in this country had often to compete with gas at 2s. per 1,000 cubic feet, whilst on the Continent and in America the average price of gas was three or four times as great. He pointed out that in this country municipalities were, as a rule, supplying electricity to consumers at a much cheaper rate than companies. He also mentioned the excellent municipal electric-lighting stations there were in Germany. Professor Ayrton gave his experience of one of the new power companies. He had advised a small town in the North to get its electricity in bulk from this company instead of laying down a station of its own. The company, however, refused to supply at a cheaper rate than 3d. a unit, which was obviously prohibitive. This statement of Professor Ayrton's is an exceedingly serious one, and Mr. Madgen, in his reply, accentuated it by saying that he thought the company ought to have charged 6d. a unit. Several directors and promoters of various power schemes spoke strongly against what they called the "dog in the manger" policy of municipalities, and the general feeling of the somewhat sparsely attended meeting was obviously with them.

AN appeal is made for subscriptions towards a sum of 150,000*l.* in completion of the endowment and equipment of Owens College, of which the first jubilee will be celebrated in the course of the current year. The Committee, of which the Duke of Devonshire is Chairman, desire to establish new Chairs of Architecture, English Literature, and Hebrew, to provide for hygienical and bacteriological investigation, for research fellowships, and for a pension fund on behalf of the professorial and general staffs. It is stated that an immediate sum of 20,000*l.* is needed for the extinction of existing liabilities, more particularly in respect of the medical side of the college, and that at present the yearly income fails to meet the annual expenditure. Owens College, which was founded in 1846 by John Owens, a Manchester merchant who devised nearly 100,000*l.* to trustees for the establishment of a teaching University (being the first after its kind in the provinces), and was opened in 1851 in a house that had formerly been the residence of Richard Cobden. Some twenty years afterwards the college migrated to the new buildings erected from the designs and plans of Mr. Alfred Waterhouse, R.A., and since enlarged by Messrs. Alfred Waterhouse & Son. In 1867 the capital of the foundation was increased by contributions to a total of about 400,000*l.*, and in 1880 a charter of incorporation was granted for the

establishment of Victoria University, to consist of affiliated colleges having their centre at Manchester. With Owens College has been amalgamated the Royal School of Medicine, founded in 1824; Dr. J. Prince Lee, first Bishop of the diocese, bequeathed his library, containing upwards of 6,000 volumes, and to the buildings have been removed the library of the Medical Society and scientific collections from the Manchester Museum.

IN the course of next month will be offered for sale at the Mart the Crown lease of No. 4 Whitehall-gardens. The house was erected for Sir Robert Peel from the plans and designs of Sir Robert Smirke, who was the architect also of Peel's country seat at Drayton-Bassett, near Tamworth, where the portrait gallery, added at the south-eastern corner of the house, was completed in 1846, after the designs of Sydney Smirke (see the *Builder*, May 10, 1845). It was at Whitehall-gardens that Sir Robert Peel formed the fine collection of Dutch, Flemish, and English pictures, comprising paintings by Rembrandt, Vandyck, Teniers, I. and A. Ostade, A. and W. Van der Velde, Lely, Reynolds, Sir Thomas Lawrence, and Wilkie, together with portrait busts of Pope, Prior, Sir Walter Scott (by Chantrey), &c., the greater portion of which was dispersed at auction last year.

WE learn that this house, Hogarth's House, which stands on the west side of Hogarth-lane, is about to be pulled down for the erection of villa residences upon the site, including the garden. The house, having been for some time previously out of repair and rented in tenements, was taken in 1890 by the Typographic Etching Company, for the Hogarth Works. In the following year an attempt was made to collect a sum of 500*l.* for the establishment of a maintenance trust, and to clear away some buildings that had been intruded on the south side. The house was built in the earlier years of the eighteenth century, of red brick with rubbed brick dressings, and has a bold wooden bay-window on the first floor of the north and principal front, with a moulded wooden eaves course (see the view in the *Builder* of February 8, 1890). Hogarth bought the house in or about 1750, after he returned from his visit to Calais. He occupied it as a summer residence until his death on October 26, 1774, in Leicester Fields. He left the house to his widow, who demised it to her relative, Mrs. Mary Lewis, at whose death in 1803 it passed to some persons named in Mrs. Hogarth's will. The house was subsequently occupied by Henry Cary, the translator of Dante, who died in 1844. It is said that the two leaden urns upon the gateposts were given to Hogarth by Garrick.

At a meeting of the Fine Arts Society on Thursday, February 28, a lecture was delivered by Mr. F. H. Evans on Southwell Minster, illustrated by limelight views from original photographs. The lecturer briefly outlined the history of the Minster, and strongly condemned the more recent alterations, which, in the case of the introduction of the organ, have hidden much beautiful detail, and

spoiled the interior effect. Of the large number of carefully-selected photos that were put upon the screen, those of the Norman work throughout the church were exceedingly interesting, showing variety of feeling and individuality, of which the caps now hidden behind the organ are particularly charming specimens, unique in their archaic character. Mr. Evans has also secured a splendid collection of details from the rood-screen, a beautiful example of Late Decorated work. Mr. Doran Webb, who was in the chair, at the close of the lecture emphasised the necessity of suppressing the modern tendency to give undue prominence to the organ as a feature. With this we quite agree where it is an old church or cathedral that is under consideration, but in the case of modern church design the organ is so important a factor that it should be an essential part of the design, not a mere incident to be pushed from sight.

THE ARCHITECTURAL ASSOCIATION THE PARIS EXHIBITION, 1900.

THE ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 1, Conduit-street, Regent-street, the President, Mr. W. H. Seth-Smith, presiding.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association, Messrs. D. Hill and A. Gilbert Scott.

On the motion of the Chairman, a vote of thanks was accorded to Mr. R. C. Harrison presenting to the library forty volumes of *Builder*.

The Chairman said he would like to recommend members of the special general meeting, to be held that day week, for the purpose of considering a scheme of proposed day classes for the Association. No doubt a good deal of interest would be felt in regard to the Committee's proposals, and there would be a meeting on the occasion.

The Chairman then announced that A. H. Hart's lectures on "The Architect's U. Colour" would commence on March 13. The subject was one of considerable interest to architects, and any gentleman desirous of joining should send in his name to the Secretary at once.

The Chairman then called on Mr. E. W. Wonnacott, the Cates Prize-man, to read a paper on "The Paris Exhibition, 1900," illustrated by a large number of lantern slides, as well as a number of drawings hung round the room.

Mr. Wonnacott, in the course of some preliminary observations, said he would like to explain that last year a travelling student was offered for the study of the building, the Paris Exhibition of 1900, and it was Mr. Arthur Cates, the father of the professor, if he might call him so, that the Association owed a debt of gratitude in offering studentship, and for his generosity in handing over to the treasurer the funds necessary for the purpose. The Committee of the Association was charged with finding a suitable candidate, on certain conditions which he recalled, except one, viz., that the person chosen must read a paper on the subject of his visit before the Association. The Committee's choice having fallen on him, he stood before them in fulfilment of the conditions imposed.

Mr. Wonnacott then read the following paper:—

Historical.—Every eleventh year France since 1855, has invited the nations to come and vie with her in the great industrial show initiated. The Exhibition of last year, long foreseen, but it nevertheless was decided on in a hurry, for Berlin had intended to do the century with a magnificent universal exhibition there, but France, ever jealous of her door neighbour, sailed in a point near the wind, and bespoke the date mentioned. A formal decree settled everything. France to have the next Exhibition. Whichever nation it was that was to have the honour of holding the international show, there was the opportunity of closing in a magnificent way, a century of artistic, scientific, and commercial

PRICES CURRENT (Continued).

WOOD. At per load of 50 ft. L s. d. £ s. d. Pitch pine timber (35 ft. average).. JOINERS' Wood. White Sea: First yellow deals, 3 in. by 11 in. Battsens, 2 1/2 in. and 3 in. by 7 in. Second yellow deals, 3 in. by 11 in. Third yellow deals, 3 in. by 11 in. Petersburg: first yellow deals, 3 in. by 11 in. Do. 3 in. by 9 in. Battsens, 2 1/2 in. and 3 in. by 7 in. Second yellow deals, 3 in. by 11 in. Do. 3 in. by 9 in. Battsens, 2 1/2 in. and 3 in. by 7 in. Third yellow deals, 3 in. by 11 in. Do. 3 in. by 9 in. Battsens, 2 1/2 in. and 3 in. by 7 in. White Sea and Petersburg: First white deals, 3 in. by 11 in. Battsens, 2 1/2 in. and 3 in. by 7 in. Second white deals 3 in. by 11 in. Pitch pine: deals Under 2 in. thick extra Yellow Pine: First regular sizes Broad (2 1/2 in. and up) Oddments Seconds, regular sizes Yellow fine Oddments Kauri Pine: Planks, per ft. cube Danzig and Stettin Oak Logs Large, per ft. cube Small Wainscot Oak Log Dry Wainscot Oak, per ft. sup. as inch do. Dry Mahogany: Honduras, Tabasco, per ft. sup. as inch Selected, Figury, per ft. sup. as inch Dry Walnut, American, per ft. sup. as inch Teak, per load American Whitewood Planks Per ft. cube.

JOISTS, GIRDERS, &c. In London, or delivered to Railway Vans, per ton. Rolled Steel Joists, ordinary sections Compound Girders Angles, Tees and Channels, ordinary sections Fitch Plates Cast Iron Columns and Stanchions including ordinary patterns

METALS. Per ton, in London. L s. d. £ s. d. Common Bars Staffordshire Cream Bars good merchant quality Staffordshire "Marked Bars" Mild Steel Bars Hoop Iron, best price ("And upwards, according to size and gauge.") Sheet Iron, Black Ordinary sizes to 20 g. 11 0 0 11 0 0 11 0 0 11 0 0 Sheet Iron, Galvanised, flat, ordinary quality. Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. 13 0 0 13 0 0 13 0 0 13 0 0 Sheet Iron, galvanised, flat, best quality. Ordinary sizes to 20 g. 17 0 0 17 0 0 17 0 0 17 0 0 Galvanised Corrugated Sheets. Ordinary sizes, 6 ft. to 8 ft. 20 g. 13 0 0 13 0 0 13 0 0 13 0 0 Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker 13 0 0 13 0 0 13 0 0 13 0 0 Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.) Lead—Sheet, English, 3 lbs. & up. Pipe in coils Soil Pipe Zinc—Sheet Vieille Montagne 6 0 0 6 0 0 25 0 0 COPPER Strong Sheet per lb. Thin Copper nails Brass Strong Sheet Thin English Ingots SOLDER—Plumbers' Timmer's Blowpipe

PRICES CURRENT (Continued).

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TO CORRESPONDENTS.

W. B. M.—W. E. P. (Amounts should have been stated). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out hooks and giving addresses. Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £200, unless in some exceptional cases and for special reasons.] * Denotes accepted. † Denotes provisionally accepted.

ABERDEEN (Mon.).—For the erection of school buildings, &c., for the Aberysth School Board. Mr. R. L. Roberts, architect, Victoria Chambers, Aberdeen. Quantities by architect:— A. G. Howell £6,570 0 0 W. E. Willis £5,777 0 0 C. H. Reed " 6,500 0 0 Caen Bros " 5,700 0 0 J. Morgan " 6,287 0 0 Thomas & Son 5,998 0 0 D. Lewis " 5,975 0 0 Evans & Bros. 5,653 2 3 A. P. Williams " J. Jenkins " 5,535 0 0 Aberlilly " 5,860 0 0 W. Britten " 5,270 0 0 Bagley & Co. 5,807 12 0

ASHFORD (Middlesex).—For the erection of new Board schools at Clarendon-road, for the Ashford School Board. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, London, E.C. Quantities by Messrs. Fleetwood, Son, & Eversden:— Foster Bros. £7,182 J. Cricknell " £7,034 Cooper & Son " 7,398 R. & L. Tonge " 7,000 Butcher & Hendry " 7,263 Kingler & Sons " 6,987 Gray Hill " 7,264 Meason & Son " 6,972 Sydney Knight " 7,246 Drowley & Co. " 6,988 Rooms & Co. " 7,200 H. Emmett " 6,978 Martin Wells & Co. " 7,199 E. Chamberlain " 6,825 J. Appleby " 7,177 Wisdom, Isleworth " 6,820 H. & B. Hansom " 7,067

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CAMBORNE.—For residence at Camborne, Cornwall, for Mr. J. M. Holman. Mr. Sampson Hill, architect, Redruth:— For House, Joinery. J. Collier " 3,640 8 15 Turner & Tronson " 4,440 J. Glasson " 3,660 6 20 W. J. Wion " 3,547 6 73 Hodge & Mitchell " 2,922 5 40 John Odgers, Redruth " 2,812 5 54

CHURCH (Lancs).—For the construction of a sewer, Tappin-road to Church Bridge, for the Urban District Council. Mr. W. E. Wood, surveyor, District Council Offices, Church. Quantities by surveyor:— J. Grimshaw, Church, * as per schedule.

DOVER.—For supplying and laying water mains in Tower Hamlets and Folkestone-road, for the Town Council. Mr. H. E. Stigges, C.E., Town Hall, Dover:— Biggs, Wall, & Co. " £780 0 9 L. H. Green, " " 574 18 11 Dartford " 570 0 0 [Surveyor's estimate, £690.]

EASTBOURNE.—For the erection of an electric lighting station, Roselands, for the Corporation. Mr. R. M. Cloyne, C.E., Town Hall, Eastbourne. Quantities by Borough Engineer:— Johnson & Son, 90, High Cross-street, Leicester " £9,100

EAST RETFORD.—For the supply of a 12-hp compound steam-roller for the Rural District Council. Mr. T. Henry, surveyor:— C. D. Phillips " £497 10 0 Aveling & Porter " 490 0 0 Fowler & Co. " 12 0 0 Marshall, Sons & Co., Ltd. " 475 0 0 Burrell's, Ltd. " 421 0 0

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FEATHERSTONE (Yorks).—For the execution of road works, Post Office-road and Gladstone-street, for the Urban District Council. Mr. F. B. Rothera, surveyor, Council Offices, Featherstone:— Both Streets. T. Cook Starkey £535 18 2 Harrison & Barra " W. Waddington 442 6 6 clough " £255 3 6 J. W. Broadhead 319 0 0 R. W. Ibbotson 250 7 0 M. Hall " 309 12 10 Gladstone-street. G. Clements, Featherstone " £127 4 9 Post Office-road. H. Burns, Featherstone " £94 3 6

FERNHURST (Sussex).—For the erection of school buildings, for the School Board. Mr. James Hill, architect:— Chas. Bridger £380 13 2 Fredk. Gale " £280 0 0 W. Harding " 385 0 0 B. Slade, Fernhurst " 345 0 0 hurst " 279 0 0

GLASGOW.—For the construction, erection, and fitting of a jeweller's and silversmith's stand at the Glasgow Exhibition, site only. Mr. Ernest E. Feich, architect, 20, John-street, Adelphi, W.C.:— Scott Bros. " £1,234 Sumner & Co. " £533 Hill & Egginton " 765 Harris & Sheldon " 518 Orr & Son " 571

HALIFAX.—For the erection of a warehouse, &c., Francis-street. Messrs. J. Drake & Son, architects, (Queensbury):— Masonry (amended tender)—Robinson & Sons, Halifax " £703 17 Joinery—J. Thompson, Halifax " 308 0 0 Slating—Bancroft & Son, Halifax " 73 10 0 Plastering—Bancroft & Son, Halifax " 46 15 11 Plumbing—F. Lucas, Halifax " 147 13 11 Painting—Varley & Robson, Thornton " 10 13 Ironwork.—Roberts & Co., Ltd, Bradford " 169 10

HOVE (Sussex).—For the execution of wood-paving works (7,576 yards super.) Holland-road, &c. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove:— Griffiths & Co., Ltd., Hamilton House, Bishops-gate-street Without, London, E.C. £9,435

LONDON.—For alterations and additions, &c., to Sadlers' Wells Theatre, Rosebery-avenue, E.C. Mr. Bertie Crewe, architect, Savoy House, W.C. Quantities by Mr. H. E. Pollard, 6, York's Buildings, Adelphi, W.C.:

Table with columns: Contractor, Alterations, Painting. Includes Antill & Co., Johnson & Co., Holson, Andrews, Veale, Pitcher, Weisking & Sons, etc.

MANSFIELD.—For making-up Duke-street for the Corporation. Mr. R. F. Vallance, Borough Surveyor, White Hart Chambers, Mansfield:— Vallance & Blythe £1,030 0 Lane & Son £757 15 W. H. Cliffe 910 11 J. Gros Greenwood Mansfield 741 0 Fisher Bros. 995 0 W. A. Vallance 818 0

MIDDLETON (Lancs).—For the erection of new stone and four cottages at Parkfield, Middleton, for Middleton Co-operative Society. Mr. F. W. Dixon, architect, Trevelyan Buildings, Manchester, and Union-street, Oldham:— Ogdin & Holland £3,687 C. Alderson £2,966 R. Robertson 3,650 Farrington & Son 1,975 W. Pollitt 3,974 J. Grundy Sons & Co. 2,960 J. Simpson 2,985 Jackson & Sons 2,815 R. Ridings 2,982

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PRESTON.—For extension to police-station buildings, Lancaster-road and Earl-street. Mr. Thomas Cookson, Borough Surveyor and Engineer:— John Christian £8,770 0 M. Shorrocks £8,276 11 r Charles Walker 8,527 15 0 Topping Bros. 8,250 0 T. & R. Colley 8,487 15 0 F. Hill 8,167 14 0 W. Whiteside 8,452 4 2 W. Hothersall 3,163 0 0 T. B. Barnett 8,420 0 0 W. Bradshaw 8,163 11 1 John Baines 8,391 10 7 Cartmell & Son 8,157 6 0 T. Livesey 8,325 0 0 Croft & Sons 7,925 0 0 F. A. Baines 8,310 0 0 [Surveyor's estimate, £8,300.]

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LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

Recommended for acceptance. CANTERBURY ROAD.—Improvements (Boys' and girls' departments).—Providing new staircases, cloakrooms, and lavatories; also boys' teachers' room; extending classroom A to accommodate 60; re-dividing and re-stepping classrooms B, C, and D; providing new drainage scheme, new fittings for water closets, new boiler-room, and low pressure hot-water apparatus, improving lighting of junior mixed school. Revised accommodation: boys, 268; girls, 268; infants, 387; total, 923. Loss of 16 places:— Lawrence & Sons £5,795 Johnson & Co., Ltd. £6,398 Bullard & Co. 6,619 W. Downs 6,992 F. & H. F. Higgs 6,531 Holliday & Greenwood 5,997 Lorden & Son 6,505 W. Smith 5,838 Garrett & Son 6,376 J. Appleby 5,978 Marsland & Sons 6,335

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PLASSY-ROAD (Enlargement).—Extending existing low-pressure hot-water apparatus to six new classrooms:— Morris & Co. £223 0 Wenham & Waters, J. Grundy 220 0 Ltd. 1,185 0 Wintner, Smith, Gray, & Co. 209 0 Ltd. 182 0 G. & E. Bradley 186 10 Duffield & Sons 157 0

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The Builder.

VOL. LXXX.—No. 3029.

MARCH 16, 1901.

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Designs for Wall Papers.—By Mr. C. H. B. Quennell	Single-Page Ink-Photo.

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The Architectural Association Day Classes Scheme.



THE scheme for day classes in architecture which has been drawn up by a committee of the Architectural Association, and which was formally accepted at a special meeting of the Association, reported on another page of this issue, is a very important move in architectural education in this country, and one which may have far-reaching effects. In its efforts to improve the opportunities of education for architectural students the Association has been for many years going on to wider and wider schemes. Its evening classes were in themselves an elaborate institution, which has been a great success in a qualitative if not in a quantitative sense; the numbers attending have not we believe been so large as might have been hoped, but probably all the members of the Association who have joined these classes will testify that they have received great benefit from them; and the question may now be asked, are these evening classes, some of which necessarily treat the same subjects which must be prominent in the work of the day classes, likely to be continued concurrently with the day classes? or will they suffer by the institution of the day classes?

The two sets of classes do not, it must be pointed out, stand on exactly the same footing in regard to architectural education. The evening classes may be considered as being supplementary to the apprenticeship system; they are to give to pupils articled in architects' offices the opportunity of studying various branches of architectural design and construction in a more systematic way than they could be studied in an office, even under the best intentioned and most conscientious principal. They are classes, therefore, concurrent with pupilage. The day classes, on the other hand, are intended

to be classes preparatory to pupilage. The promoters of the scheme, while they do not deny that the knowledge and experience to be acquired by an articled pupil in the routine of office work is indispensable, and such as no other kind of training can supply, take the view (in which we entirely concur) that the student will be much better able to get the best advantage from the routine of actual work in an office if he has previously gone through a systematic study of the elements of architecture, and learned also the use of drawing instruments. He will also in that case be a much more useful person in the office than he could otherwise become till he had been at least two years in it; and the principal or the older assistants, as one speaker pointed out at the meeting, will be saved the interruption to their work from having to show the new-fledged pupil the elementary use of the tools of his trade. There is moreover the great advantage to the student, that before signing articles and committing his parents or guardians to a considerable expense and himself to a career, he will have had the opportunity of discovering whether he likes architectural work and has any ability for it, at no further cost than that of the fees for one or two terms at the Association's day classes. There will be an advantage both to principal and pupil. The general acceptance of the day classes by those who think of becoming architects will entirely modify the terms of pupilage, and the wisest thing for the principal, when asked to take a pupil, will be to say—as one eminent architect states his intention to say in the future—"Let him go through a year's course of the Architectural Association classes first, and then we will see."

It seems to us that such an institution, so obviously supplying a need in our system (or should we say no-system?) of architectural education, cannot fail to be a success; indeed, we should expect that there would almost be a rush to join these classes—to which, however, it must be remembered, a student is not to be eligible without some form of written recommendation. The question is,

whether it would be necessary or desirable to carry on the evening classes concurrently with the day classes; whether this would not involve a waste of effort. There is no question that there will never be such good work done at an evening class as at a day class. An evening class in its nature is a supplement to the ordinary day's work, and is entered upon after the mind has been to some extent drawn upon and fatigued by the work of the day. And Mr. Slater, speaking at the meeting already referred to, remarked that there was much less inclination to evening work now than twenty years ago; that the tendency was to spend more time in recreation and on subjects alien to one's professional study. That is the case, and to some extent it indicates a decline in energy, an inclination to take life more easily, which we fear is rather on the increase. But so far as this dislike to evening work means an increased attention to health and to the relaxation which is essential to health, it is an improvement. The greatest professional acquirements attained by unintermittent study will be of little value to a man, if he has not the health to exercise them to the best advantage, or to enable him to enjoy his life, and therefore it is possible that a disinclination to evening studies, if it exists, is not altogether unwise; at all events, they should not be incessant, and these considerations point to the probability that the Architectural Association day classes, if (as we fully expect) they become an established success, will at all events modify the scheme of the evening classes. The best conclusion would probably be this—that the day classes should be regarded as concerned only with those things which directly bear upon architectural design and architectural practice, and which a student intending to put himself into harness in an architect's office, must or ought to know; and that the evening classes should be kept up for the study of those branches of work connected with architecture, but not so entirely indispensable, which a man may desire to study to increase the range of his proficiency. Under this head might come, for instance,

such subjects as hygiene, land surveying, water-colour, colour design, modelling, &c.; subjects which are already carried on in the evening classes, and to which more time might then be given. In addition to this there may be the opportunity for setting up a life class for figure-drawing among the evening classes, which would be a most valuable addition to the scheme of instruction. Such subjects as elementary construction and physics, the history of architecture, elementary design, &c., would be better delivered over entirely to the day classes. Otherwise it is likely there will be a waste of effort.

And what are to be the subjects taught in these preliminary day classes, which are to be preparatory to the office engagement of the student? They are given in the report of the Association meeting in another column, and we turned to them with some interest, to see what was considered to be the true line of study in preparation for entry into an architectural office. No attempt has been made to shadow forth, in the curriculum, any new or out-of-the-way theory of architecture; and this is right. Whether or not we think that some of the ordinarily accepted routine as to architectural studies needs revising, it is clear that the attempt to institute a new series of classes for architectural study is no occasion for any such reform; it would be very hazardous; one must be content to furnish students with that programme of instruction which is, for the present, matter of common consent and agreement. "The use of instruments and scales" comes properly as the first item in the programme, and its prominence seems almost like an intentional protest against the views of those who assert that drawing has nothing to do with architecture. In a sense, no doubt, it is true that architecture is not drawing; but drawing is a necessary means towards properly planning and constructing a modern building; and the fact is that many persons have got into the habit, in England, of making architectural drawings much less precise and careful than they ought to be, for the proper carrying out of a complicated modern structure. The drawing instruments are the tools with which the modern architect has got to work; let the student begin by learning how to use them, and let him not despise them. Architectural and engineering drawing instruments are beautiful implements in themselves, and a man who uses them clumsily will be likely to be clumsy in more serious matters also. "Freehand drawing" naturally follows, and we presume that will be taught on the strictest and severest lines, to develop the capacity of drawing difficult and delicate curves with ease and precision. "The O of Giotto" is a lesson in art training as significant now as it ever was. Then follows "The Five Orders of Classic Architecture." We can fancy some critics raising their eyebrows at that, and asking, "Are we never going to get rid of the Orders?" We do not say that is not a question to be asked; but we have to recognise the fact that we have not got rid of them yet; and though the architects of the immediate future may be disposed to treat them with a great deal more freedom than was the case in the past, in order to treat them with freedom it is essential to have an accurate knowledge of them as a basis to start from. It must not

be forgotten, besides, that the study of the Orders in their original scholastic precision of detail is one of the most valuable means of training the eye in the perception of scale and proportion. All things considered, we do not see how the Orders can be omitted for the present from any scheme of architectural education.

"The elements of the various styles of architecture" is a somewhat vaguely expressed item in the programme. One is tempted to ask—Which styles? and what are we to understand by their "elements?" There are various quite recognisable styles of architecture which are nevertheless not worth inserting in an elementary educational curriculum. "The principles of mechanics" and "elementary construction" are of course all right; nor have we any objection to make to the courses of lectures on architectural history. The sooner architectural students get a general knowledge of the history of their art, the better will they be able to understand and to place, as one may say, the details which they learn to draw, and which are all inevitably dependent on something that has gone before. We observe, however, that nothing is said, in either the first or second year's course, about either drainage or ventilation. Much there is in regard to these subjects which can only be learned by actual experience with buildings; but surely elementary knowledge in regard to them should form part of a preparatory training.

Mr. Stratton's criticism, that perspective should have been put in the first year's course, is also not without point. During the vacation of three months students would probably employ themselves partly in sketching; and no sketching can be carried on in any satisfactory manner without a knowledge of the general principle of perspective representation. Without that, a sketcher does not really appreciate the meaning of the forms he sees, nor their relation to the lines which he can put upon paper to represent them. Such refinements as scientific sciography, as well as the more complicated problems of perspective, are properly relegated to the second year's course; but the main principle of perspective should be part of the first year's course, though it should not be surrounded with the mysteries of complicated diagrams which are calculated to frighten students away from it as too difficult a subject. The main principle of perspective is really an exceedingly simple thing, often made quite unnecessarily puzzling by teachers and instruction books, which bewilder the student with a number of detailed problems instead of confining his attention to the principle, which is the same in all cases, and can be illustrated as well in a simple as in a complicated diagram.

The really important difficulty for the Architectural Association lies in the question of adequate premises for carrying on a scheme which in fact is a very ambitious one. They have gone on the principle that it is best to start at once with the opportunities at hand, instead of waiting for new premises; the promoters of the scheme point out that the premises are there all day, in their hands and rented, but little used; and that they thus have the economic advantage of having rooms ready for their use to start with, without entering at once on any fresh expenditure. This is true, but on the other hand those

most favourably disposed to the scheme cannot but see that, if it is to be a success on any such scale as to make it worth carrying on, the present premises must be regarded as quite inadequate, not only in regard to space but in regard to dignity of position and entrance, for an institution which is professing to provide a preparatory school for entrance to a great profession. It appears to be hoped that the school itself will materially assist in furnishing funds for the erection of new premises. We fear it will be a good while before it realises funds on a sufficiently large scale to afford any very substantial assistance towards an adequate building; and as far as we can gather them, it seems to us that the views of the promoters in regard to the necessary extent and cost of any building which would be at all worth erecting, or at all worthy of the importance of the object, are very much too limited. We should suggest that the true course would be not to wait till the funds accruing from the working of the school, together with the promises of subscriptions here and there, had amounted to a fund adequate for the purpose—which would probably mean waiting an indefinite time but to borrow capital for the erection of an adequate building at once, and repay it out of the working of the school. It is quite certain that such a school of architectural training cannot have the necessary dignity of *entourage*, cannot be regarded as adequately or suitably housed, in the present premises of the Architectural Association.

THE ÆSTHETIC TREATMENT OF BRIDGES.



THE announcement of a paper to be read at the Institution of Civil Engineers on "The Æsthetic Treatment of Bridge Structures" was certainly something new—we doubt such a paper has been read to that assembly before; and it was not less surprising to find that it was to be read by an engineer. Having gone through Mr. Husband's paper carefully, along with the diagrams attached to it, we can only congratulate him heartily on an essay which is throughout admirably reasoned, and in which, as far as the general opinions expressed are concerned, there is hardly anything said with which architects for the most part will not fully concur. Some of the types of bridges illustrated which are selected for commendation may not appear to us to be very beautiful; in these matters reasoning is one thing, graphic illustration is another; and it is possible to have a structure which illustrates the sound principles without being in itself beautiful. But in his statement as to the objects which should be kept in view, as far as appearance is concerned, in the designing of large bridges, Mr. Husband shows a degree of perception which is certainly not often found among engineers; and though the engineering profession in general refuse to listen to the opinions of architects on the subject of design, or to attach any weight to them, it is to be hoped that they will listen when they have words of wisdom addressed to them by an Associate member of their own representative body.

We give on another page a *résumé* of the paper as furnished by the Institution.

having read the paper in full, we may here remark on one or two of the points in it which seem worth special attention.

The author divides his subject into three heads—masonry bridges, iron bridges, and those in which masonry and iron are used in combination. In regard to the purely masonry bridge, he points out that the use of a moulded architrave on a large span bridge has the effect of reducing scale by using a kind of detail habitually associated with arches of a smaller scale, and that the megalithic character of a bridge is better asserted by depending simply on the arrangement of the voussoirs and spandrel masonry. In like manner, the employment of the niche as a means of doing something with the face of a pier, even where no sculpture is intended and where the niche is far too large in scale for any but colossal sculpture, is in reality a false employment of an architectural feature proper to a different scale and to a different class of structure. The treatment of the piers in moulded panels, as in the Grosvenor bridge at Chester, we quite agree with him in repudiating; it is treating monumental structure like a piece of furniture. In regard to the design of the piers of a bridge Mr. Husband has a passage on the frequent use of columnar forms as ornaments in this portion of the structure which so well put that it is worth while to quote *verbatim* :—

"A few words may here be said regarding the use of classical pillars or pediments on this portion of the structure. The pillar is essentially a weight-bearing member, and in order to show to the best advantage, this feature should be given due emphasis. Its employment, generally as a fairly massively proportioned member, for the superstructure on the cut-water of a bridge is seldom successful, since at the most its supporting function is limited merely carrying the weight of a short entablature mounted by the parapet. Added to this the use of the pillar in classical architecture is so generally associated with repetition—pillars being usually grouped to form colonnades in which four is the minimum number employed—that the sight of a pair of columns or a single detached pillar upon the face of a pier gives rise to a suggestion of strangeness and isolation. For these reasons London bridges may perhaps be regarded as of higher æsthetic value than Waterloo Bridge. Were it advisable to employ a columnar design for the cut-water itself, the result would be much more satisfactory, since the pillars might then be suitably grouped and have superimposed upon them a considerable mass of masonry, thus calling into play the significance of their essential function. In the same way the pediment being so intimately associated with temple architecture, its adoption is often greater solecism than that of the pillar."

On one point in reference to masonry bridges, however, we must differ from him, viz. in his approval of the common system of building a cut-water on the downstream side of a pier as well as on the upstream side. He defends this on the ground of symmetry; we consider it is giving up one means of imparting character to a bridge, by letting the general form of the pier be frankly influenced by actual circumstances by the run of the water in which it is built. It is absurd to build a pier as if the water ran both ways, when we know that it can under no circumstances do so except a tidal estuary.

Bridges entirely of iron, or rather steel, include, as the author observes, all the very largest span bridges, many of which are on such a scale that anything like the applica-

tion of ornamental treatment becomes economically impossible.

"In these structures not only would the addition of ornament be false in principle, as being foreign to the purposes of design, but its systematic application could only be indulged in at the expense of a great increase in weight with a corresponding sacrifice of economy. From these considerations it is plain that the standard of æsthetic criticism to be adopted depends, firstly, upon the most perfect economic application of material, and secondly, in cases where distinctly optional design is possible, upon the adoption of the most pleasing outline consistent with economy. It has repeatedly been urged that these erections as a class are amongst the least æsthetic ever designed by man. That this scathing judgment may be true of a few isolated examples in which the essential principles of æsthetic construction have, apparently through sheer ignorance, been totally neglected, is not denied; but such a sweeping statement can only be the result of an appeal to standards as false as the verdict is unfair."

In the case of structures like cantilever and suspension bridges, where the working parts of the structure are frankly and nakedly shown, the structure itself is sufficient to give interest to the eye, and is its own best apology. There are some very good remarks on cantilever bridges, and especially on the falsity of the attempts which have been made in one or two instances to disguise the break between the cantilever and the horizontal span by giving a curve to the upper members of the cantilevers and continuing this curve through the upper member of the horizontal span; thus falsifying the structure, destroying its character, and sacrificing economy of material. In regard to suspension bridges, the author mentions, but with no expression of opinion, the method of stiffening the chain adopted in the shore spans of the Tower Bridge (he does not quote this example), by forming them in the shape of fish-bellied hanging girders. We regard this method as very ugly, losing all the natural beauty of the catenary curve; and the stiffening of the roadway can be just as well or better effected by a suspended horizontal stiffening girder. In regard to the piers of metal structures Mr. Husband speaks so well and forcibly that we are again tempted to quote his own words :—

"Although this section of the paper treats of structures built entirely of metal, yet it may be remarked that the kind of pier adopted for a suspension bridge is a matter of primary influence as regards æsthetic appearance, and those examples which are supported by masonry piers are, in general, far superior to those carried on piers of iron or steel. Considering those cases in which metal piers have been employed, their adoption cannot be said to have achieved any decided success. In many examples the design consists of an iron or steel tower, presenting some resemblance to a masonry structure. This is undoubtedly one of the most fatal errors into which the designer can fall. Attempts to repeat, in a plated and riveted structure, the outward form of a masonry arch, as is the case with the piers of the Tay Bridge, or to copy in iron that which in stone is eminently suitable for the propylon of an Egyptian temple, as has been done in more than one notable instance for the towers of suspension bridges, can only result in dire failure. It is possible, whilst viewing such structures from a considerable distance, to coerce the mind into a belief that they are actually of stone, as their form would suggest; but closer acquaintance robs them of all semblance of propriety. It is much preferable in lofty piers of iron or steel to adhere to some suitably-braced design removed as far as possible from the suggestion of a masonry prototype."

We can only hope that engineers who listened to these words will profit by them

In speaking of the class of bridges which combine steel with masonry, Mr. Husband is, we think, a little under a misapprehension in regard to the Alexandre III. Bridge, of which he speaks with much admiration, but observes that the masonry pedestals at its approaches are a little too high for so flat an arch, and "are situated too far in the rear of the visible recipients of the thrust; their position, in fact, scarcely renders them liable to criticism as a legitimate part of the structure." They are not meant to be regarded as a part of the structure. It must be remembered that the Alexandre III. Bridge is essentially a kind of festal or triumphal bridge, and the flanking piers with their sculpture are put there simply for glory, not for any suggestion of use; they were to give a pompous appearance to the entry of the bridge, and are no more utilitarian features than is a triumphal arch. The Alexandre III. Bridge might really have been more properly classed as one of the metal structures; it is true that it has masonry counterforts on the banks, but so has the Forth Bridge—not exactly counterforts, for that is not their function, but anchoring blocks, besides a granite approach bridge.

In connexion with the whole subject, however, we may point out that the best reasoning on the subject of the æsthetics of engineering design will be to very little purpose unless engineers will make up their minds to make it part of their education to study the design and the meaning of architectural and decorative detail, so as to train the eye to appreciate the distinction between good and bad detail, and to understand the real meaning of architectural forms and thereby at least avoid their misapplication in such a way as to be unmeaning and absurd. Reasoning alone on such questions will not suffice; they are matters of perception, which is not to be developed without a special training to that end.

NOTES.

THE discussion in the House of Lords last week on the Housing Question was singularly disappointing. There was a hope that Lord Salisbury would enunciate some kind of policy on the subject, but he left things exactly where they were. The result of the discussion is to magnify at once the demands and the difficulties of the question. If the Prime Minister can only point out difficulties, what chance is there of any scheme being carried out? That the subject is one most troublesome to deal with cannot be questioned, and it is doubtful if any number of Acts of Parliament will do more than modify the difficulties of the problem. The unfortunate part of the matter at the present time is that Ministers and Members tell us that no subject so immediately demands attention, thereby raising public expectation, and then when the question is brought forward in Parliament no remedy is suggested. As we have said over and over again, the subject is so complex, so variable, and so continually growing, that it can never be cleared away, as some sanguine persons would seem to think. But that is no reason why the Cabinet should not either formulate some scheme, or if it has not the will or capacity to do so, then keep silence—admit the difficulty of the problem and the impossibility of solving it

It is clear from the case of *Sadgrove v. Hole*, decided last week by the Court of Appeal, that if a building owner writes to a builder pointing out errors in an architect's plans or a quantity surveyor's measurements, it is a privileged communication. But it is equally clear that care must be taken as to the manner of communication, and that to send such complaints by a post-card so that all the world may read them may take away the privilege. "He had no doubt," said Lord Justice Collins, "that it was within the right of the defendant to communicate with the builder on the matter in question, and therefore as between the defendant and the builder the occasion was privileged. That privilege covered the libel, unless there was what he might call a superfluous publication to any person other than the builder to whose knowledge the post-card might be brought." In the present case the odd thing was that the plaintiff was a clerk in the architect's employment who was responsible for the quantities. He was not even named on the card, which merely stated that there were great mistakes in the quantities. That being so, the Court held that there was no publication as regarded the plaintiff. That, however, is a point of much less importance than the general proposition laid down as to privilege and as to publication as between the building-owner and the builder. It is a little difficult to see why in the present case the plaintiff went to law at all. However, he has been the means of eliciting from the Court of Appeal a decidedly interesting decision.

In a general leading article on various legal cases in the *Times* of Monday last, reference is made to a decision of the Court of Appeal to the effect that an architect employed by a building owner and authorised, as usual, by the compact to give final and conclusive certificates, is in the position of an arbitrator and not liable for negligence. Commenting on this, the *Times* observes:—"It speaks volumes for the general confidence in the architects of the country that everybody puts himself at their mercy without practical redress if they are careless as judges or arbitrators in giving their certificates." This kind of recognition of architects is something new for the *Times*. Better late than never.

MR. O'GORMAN read an abstract of his paper on the insulation of electric lighting cables to the Institution of Electrical Engineers last week. When we consider that of the capital expended on electrical schemes at least half is on the cables, it will be seen that the subject is one of the greatest importance to the industry. Mr. O'Gorman's paper is of somewhat unequal merit; it contains a few brilliant suggestions, some useful tables, some indifferent calculations and formulæ, and a great deal of compiled matter from foreign technical journals. It will probably occupy about one hundred pages of the *Journal*, but could most advantageously have been cut down at least fifty per cent. He quotes almost in its entirety a paper on cables, communicated by Mr. Swinburne to the Engineering Conference two years ago. This paper gives a few empirical calculations and an exceedingly doubtful formula, which

Mr. O'Gorman seemed to appreciate highly. The main conclusion to be drawn from the paper is that, with cables for high-pressure alternating currents, attention has to be paid not only to the specific insulation of the insulating material, but also to the dielectric strength and the dielectric capacity. He showed a striking experiment, illustrating how when the electric pressure between two conductors suspended in air was very high, introducing a piece of glass between them increased the "potential gradient" of the air and caused an arc to start between them. He suggested rightly, we think, that the "potential gradient" measures the liability of an insulating material to break down under electric stress, and suggested that the layers of insulating material in concentric cables should be graded so that the disruptive stress might be the same at every point. In the subsequent discussion Mr. Swinburne stated that the insulation of a cable was more a matter for experiment than for calculation. He had found that the paper called "butter-skin," in which butter is wrapped, had a high inductive capacity, and he had used it for making alternating current condensers.

AT the meeting of the Church Sanitary Association last week a resolution was passed in favour of inculcating "the Christian obligation" of pure air and water, abundant light, and wholesome surroundings. We trust that this Association will not be satisfied with good resolutions, but will endeavour to get its members to do practical work in their parishes, and will bring to the country clergy especially the knowledge of the great opportunities which they have of improving the sanitary condition of English villages. A country clergyman knows, as a rule, more of the sanitary condition generally of his district than any other person. He visits the poor and sees the interior of their dwellings. If he will bring to the notice of the Local Authority sanitary defects, he may do an immense amount of good. It may be said that his business is spiritual and not material, but as a ratepayer he has a right to give information to his Local Authority. He can also do much by advice and teaching to induce poor parishioners to attend to the sanitation of their dwellings. This Association could not do better work than circulate among the parish clergy leaflets giving hints upon sanitary subjects.

A LEASE of the premises having The Adelphi Theatre, been taken by a limited company, the theatre is now being remodelled and improved from the plans and designs of Messrs. Ernest Runtz & Co. For an extension of the façade, in accordance with the present design of the principal front, the site has been taken of the adjoining house on the west side, No. 412, Strand, and we understand that it is proposed to carry up the new portion by one story in the form of a tower above the existing elevation. The Adelphi Theatre has undergone various structural changes since the building of it was begun in 1802 for John Scott, who, with his daughter, opened it as the Sans Pareil on November 27, 1806. In 1821 Scott sold the theatre to Rodwell and Jones, who renamed it the Adelphi. Having been for some while under the management of Charles Mathews the elder and Yates, the house was modified internally, and a new

front, by Samuel Beazley, was erected in 1840. Then the house was rebuilt, in Benjamin Webster's time, after the design of Thomas Henry Wyatt—a view of the interior will be found in the *Builder* volume for 1858, p. 871—and reopened on December 27, 1858. The present front includes the Adelphi restaurant, which was built about fourteen years ago by the late Mr. Spence Chadwick; subsequent enlargements, and improvements of the theatre, have been made after Mr. W. Barnard Pinhey's plans and designs. A plan on p. 834 of our volume cited above shows the enlarged site and auditorium for Wyatt's building, with the extension that included nearly all the west side of Bull Inn-court. The old narrow front and entrance in the Strand remain until the restaurant was erected.

Some New
Decorative
Work.

LAST week we noticed the "1901 Book" of Messrs. Neatby, Evans, & Co., and have since then had an opportunity of seeing their exhibition of furniture and interior decoration. As we expected from the illustrations and general get-up of the catalogue, their work is of the ultra phase of the "Arts and Crafts" movement which is so popular with a certain section of the public. Mr. Neatby and Mr. Evans have both been trained in architects' offices, and we understand that they have been engaged in their present venture for less than a year. For so short a period the exhibition shows surprising versatility of subjects and materials handled—furniture, metal work, enamel, stained glass, embroidery, wall-papers, &c. Some of these are treated with originality and success, but as a whole the work strikes us as being of too popular a nature. Something more than novelty and precociousness is needed in furnishing a house. The one is obtrusive on entering a room for the first time, and the other soon comes wearisome. Occasionally we see modern furniture as good as that of the best periods of English furniture, and it is noticeably free from the self-consciousness that so permeates most modern designs. Much of the best furniture of Chippendale, Sheraton, and Hepplewhite is not beautiful, but it satisfies the mind that it is suitable construction and form for the purpose which it was intended. We believe, however, that Messrs. Neatby, Evans, & Co. will be successful in their venture; their training as architects is the best guarantee for their enterprise, more especially if some of the restrained design that is essential in architecture is carried into their new work.

The Goupil
Gallery.

THE Spring Exhibition at the Goupil Gallery contains a certain proportion of the kind of landscapes of which we are seldom wont to see examples there—landscapes such as Mr. Muhrman's "The Thames at Gunpowderbury," and M. Boudin's "Rue St. Roméouen," and others, which impress one as being painted in mud rather than in colour, but in spite of the rather dingy impression of the whole, there are some interesting works in the collection. Perhaps the most interesting is a small and very broadly handled forest landscape by Gainsborough (23), different from any other Gainsborough we have seen; a small landscape in grand style, and which has some quality almost reminding one of Diaz. There are two or three small works by Col-

of which "The Lake" (14), a composition and effect of which there are several repetitions among his works, may be said to be the only one which represents the real and typical Corot. A large work by Troyon, "A Normandy Fair" (45), represents a collection of peasants and cattle on bare plain with a tremendous rain-cloud over it; the figures and animals are treated with the painter's usual power, but it is a singularly unpicturesque and unattractive specimen of Troyon. Mr. Bertram Priestman's "Sunny Pastures" (3)—of very "sunny" is a good cattle picture with a quality of style about it. Among others of the more important works Mr. Weiss's "Midwinter" (57) is a fine though gloomy scene; Mr. Mouncey's "Kircudbright Lane" (62) is an example of very rough style of handling which nevertheless has a powerful effect when considered *en masse*; and Herr Steelink's "Flock on the Dunes" (65), a little picture which owes its inspiration to Mauve, has true artistic completeness.

The small room at 14, Brook-street, which is called by its owners the Dutch Gallery, occupied at present by a collection of figure studies in drawing, pastel, and photograph by Mr. C. H. Shannon. In general these works are not remarkable for beauty, but they show a variety of studies of the figure of considerable originality and power. The pretty features in the collection are the two sets of small circular wood-cuts of figure subjects treated in a decorative manner. They are stated to have been drawn, cut, and hand-printed by an artist, and appear to be printed in two parts; we do not quite understand the process, but the result is a novel and very pleasing effect.

THE ARCHITECTURAL ASSOCIATION DAY CLASSES.

A SPECIAL general meeting of the Architectural Association was held in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, on Friday evening last week, Mr. W. H. Rath-Smith, President, occupying the chair, when a scheme for the establishment of day courses of instruction was submitted for the consideration of members.

Early in the present session a strong Education Committee was appointed to consider and report upon the whole subject. This Committee consisted of Messrs. Cole A. Mans, F. T. Baggallay, R. S. Balfour, G. B. Arvill, Arthur Cates, B. F. Fletcher, H. L. Gorence, F. T. W. Goldsmith, H. T. Hare, G. F. Hooper, P. J. Marvin, E. W. Mountford, Beresford Pite, W. A. Pite, H. W. Pratt, H. Fellowes Prynn, E. Howley Sim, H. D. Charles-Wood, W. Howard Rath-Smith, John Water, Leonard Stokes, and Aston Webb, A.R.A. After six meetings, their Report was presented to the General Committee of the Association which had actually adopted the whole Report with few amendments. The proposals are as follows:—

1. That the studio be opened during the day, and that day classes be established forthwith. The work in these classes and in the studio to be of a preparatory and supplementary nature suitable for those who have entered or are about to enter architects' offices as pupils.
2. That this branch of the work of the Architectural Association be known as the day school, while the present classes be called the evening school.
3. That the first course of studies be arranged to cover one year, but students to be afforded the opportunity of taking a second year in the studio, when they might also attend some of the evening classes.
4. That each year be divided into three terms, namely, autumn, spring, and summer, consisting nearly as may be of thirteen weeks each.

5. That the work in the studio be supplemented by a certain number of lectures on history and construction, so that the students may better understand their work.

6. That a master of the studio be appointed at a salary to be fixed by the committee, who shall deliver lectures on the "History of Architecture and Elementary Building Construction." The master to nominate an assistant to help him in the studio, such assistant, if approved, to be remunerated as may be deemed expedient by the committee.

7. That the studio be open from 9.30 a.m. to 5 p.m. (1 p.m. on Saturdays), and that the assistant-master be in attendance during these hours. The master himself, however, would attend at stated times to instruct the students and deliver his lectures.

8. That the fee for the full course be 12 gs. per term or 35 gs. per annum, but students taking only the lectures to pay a fee of 2 gs. per term for each course, or 5 gs. per annum. Students wishing to join the day school must submit a letter of recommendation.

9. That after payment of the fees for the first year's course students shall be eligible for election as ordinary members of the Association without paying the usual entrance fee.

10. That students should be encouraged to cultivate a thorough knowledge of the French and German languages (if they have not already acquired same), as these languages are particularly useful for purposes of study and when travelling abroad.

11. That the studio library be augmented as may be found necessary, and be available at all times when the schools are open.

12. That the management of the school be under the direction of the Committee of the Architectural Association, assisted by an advisory board of eminent architects and other gentlemen.

13. That the following subjects be included in the curriculum:—

First Year's Course.

- (a) The use of instruments and scales.
- (b) Freehand drawing.
- (c) The five orders of classic architecture.
- (d) The elements of the various styles of architecture.
- (e) The principles of mechanics.
- (f) Elementary construction.
- (g) Sketching and measuring details and portions of existing buildings.
- (h) Thirty-six lectures on the history of architecture (illustrated by visits to buildings and museums).
- (i) Thirty-six lectures on elementary construction and materials (illustrated by visits to workshops and buildings in progress).

Each student will be expected to take up a course of reading under the direction of the studio master.

Second Year's Course.

- (a) Continuation when necessary of the subjects forming the first year's course.
- (b) Perspective and scenography.
- (c) Descriptive and applied geometry and graphic statics.
- (d) Principles of architectural design.

Each student will be expected to take up a course of reading under the direction of the studio master.

N.B.—Students taking a second year in the studio, should attend such lectures or classes, day or evening, as the master may advise.

The master of the studio will direct students as to their vacation studies.

The Chairman in opening the proceedings briefly explained the object of the meeting, and called on Mr. Aston Webb to put the scheme before them.

Mr. Aston Webb said that he looked at the matter from the general standpoint whether or not day schools should be started for the education of architects and the advancement of architecture. We were occasionally told that those buildings of old that we admire so much were erected without architects at all. That might be so, though he supposed if that were so they must, like Topsy, have "grown." Whether there were architects or not there must, at all events, have been some one to look after the buildings that were being erected, and judging from the lists of members of the Architectural Association and other architectural societies, there were likely to be architects for some time to come, and many of them. There were also many yet to join the ranks, and the question to be considered was whether, under the present system, or want of system, a young man entering the profession had sufficient opportunities for properly learning his calling. The two points that seemed naturally to arise were these: Were these day classes required, were they worth starting? If they were, was the Architectural Association the right body to start them? As to whether the classes were required, he would ask

what were the present opportunities a young man has in London of learning the profession of architecture. A young man could enter either as articled pupil to an architect, or as a paid assistant in an office where he might pick up what knowledge he could, gradually working himself into a position where he could obtain work for himself. Well, were architects content with that state of things? Was that sufficient? A pupil went into an office and was set to work drawing the Orders and learning the elementary problems of construction, mixing up those pursuits with a certain amount of office work, at first largely consisting of tracing. Now, the idea which occurred to the committee which had gone into this question of day classes, and certainly the idea which presented itself to his mind, was whether drawing of Orders and the acquiring of knowledge of elementary problems of construction—strains and stresses, the weights that various materials could carry, and such general elementary matters—could not be better taught elsewhere than in the office—at all events, for the first year or two of a young man's career. Judging from his own experience both as a pupil and as one who had had pupils, he was inclined to think that the acquisition of such elementary knowledge could best be started under the direction of an instructor in some such classes as those proposed, rather than in the more or less haphazard, fragmentary way in which it was now acquired. If pupils went through a year or two of such a course, they would enter an office better prepared to learn what they required to know than if they went into the office straight away. To be quite candid in the matter, he must confess that he had had no uncertainty in regard to these proposals. It occurred to him several times that a young man, in going through a course of one or two years in the Association classes (especially in the case of a two years' course) might by chance think that at the end of that course he was a perfectly fledged architect, or fit to go to some office as an assistant, or even start in practice himself. Young men were so sanguine and were so inclined to rush in where others were more careful, that he had thought that this might prove to be a danger; and, certainly, if anything of that kind occurred it would be a great misfortune. We knew that to a certain extent trades had given up their practice of apprenticeship, and all who were concerned with building knew how great the loss of that system had been, and then no technical institutes could take the place of the old system of apprenticeship to a trade or craft. In regard to this fear he wrote to Professor Simpson, who had been carrying on at Liverpool classes of this sort for some time, asking him for his experiences; and in the course of his reply Professor Simpson said that there was not the slightest danger of men, after a short course of systematic training, thinking they could dispense with practical experience in an office. "I hold," continued the Professor, "that the system I have started here is superior to the American or French system, because it does not carry this theoretical and liberal teaching beyond a certain point, and obliges the student to supplement it by a further term of years in an office." That seemed to him (the speaker) to dispose of his little difficulty. The Association's scheme seemed to afford an excellent opportunity to young men who desired it (and, of course, if they did not care for such an opportunity they could let it alone) of taking a course of a year or two of systematic training before entering an office. One part of the education of an architect which was extremely necessary was a knowledge of the history of architecture, and that could be better imparted by an instructor than by the busy architect during office hours. Of course, buildings were erected, and could very well be erected, by men who had no knowledge of what had been done in past ages, but for all that he did not think there would be any one who would suggest that it was not desirable for an architect to know the history of his art, or possess a knowledge of what had been done in past times. Professor Aitchison, he thought, used to tell a story of a Bishop of London who at a dinner once sat next to an architect, and who remarked subsequently to some friends: "It is most extraordinary, I have been sitting next to an architect, and have been speaking to him about the Temples of Prestum, and I found I knew more about

the temples than he did." We knew that a man might be a good architect and yet be ignorant about the Temples of Paestum; but surely, as a matter of education, architects ought to know more, or, at least, quite as much, about matters connected with their profession as an outsider knew. The Bishop, as a cultivated English gentleman, had a knowledge of matters other than those which immediately concerned him, and in the same way architects should have a knowledge of things which were not immediately connected with their practice as architects. It would be a very insignificant profession if it dealt merely with knowledge necessary to carry out their work.

It seemed to him that the committee had done wisely in deciding that it was necessary and desirable to start these day classes: what had been done in Liverpool with success could be done in London. Then the question arose, was the Association the right body to carry the work through? Those who thought the Association was the right body might ask: what other body is there? Well, of course, there were other bodies. The Government, had already, to some extent, provided the means for the establishment of art schools all over the country, starting at South Kensington; and in many, if not all of them, architecture was part of the curriculum for students; but he believed that most architects would prefer that architecture should be taught by or under the control of architects themselves, for architects in such matters would be more likely to know what the requirements of students were than instructors who were not necessarily architects at all. Then there were the County Councils to which people looked for most things nowadays. They did most things that were wanted of them, and no doubt they might start architectural schools. As a matter of fact, the London County Council had started an excellent technical school quite close by, where architecture was taught to some extent; but the same remark applied to them as to the Government schools. The Royal Academy had an excellent free architectural school, but it was very properly required in that school that before students could enter they must possess a certain knowledge of architecture, and must have proved to some extent their capacity. That requirement was insisted on in regard to all art students. The Academy did not undertake to find out whether a man was likely to be a painter or an architect, but if he showed certain knowledge and capacity the student was instructed for nothing, and so really the Academy school was the goal for a student after being through those classes. Then there was the Royal Institute of British Architects. Well, the Institute might possibly take up this work, but it had not done so, and therefore the opportunity appeared to have arisen for the Association to distinguish itself by at any rate making a start in this matter.

As to the risks which they ran, it might be asked whether a body of young men should run any risk, and was it a scheme that young men should attempt to carry through? He thought it was, because no one else was attempting exactly the same thing. Their President and the Committee saw that the Association had premises for which a heavy rent was paid, and which premises were at present only used in the evening, being vacant during the day. It was thought that the day classes might be started practically without paying rent, which was a good business proposal. The Committee had also had the foresight to realise that the members of the Association should be free from any financial risk in starting this scheme, and consequently it had been arranged that any possible losses which might arise in consequence of students not joining the classes should be covered by promises of help which would absolutely free the Association from any financial risk. It was really a case of "heads, you win; tails, you don't lose;" though there was really a very great chance that the classes would be successful, because they would meet a want. If that were so, the Association would have laid all their young professional brethren under considerable obligation in starting the classes. If the Association did not start these classes now, it was obvious that they would not be started for some time, and some other agencies for supplying the want might arise over which the Association would have no control. It was possible that in the future these classes might so

develop that other assistance might be required, but that necessity had not arisen yet. Therefore, as a member of the Association, he thought they should make the experiment in order to see whether the classes were wanted. The scheme which the Committee had drawn up might have to be altered or varied as occasion required; but it seemed to him, for a start, that it would answer very well, and if that meeting gave its general approval to the scheme, instructors would be obtained, the scheme would be advertised, classes would shortly start, and it would then be seen whether students would be willing to come forward. That would depend, he thought, to some extent on how far the senior members of the profession would assist in the matter, and that could not be known until the scheme was really started. When started, a practising architect, when a parent brought his boy to him for the purpose of articling him, might help the scheme by saying to the parent: "Let your son take a year's course at the Association schools, during which time it will be seen whether the boy is likely to take to the work, and if he does, at the end of that term I shall be pleased to take him into my office." If members of the profession would assist in that way, he felt sure the scheme would be a success. He intended to take that course, and he believed that other architects would do the same. It might be said that a young man could not afford to give a year of his time as proposed, and then go into an office; that, however, was not a real difficulty, because there were many men now who could and did spare the time to go to a University, and then enter an office to be articled. There were many men practising now who had done that to their great advantage, and their three years at the University had not been thrown away, for they had been enabled in that way to learn their art afterwards far more readily than they otherwise would have done. He had followed this course in regard to his own son, and he believed that the knowledge he thus acquired would enable him to make up for what might appear to be lost time. If the classes were financially successful, as he believed they would be, the Association would be able to expand its work considerably. Any one who knew the premises at Great Marlborough-street knew the need of more accommodation there, and it was probably known that with the present means at the disposal of the Association it was difficult to obtain the necessary extension. He had served for some time on a Committee for the acquisition of new premises. Several apparently promising schemes which they would have liked to carry through had been gone into, but when they came to the question of cost they had had to put aside those schemes as impossible. If, however, these classes succeeded, there would be no such word as "impossible" in connexion with any work the Association might undertake. He, therefore, proposed that the classes should be started, experimentally at first, and that they should undertake them on the lines indicated. He hoped that they would all do what they could in this very important departure in the work of the Association—a work which would be beneficial to all, and especially to their professional brethren coming after them.

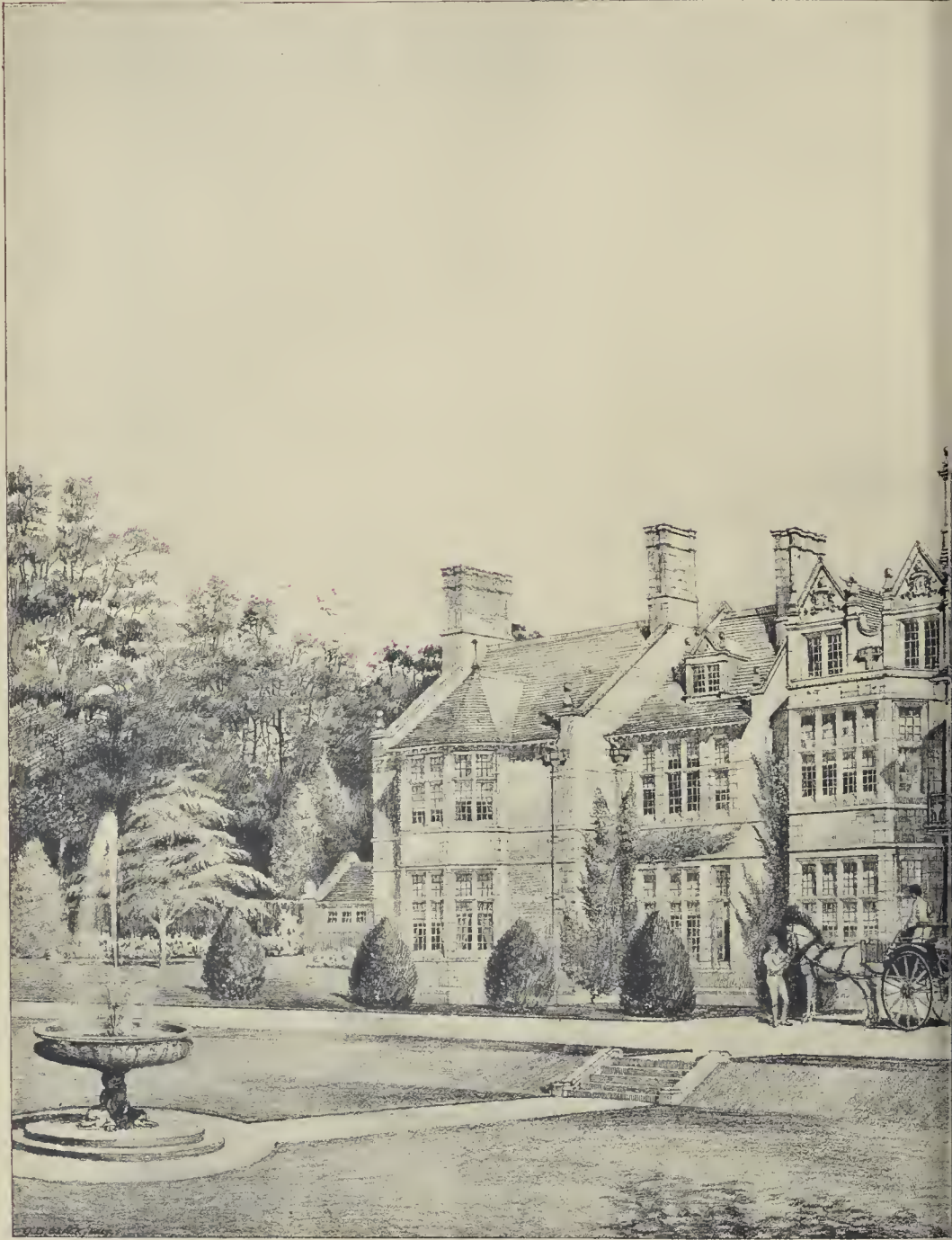
Mr. John Slater said that after the exhaustive way in which Mr. Webb had brought the matter before them there was very little for him to say in seconding the motion. The fact was that somebody—some institution—was bound to take up this question of the systematic education of young men who were going to be architects, and if the Association did not move in the matter now it might be too late usefully to do anything later on. There might be some feeling among members of the Association, especially among elder members, that the Association was going beyond its proper sphere in entering upon this scheme, but in his opinion it was too late in the day to give effect to such opinions should they be held. When the system of voluntary education, which was the *idée mère* of the Association came to an end, and when, after that very exhaustive inquiry into what was likely to be of benefit to the Association and students, Mr. Leonard Stokes carried his scheme of a regular system of education, the Association was bound to take up the system of day classes if the evening classes and the Studio work became, as they had become, a success. He did not know whether it was because of changes which had come over the method of living

during the last thirty years, but we now gave more time to recreation and to mate apart from our work than we used to, and he was afraid it was impossible to expect young men who were going in for a profession to give up evening after evening of the year round for study alone. Therefore I thought they must have some system of day classes. As Mr. Webb had said, a good deal of the success of the scheme would depend on the senior members of the profession, but though the success of such a scheme depended more upon putting the merits of it carefully before the parents and guardians of the rising generation. He quite agreed that a pupil would be of far more value to an architect, and would be able to learn his profession far more quickly if, instead of entering an office immediately after leaving school, he went for a year or two into classes such as those proposed; he would become a far better man all round. There might be a feeling that the institution of the classes would clash with others which were now running in the metropolis. As to that, he might say that the committee appointed to inquire into the whole subject carefully considered that point, and came to the conclusion that the style of class which would be recommended would not clash with anything being done in London at the present time. As to the advantage of a young man entering such classes on leaving school rather than immediately entering an office, he was quite sure that any one who knew the enormous advantage of a few years of study at a University would agree that students who made use of such classes would have a far better chance of better their education. Most of them knew what had been done in Liverpool and Manchester and elsewhere, and it was necessary that the same facility should exist in London. He hoped that the day classes which were proposed would be as great a success as the evening classes had been.

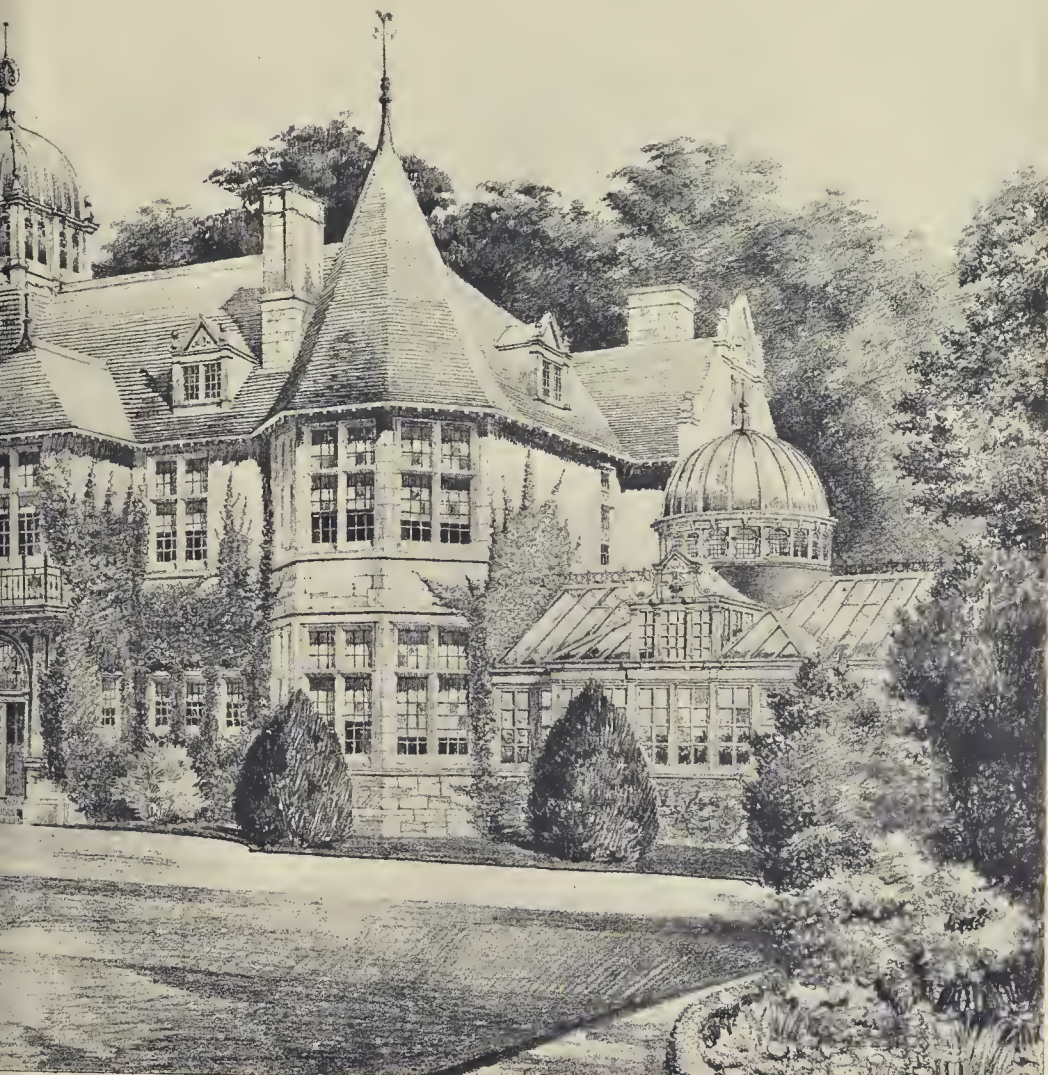
The Chairman said they would be glad to have some remarks from Mr. Stokes, the father of the present educational system of the Association.

Mr. Stokes said he could not claim to be the father of the system, although his name had been associated with it a good deal. It was true he did what he could, but he was greatly assisted by a very influential committee who did most of the work. He was very glad to think that the evening classes had proved a success, however, and he hoped that the Association would be encouraged to go on with the work they had begun, and on lines which in the days, when they first began to teach, were considered very radical and improper by some of their members. If the Association could work evening classes, he thought it ought to be able to work day classes, though, of course, there were great difficulties to face. One important difficulty was as to getting a thoroughly good staff, and a great deal would depend on the staff of professors, or whatever they called them. No doubt the committee would deal very carefully with that point, and would not clutch at the first men who came along. One great recommendation for day classes (he spoke from his own knowledge) was that as there were many parents who objected to their sons being out late at night, a scheme of day classes would be welcomed by them. He did not see why there should be any hesitation at all in regard to the committee proposals, for it could not fail to be a good thing for a young man to have some technical training before he went into an office. In an office it was very difficult for a green youth to pick up knowledge which would be of use to him, and it was months before he was fit to absorb the knowledge which was spread before him or hidden away behind him, unless he could discriminate he lost much time instead of acquiring knowledge which would be of use to him. The more pupils knew the more easily they learnt; and if they were grounded pretty thoroughly in some preparatory classes, and taught to know certain technical terms, and how to understand drawing, they were more ready to learn from their architect master all he had to teach. The students would learn in the school well all such things as principals, joists, mullions &c., meant, and that was the real reason why he was in favour of this proposal: it would not only prove a good thing for the pupil, but it would be good for the principal. It was an intolerable nuisance when one had some absorbing work on hand to have to instruct some raw youth in the



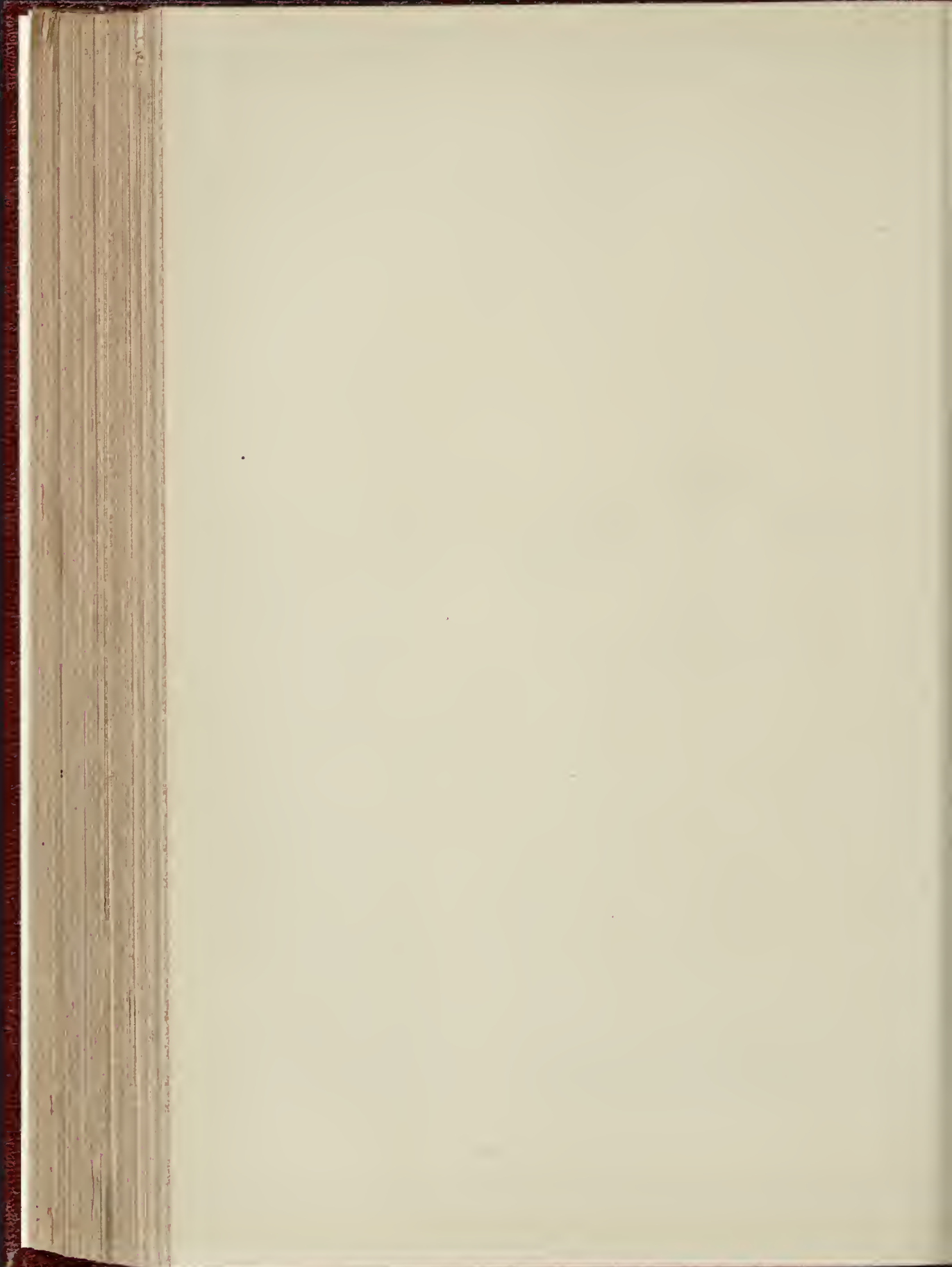


FRIMLEY HALL, SURREY.—M



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A. MATEAR, F.R.I.B.A., ARCHITECT.



ments of his profession, especially as that could be better taught by some one who had more patience. He thought the Academy School set them a very good example. The Academy School existed to teach architecture, not how to use a T-square—that must be learnt elsewhere. Why should not an architect insist on the same conditions? "I should like to teach you to be an architect, but you must learn first to use your T-square and instruments, and when you understand something about the profession I will touch you up a little." If architects were to say that he thought it would be to the benefit of all parties.

Mr. A. S. Tayler asked if the scheme had been prepared with the idea of being of advantage to those gentlemen who had already entered into a three years' pupillage. As to proposal No. 8, would it not be better to leave the terms to be settled by the committee rather than to pass a hard-and-fast resolution? There might be students who would like to attend the school one day or two days a week; apparently they would have to pay the full fee if recommendation No. 8 were left exactly as it stood.

The Chairman said that the day classes would be under the same regulations as those which governed the evening school, and under by-law 2, the arrangements for the payment of lecturers, instructors, and visitors, and the fees to be charged, were left to the committee. They would be perfectly free to vary the fees in certain cases and to take a smaller fee for a partial course. Professor Simpson had assured him that at Liverpool, in the earlier years of the school, there had been a good many casual students, who were no doubt articulated in offices and who wanted to take up special subjects in the Studio or classes. No doubt the Association would have students who would take up part of the course, and the fees would vary accordingly.

Mr. Arthur Stratton said he had had a little to do with the system of day training in the Liverpool school. From the time of the foundation of that school he had, until recently, been Demonstrator and Lecturer under Professor Simpson, and he had seen the working of the whole thing. It was rather begging the question nowadays to ask whether such education was needed. Perhaps, if there were no irritable or impatient masters like those referred to by Mr. Stokes, the old system of pupillage might continue to answer, for it had many fine points to recommend it; but the fact remained that, for some reason or other, it did not now answer, and there existed no systematic education for the architect. The Association had made a start with its evening classes, but they were not sufficient. A systematic course of education was certainly wanted, and among architects in Liverpool there was a sense of surprise that nothing had been done in London like that which was being carried out at Liverpool with success. It was actually a fact that young men wishing to become architects had gone from London and the South to join the Liverpool school, because there was nothing suitable in London. As to Mr. Aston Webb's fear that, after a two years' course, some young men might consider themselves equipped as architects, he could quite endorse what Professor Simpson had written on the subject. The success or otherwise of the classes would depend greatly on the teaching and the teachers. It was quite true that the Science and Art schools and Polytechnics did not teach architecture in the way the profession wanted it taught; it was done in a very amateurish way. The teaching, to be of value, should be done by practical architects and by men who had access to works in progress. One had only to take a student who had been through a two-year course to see how systematic was his knowledge as compared with that of the ordinary pupil. It was time gained, not lost, to a man who, because of his previous education in such classes, on entering an office as pupil or assistant, was of use from the commencement. It might be rather premature to discuss the curriculum, but there was one little point to which he would draw attention, and that was with regard to perspective being put in the second year. There was a three months' vacation, which he was afraid would always be a stumbling-block to the student, for imagine a young man in his first year being left to himself for three months! That difficulty did not occur in the case of an articulated pupil; unless a man were a University graduate, or had had already a good

training, he would probably waste those three months entirely. The first thing that a student should be induced to do was to go sketching during the summer vacation, but that he could not do without a knowledge of perspective, and therefore perspective should come in the first year. The Association was a vigorous body, and had done a great amount of good work in the past, and this movement could not be in better hands, and if the day classes were properly started and with enthusiasm, they would certainly be a thorough success.

Mr. Arnold Mitchell said that the question of the use the student would make of his time discussed by the Committee, and it had been suggested that the Instructor of the Studio would guide in some measure the studies which the student would pursue during the vacation. But he did not look at the matter quite from the point of view of the last speaker. The Cambridge vacations were long, and it might or might not be that the students in architectural study which existed for working up old work, for instance, there was reason to hope that the time of the Association student would be far more profitably employed during the vacation in any event than the time of the University student. On the general question there was one point to which he would like specially to refer, and that was as to the way in which education and facilities for it had grown to be a necessity of the day. We should be beaten in the race if we did not take every possible care in this matter of education. The whole tendency of the present day was to educate, educate, educate. In trade, England for a long time held commercial supremacy; that supremacy was being rapidly overtaken; foreign trade was increasing by leaps and bounds, and England was losing in a great degree the supremacy she formerly held. What applied to trade applied also to the profession of an architect. Other nations were educating, and though we hoped and believed that we were still ahead in the matter of architectural education and practice, there was not the smallest doubt that other nations were overtaking us. That very afternoon a young Norwegian architect who was seeking employment called on him with a roll of his drawings, which amazed him and others who saw them by their excellence. There were something like fifty drawings, and it was a great pleasure to look at them. He (the speaker) was astonished at the quality of the drawings, and still more amazed when he was told by the young Norwegian that some of the drawings, and these not the least good of those submitted had actually been done during school days before professional life commenced. We did not feel this competition in England yet, but we were bound to feel it in the near future. Let the Association provide facilities for young men gaining that knowledge and experience which would enable them to hold their own in the time of struggle which was undoubtedly coming. Who would not be in favour of doing all they could to help forward their profession by assisting the study and practice of their art, so that architects of the future might have every possible chance in the race of life? They must do all that they could, collectively and individually, to forward this good work in every possible way.

Mr. F. G. F. Hooper said the scheme had been very carefully thought out and studied. They all desired to help on the work of the Association, and the education of themselves and fellow-members. The difficulty of the long vacation had been anticipated by the Committee, and it had been thought that fellow-students in the Association day classes might be encouraged to spend their holidays together in that most enjoyable way by studying one or more buildings. As to perspective being placed in the first year, it was not likely that any student would attend their classes who had not already learnt the elements of sketching or drawing in perspective. He did not think the term "perspective" was intended to apply to sketching, but rather to the setting out of plans of work on paper in perspective. He most cordially welcomed the scheme and he wished it had been commenced long ago.

Mr. H. P. G. Maule said that if any one had come there that evening with doubts of the wisdom of the proposed scheme, those doubts would have been set at rest by the speeches they had heard. He had had considerable

doubt, for it seemed to him rather a large undertaking, which would retard the acquisition of new premises; but after what Mr. Webb had said new premises seemed to be more of an accomplished fact than before. New premises were essential to the well-being of the Association, for the present ones at Great Marlborough-street were not worthy of the Association, and a great effort should be made to get more adequate premises. He was now inclined to think that the proposed scheme of day classes might help them to get what they wanted. Looking at the names of those who had assisted in the preparation of the scheme just submitted to them, the ordinary rank and file of the Association must realise that an immense amount of trouble had been taken and everything done that could be done to ensure success. Every member of the Association, therefore, should help on the scheme in the best way he could.

The Chairman said he had received the following letter from Professor Beresford Pite, who was recently appointed Professor of Architecture in the Royal College of Fine Arts at South Kensington:—

"DEAR PRESIDENT,—I am sorry to see in the current number of A.A. Notes the circular announcing the conclusions of the Committee on the day classes, including my name as though agreeing with their recommendations. As you know that I am clearly of opinion that the proposal is unwise in the true interests of the A.A., I rely on your explanation to the meeting this evening that I entirely dissociate myself from the recommendations of the Committee to the general meeting. An important business engagement will prevent my attendance to-night.—Yours truly,

BERESFORD PITE."

The Chairman said he was sorry if there was any reason for Professor Pite's criticism on the way the circular had been sent out. He did not see that there could be, because Professor Pite's name was still on the Committee which drew up the new scheme of day classes. Professor Pite had never withdrawn his name from the Committee, and he was the only member who had withheld his support from the scheme. He was very glad to hear Mr. Mitchell's remarks, for the matter was an important one. The Committee was fully alive to what education meant, and they did not believe it consisted in cramming a lot of facts into the student, and in working out the scheme they would remember that education meant the opening of a man's mind in all directions and the guiding of students in their training and practice. They would try to make the system as flexible and comprehensive as possible, giving to the student's mind that information which was necessary to enable him to work out those problems he would be called upon to solve; and they would endeavour to make the student as susceptible as possible to every influence that would be of value to him as an architect. As to new premises, the matter had not been lost sight of, and when the day classes were properly started an opportunity would no doubt present itself for getting better premises. Even if within the next two or three years they did not get sufficient money to build new premises, there was no doubt that they would then be able to rent larger premises. The Committee had it in their minds to make an urgent appeal shortly in the matter. Already they could see their way to 1,500l.; three gentlemen had promised 250l. each. The whole thing looked very hopeful, but the difficulty was to get a site, and members of the Association might help forward the matter by making inquiries, wherever possible, for a suitable site near Oxford-circus in a street sufficiently dignified for the purpose. As to the day classes, they knew the Institute would help them by calling the attention of its members to the matter, and would ask the profession to afford every facility to pupils to attend the classes. As to the three months' vacation, if the students were worth anything they would make good use of their time and would be envied by the articulated pupil.

Mr. G. B. Carvill said that the hearty thanks of the Association were due to those gentlemen who evening after evening had given so ungrudgingly time and consideration to the scheme. The Association must be very grateful to them, and especially to Mr. Aston Webb for putting the matter before them as he had.

The Chairman said he must endorse the remarks made by Mr. Carvill, for the Association was greatly indebted to those gentlemen for their invaluable help. It only remained for him to put Mr. Webb's motion to the

meeting, viz., that the Association adopt the Committee's scheme for the establishment of day classes of instruction in architecture.

This having been agreed to unanimously, the following amendments and additions to the By-laws, consequent on the adoption of the Committee's scheme, were agreed to:—

Add to By-law No. 14, "Each student who has paid the fee for the first year's course of day classes shall be eligible for election as an ordinary member without payment of an entrance fee."

Add to By-law No. 15 after the words "Each ordinary member" (with the exception stated in By-law No. 14).

Add to By-law No. 27 at end, "or one of the Hon. Secretaries."

Add to By-law No. 30 before the word "Auditors" "Honorary."

Add to By-law No. 36 the word "Honorary" before "Auditors" in every case.

By-law No. 43 to read as follows:—

"A special general meeting shall be called when required by the Committee, or at any time, not less than two weeks nor more than eight weeks, after the receipt of a requisition stating the purpose for which the meeting is required, and signed by at least twelve ordinary members. The presence of twenty-five ordinary members shall be necessary to constitute a quorum at any meeting called under this by-law, and in each case the agenda of business to be considered, specifying the place, day, and hour of meeting shall be duly posted up in the premises of the Association, advertised, sent by post or otherwise, as may be determined by the Committee, at least one clear week prior to the meeting, and no other business shall be taken at such meeting."

Omit By-law No. 44.

Add the following new By-law:—

"No member of the Committee shall be appointed to a paid office or Lectureship in connexion with the Association."

The meeting then terminated.

MAGAZINES AND REVIEWS.

THE *Architectural Review* (Boston), vol. vi, No. 7, contains an article on and illustrations of the work of Mr. F. Lloyd Wright, an architect who seems to have made a good many original experiments in house-planning and the exterior treatment of houses. The whole of the plates are occupied also with illustrations of his work, in a style of quasi-ornamental drawing which is rather pretentious and not very attractive. There is certainly cleverness in Mr. Wright's work, but not the feeling for architectural treatment; the illustration given of a high building (no title) looks quite absurdly like a Broddingnagian bookcase or cabinet; there is no sense of scale about it. No. 1 of Vol. III. contains an article on the formal garden of Longleat, and a more important one by Mr. Robert Brown, on "English Half-Timber Architecture," which, however, the writer says distinctly he does not advocate the revival of; he is only considering it as a beautiful chapter in old English architecture. In regard to the overhanging of the upper stories, he suggests that this was really to preserve the lower part of the walls from weather, and not for want of space, as this overhanging is found in country houses in isolated situations as well as in towns. But it is perfectly possible that its use in country houses is only an imitation of a practice first used for economy of space in cities. It must be remembered also that in any case it means economy of foundation walls. The illustrations include a bird's-eye view of the proposed buildings for Washington University, St. Louis; an immense scheme, in which, so far as we can judge from the small views of the buildings in the drawing, English Elizabethan types of University buildings seem to have been taken as a model. We do not think that there could be a better model, and perhaps there is an æsthetic consistency in repeating in the New World the architectural type of the universities of the Old World, which have formed to some extent their educational type also. A number of detail sections of various portions of the proposed buildings are given.

The *Berliner Architektur-Welt* contains a number of illustrations of recent Berlin house architecture, half-timbered villas for which we have little admiration, and a more dignified and solid stone structure, the villa Ernst Hester, in classic style and very effectively decorated with sculpture, which is an exceedingly good example of the superior class of domestic architecture. Herr Ravoth, of Berlin, is the architect. The German architects are nearly always good in this kind of Classic and sculptured house; it is in the "picturesque" villa

style that they fail. There are a good many examples of modern decorative work, among which some open-work metal screens for heating apparatus (*Heizkörper-per-Kleidung*) are worth notice as being in artistic treatment quite beyond the usual style of work for this purpose.

The most interesting article in the *Art Journal* is that by Mr. Solen, entitled "Pâte-sur-Pâte," and which is an illustrated description of the design and methods of the Sèvres manufactory. The illustrations are very beautiful both in themselves and in execution. The writer shows how artfully some of the materials used in Sèvres ware are fashioned to produce changing effects of light and colour to add to the charm of the work.

"A compound of bichromate of potash and alumina, fritted together," is used to produce the changing effects of the "Pâtes changeantes" of the Sèvres manufactory. Its delicate shade of pink possesses the peculiarity of being highly intensified by artificial light. It lends itself to the following artifice:—A small quantity of the compound may be introduced (without producing any apparent alteration by daylight) into a blue or green paste; but when the mixture is exposed in a room illuminated by gas, blue and green are so completely altered as to become, respectively, bright lilac and warm red.

A Hungarian appreciation of Mr. Walter Crane is the subject of another short article, in which Mr. Lewis F. Day sums up some of the expressions in regard to the English artist's work which were made in the Budapest Press at the time of the exhibition of his works there.

The *Magazine of Art* contains an illustrated article on the "Decoration of the Grand Piano," by Mr. Aymer Vallance. In the course of it he suggests that the treatment of the modern heavy grand piano with sturdy legs at the angles but no central support is defective; but this is in accordance with the make of the instrument, the strong frame of which is necessarily entirely self-supporting; and the intrusion of central brackets or supports is therefore not only constructively unnecessary, but has the appearance and would probably have the effect of checking sonority; and in all piano decoration it must be remembered that the musical efficiency of the instrument is the first point, the decoration only the second. In our opinion some of the more elaborate piano decorations of recent days have had the effect of obscuring and making secondary the real object of the instrument—so much so that we are under the impression that these highly-decorated pianos are seldom or never found in really "musical" houses. What is wanted for the grand piano is not so much elaborate decoration as a well-considered shaping of the parts in accordance with the structure and function of the instrument. Mr. Vallance indeed points out, and quite rightly, that the design made by Burne-Jones, which is among the number illustrated, and which is a fine one in itself, is carried out entirely irrespective of the hinge in the front part of the lid, and that the exterior design is so placed as to stand on its head when the top of the piano is propped open. This is not decorating a piano; it is merely making it a surface for painting a picture on.

The *Artist* devotes an article to the work of the clever and original artist Mucha, a Parisian in work and domicile though not in name, with a number of his figure sketches. "A Summer Cottage" designed by Mr. Quennell is the subject of another article. The plan, we observe, is given without a compass, though this is surely a very important point in a "summer cottage."

Among the contents of the *Studio* (February 15) is an illustrated article on Mr. Frampton's sculpture decoration for the Glasgow Exhibition building; one on Maori houses, with the quaint wood carving, and some illustrations of the interiors of a new house, "Glen Park," near York, of which Messrs. Penley are the architects, and in which there seems to be a good deal of originality of decorative treatment.

To *Fellden's Magazine* Mr. William Brew contributes the first half of a valuable article on "Electrical Fires." Interesting photographs are given of tin, copper, and platinum fuses at the moment of "blowing," and the different way in which the arc acts in these various cases is pointed out. When a tin fuse "blows" the arc is very much displaced, and may strike any live metal in its neighbourhood. This is a strong argument against employing double pole fuses under the same cover, as a disastrous

arc may start between the positive and negative terminals. Mr. Brew is strongly of opinion that with the high voltages now in use a more suitable material for fuses than tin might be employed with advantage to the porcelain bases. He agrees with us in thinking that the insulation resistance between the mains ought always to be determined. He points out that when the voltage is raised from 100 to 250 the insulation resistance ought to be 6.25 times greater. He has come across cases where the section of the positive wire has been so reduced by electrolysis due to leakage currents, that became red-hot when the normal current was flowing. This shows the necessity of a high standard of insulation resistance. We do not agree with Mr. Brew that a concentric system with the outer earthed is the system of the future. From the central station point of view there are many drawbacks to this system apart altogether from the electrolytic damage it would do to gas and water pipes. An article by Mr. Kilburn Scott on "Electric Driving of Textile Factories" is a timely one. It is extraordinary that while a Bradford firm supplies thousands of looms fitted for electric driving to the Continent, yet it sells none in this country. Mr. Scott mentions that the ribbon industry in the score or so of towns and villages about St. Etienne, in France, has revived owing to the establishment of a large public electric power supply company in the neighbourhood. This company supplies power to 2,500 ribbon looms, each having its own little 1 h.p. motor. The charge for power is ten francs per motor per month. We recommend any one who is sceptical about the suitability of electric motors for machine-driving to read Mr. Scott's article.

The *Engineering Magazine* has an article on "Engineering Opportunities in Asia," which gives some interesting information in regard to the manner in which modern machinery and methods are slowly penetrating into the Far East. There is another article on "American Locomotives on British Railways," the title of which is misleading; it should be "on British Colonial railways," for that is the real point; the engines referred to are all in use on New Zealand, Australian, and South African railways. The truth seems to be that since these Colonial railways are for the present but roughly constructed, the roughly finished American locomotive suits their work, and is more economical than the highly finished and conscientiously built English machine. That is not, it is true, what the writer of the article wishes us to conclude, but that is the conclusion we draw from it. The same number contains an article on "Electric Power Machinery in Iron and Steel Works," by Mr. S. F. Walker, which deserves study by all interested in the important industry of iron and steel making. Illustrated descriptions are given of various kinds of electric cranes which lift iron pigs, rails, and plates simply by the attraction of powerful electro-magnets. Magnetic separator are also shown which recover the iron from the waste slag left in the converter. The slag is first ground up into a powder in a mortar mill. It is then poured into the magnetic separator, round the drum of which are placed magnetic poles which magnetise the particles, first in one direction and then in the other, so that the non-magnetic material clinging to them is thrown off by their continual rotations and so the cleaning is done very efficiently. Mr. Walker rightly points out that motors are often designed on too small a scale, leaving a very small margin for emergencies, and the consequent frequent "blowing" of the fuses has unjustly discredited electric driving. Unlike steam-engines, the efficiency of motors is often greatest at a light load, and hence it is more economical to have the motor too large than to have it too small. It is stated that enclosed arc lamps have now displaced the large glow lamps which were formerly used for lighting the rail mills. In conclusion, Mr. Walker discusses the relative advantages of polyphase and direct-current systems, and sums up in favour of the former. In an editorial Mr. Whitehouse's theory that the internal heat of the earth may be generated electrically by eddy currents in the earth's substance produced by magnetic lines of force between the earth and the sun, is commented on favourably. In our opinion, however, seeing that all the direct experimental evidence of magnetic observations negatives the supposition of lines of force fixed in space, this theory is quite untenable—the theory of thermo-electric currents enunciated by Lyell fifty years ago.

The *Nineteenth Century* contains an article by Signor Boni on "Strata in the Roman Forum." This describes the method of investigation he has been pursuing by sinking shafts through the various archaeological strata, as he calls them, of the Forum, and the discoveries which have been made in this manner, and also in the existing shafts in the shape of ancient wells. More than thirty wells have been found in the Forum area, either of the Republican period, and sunk previous to the building of the aqueducts, or of the mediæval period, and sunk after their destruction. No well has been found which appears to belong to Imperial times, the aqueducts having then sufficed for the supply of water. Signor Boni says—

"The interest of these wells is as storehouses, for they have preserved to us, among the earth and mud of which they are full, the innumerable miscellaneous articles which found their way into them. A rope wore out, or a pail broke; a passer-by, lazy or mischievous, threw down something to the depth or to hear the water splash; things were thrown in to be rid of them, or accidentally pushed over the edge. The accumulations of a well may represent few or many years, according as it was frequently cleaned out, or was abandoned long before filling it up. Each is like a sealed packet 1000 years old, with a value dependent on our power of appreciating it."

The same number also contains an article by Mr. R. C. Witt on the Romney portraits at the Grafton Gallery, which, however, as our readers would have already gathered, we do not think are of sufficient importance as to demand a special article. Romney at his best was a very fine painter, but his second-best works were hardly worth discussing in so serious a strain.

The *Monthly Review* contains an important illustrated article by Mr. Arthur Evans on his recent discoveries in Crete; and an article by Captain Hart-Davis on "London—a Seaport," of the course of which it is suggested that a canal of forty millions should be raised on the security of the existing property in docks and wharves, and placed in the hands of a Trust to be used in improving the river and forming better key and dock accommodation. There is no doubt that the improvement of London as a port is a matter of the greatest moment, and the suggestions in the article should at all events receive consideration.

In the *Century* Mr. Birrell continues his articles on "Down the Rhine," with the illustrations by Mr. Castaigne; they are interesting considerations of a well-worn topic in a new light. Some "Personal Recollections of Rahms" by Herr Henschel will interest our usual readers.

In *Scribner*, under "The Field of Art," the subject of "French Architectural Decoration" is considered by M. Alexandre Sandier (we presume it is a French article translated), with special reference to the Sévres manufactory exhibit at the Paris Exhibition. The article is, however, merely historical and descriptive, so far as it is carried in the present number; it appears to be intended to continue the subject.

The *Fortnightly Review* contains an article by Mr. H. Heathcote Statham on the Loan Exhibition of Pictures at Burlington House, mainly occupied with the consideration as to which of the artists deceased within the last fifty years best stand the test of the revival of their works. The absence of any representation of either Macise or Creswick in the exhibition is noted.

The *Pall Mall Magazine* has an article on the style Howard and its contents, by Lord Ronald Gower, who, however, has little to say of Vanbrugh's architecture, except that the general effect of the building is "sublime" and "the family is mostly occupied with the history of the works of art contained in it. The numerous illustrations add, of course, much to the interest of the article. The same number contains also a short article by Sir Robert Ball "Signalling to Mars," not, as may be supposed, a code of directions for the purpose, but a common-sense demonstration of a practical clear-headed man of science as to the utter possibility of signalling to Mars by any means within present human knowledge. It is an article, in short, calculated to put an end to a good deal of nonsense which has been written on the subject.

The *Revue Générale* has an article by M. Eugène Gilbert under the title "Impressionistes Critiques," which is really a criticism of various art criticisms, and serves to give a kind

of summary of some contemporary French opinions on matters artistic. It appears that there are some critics of the day who are very bitter against the Paris Exhibition. A M. André Hadlays is particularly sarcastic about the Exhibition architecture, in which we certainly do not agree with him; and about the expenditure of so much money and labour on a temporary spectacle. On that head there is certainly something to be said.

The *Essex Review* (quarterly) contains an article on the subject of "The London Littoral," the scenery and small towns on the Thames banks below London, particularly written to urge that some of them at least should be left as they are. That, however, is not in the power of any law or any argument, we fear, to accomplish. A historical and biographical article on "The Dunthornes of Colchester,"—two artists, father and son, who lived there in the eighteenth century, is interesting, and is illustrated by reproductions of some curious old prints.

The *Quarry* contains a long and important article on "The Building Stones of London," with some photographs from portions of old buildings to show the wear of the stone, and an alphabetical list of buildings and stones referred to in the article.

Among the contents of *Knowledge* is a summary by Mr. Crommelin of the total solar eclipses of the twentieth century, with a chart showing the track of totality for each one. The series of articles on the size of ocean waves is continued.

We have received also *Harper* and the *Gentleman's Magazine*, neither of which contains anything which it comes within our scope to comment on.

THE SURVEYORS' INSTITUTION:

THE PRESENT CONDITION OF THE BUILDING INDUSTRY.

AN ordinary fortnightly meeting of the Surveyors' Institution was held at Great George-street on Monday evening last, Mr. John Shaw, President, in the chair.

Some donations to the library and library fund having been announced, and a vote of thanks passed to the donors, the Chairman called on Mr. H. Chaffield Clarke to resume the discussion on the paper by Mr. Thomas Blashill, read at a previous meeting, on the "Present Condition of the Building Industry."

Mr. H. Chaffield Clarke said that Mr. Blashill had referred to the employer and to the necessity of showing him more consideration. That was no doubt true, but one thing to be insisted upon was that the employer should tell his architect everything, keeping nothing back, and should treat him as he would his solicitor. Often the client only told half the facts, and that was not quite fair to the architect or surveyor, who would respect confidence as much as the solicitor. Once the drawings and specification were completed, and the contract signed, he had been taught never to depart from it, except for very good reasons, and not alter a specification without very careful consideration; rather complete the building and then alter, than alter when in progress. Slight variations led to all sorts of trouble. Mr. Blashill had written some very wise words regarding the employer who took every advantage of a contractor. Many employers seemed to think they could bind down the builder and do any shabby thing, such as they would not think of doing to any other tradesman. The architect should hold the balance fairly between the parties. As to the selection of the builder, the whole success of the building depended largely on that. The architect must be responsible for the builder selected, and should the client do the selection, it was always well to warn him, unless one knew the builder, that he must take the risk of the selection; for it was perfectly impossible for an architect to teach a builder (although a builder would not allow that he wanted teaching), nor were they paid 5 per cent. to play the detective. Mr. Blashill suggested that they should prepare full-sized details before the tenders were obtained. That was a most Utopian idea, and he thought that if an architect supplied 1/4th scale drawings with 1/2-in. details, the quantity surveyor could take off from them. Surely that was sufficient for the quantity surveyor; besides, one must have some power of varying details

as the work proceeded. Of course, it was important not to hinder the builder in any way, but it did not seem practical to give him full-sized details before the job had started. The difficulty of speed was largely controlled by materials, and one of the materials to avoid if there were to be no risks of delay was terra-cotta. As to quantities, the employer's architect very often recommended a quantity surveyor and selected one, but it was a very usual course in any large job for the builders to select a quantity surveyor and the two surveyors to take off the quantities between them. That seemed to be a very fair and proper system, and one to be encouraged. He saw no necessity for making the quantities part of the contract. The quantities were only a means of obtaining tenders and prices; they were not part and parcel of the specification from which the job should be carried out. But it was wise to price them out and deposit them to measure variations upon. As to subletting, that was a very important question, and there again the architect must retain the power of selecting certain materials as well as the firms who tender, and put the amount of the lowest tender into the builder's contract. The builder should bind down the sub-contractor to time as he himself was bound down. He agreed with the author that most of the trouble in building work was avoided by clear drawings and specifications before the works were commenced, and nearly all disputed accounts which had come before him had arisen from want of proper drawings and specifications, and the interference, perhaps, of the lady client. It was a most important point to be remembered by young men in the profession that drawings and specifications should be perfectly clear; while it was especially unfair to builders and contractors when they were not. He did not agree with Mr. Blashill that the quantity surveyor should write the specification, for he thought it was the architect's business to do that, but the quantity surveyor could correct it from the quantities. As to Mr. Blashill's remarks about American buildings and the promptitude with which they were erected, he would like to know what the width of the streets in the States was where these monstrosities were put up. A building of from eighteen to twenty-six stories would have a height of from 180 to 200 ft., and was it wise in any city to have such buildings unless the streets were of abnormal width? Healthiest streets were light and air and sunlight. The healthiest streets in London were the East End streets—Whitechapel-road, Mile End-road, and Commercial-road—beautifully wide streets with low buildings on either side. The most dismal and draughty and unpleasant street was surely Northumberland-avenue, where very little sun got, besides being draughty, cold, and dull. The great height entailed much greater risks from loss of life by fire. Rather than build such high buildings he would prefer to take people a little further out, into the suburbs, where they would get more light and air. Mr. Blashill touched very lightly on a delicate subject, viz., the question of an architect's office in a builder's firm. Although Osborne and houses in Park-lane had been built by builders with an architect's office, although they might be good architecturally, and although there might be many competent architects in builders' firms, if that system were pursued the desirable check of the architect on prices and materials, and on the non-waste of materials, was done away with, and he thought the practice ought to be discouraged in every way. As Mr. Blashill said, the most satisfactory way to build was to build on a schedule of prices, and all in that room would wish to carry out their work in that way; but few young architects had, as a rule, enough weight to have their work so executed; but still it was the fairest way, and gave the best results for money. As to speculative builders, there existed also a class who might be better described as financial architects, who were very much in evidence in London just now, and did great harm to architects by taking sites at ruinous ground-rents, out of which no man could live, and on which they put up buildings. This had a serious effect on legitimate building, for it stopped genuine speculation. They were really not ground-rents at all, but half ground-rents. The practice was very much to be deprecated. In regard to the labour question, they should all approach it away from politics. It was much too important a question, for it was associated with the success of the country, and must be approached from

* See our issues for March 2 and 9.

the point of view of the good of the community. He had always felt that the question was approached from two different sides, and for the good of the few and not for the many. Since 1870 there had been such an education as had never been dreamt of before, and a serious question was whether it had been the stepping-stone for their improvement and the improvement of the country. And had it helped the people to look the future fairly in the face? There was also the much bigger question of technical education, against which he had not a word to say, especially as he knew what good work was being done by the City Companies, such as the Carpenters, Plumbers, Drapers, and Fishmongers. But what had the technical schools done towards fitting the artisan towards getting a living, for that was the practical point? Did they help a man to do his work when he left them? Hundreds of men attended these classes; what proportion turned out good craftsmen? Some time ago he went to a large manufacturer to inspect some models, and he asked the head man what number of men coming from technical schools were good craftsmen, and the answer was that the number was very limited—practically none. That was a sad observation to make, seeing what was spent every year in this work. Any one who had had anything to do with colour—even the simple painting of a door of a house in two colours, in contrast—would realise how difficult it was to get a workman to do this satisfactorily. It was all very well while one stood over the man, but if they left him to do it, the chances were that the work would have to be done again, and one would have to mix the colours oneself, for the workman seemed neither to care nor to take the trouble to appreciate the elements of colour. He believed there was in London at the present time a great opening for a colourist, or a combination of them, who could colour simply and well, and not at an extravagant rate. If, therefore, technical education, although useful, failed to produce men who could put their learning into practice, what was the remedy? In his opinion it was to go back to the old system of apprenticeship. A lad should be put with a good craftsman and be bound to learn his trade, and not dragged up to his trade and polished off by some technical class. He could not understand why workmen should object to the system, for if the number of workmen was limited, so the scope and amount of trade was limited. That was a political economy question, but that seemed to him to be the result; and he would ask the workmen and the unions to consider the question seriously, and in this light. Until the system was encouraged again and masters took a pride in their apprentices, so long should we suffer from incompetent workmen, and men with no love for their trade, and who merely looked upon it as a means of livelihood. Nobody doubted the legality and usefulness of trades-unions to their members, and they had doubtless been a necessity to prevent sweating; but were the unions looking well to the future, and considering all the problems of the questions of supply and demand, capital and labour? Were they not looking too much to the present and the "flesh pots of Egypt"? Had not the limitation of hours and the amount of work which by unwritten laws they enforced a tendency to drive capitalists to seek labour elsewhere? and was that not a serious question for them all? He recently had an illustration of this, when a London architect, who was building a house for himself, told him he was using Swedish doors and sashes because they were good and cheaper than English work. That architect had no desire to buy foreign goods, neither had he (the speaker), but the result of those unwritten laws he had referred to was to drive employers to seek labour elsewhere. During the carpenters strike seven or eight years ago, a leading London firm of builders was seriously considering the question whether to set up works in Belgium where labour could be got without trouble and undue expense. What he feared was that the unions were making work so expensive that they were crippling trade, and was not a steady and increasing trade a necessity for the country? In the current issue of the *Nineteenth Century and After* was an article by Mr. W. Woodward on the question, in which the writer gave the Board of Trade returns showing the enormous rise in wages of 115,000*l.* per week in 1899 compared with 1898, and in eight months in 1900 a net

increase of 150,000*l.* per week, by far the greatest rise recorded in any similar period. Were mechanics really better off for that? They certainly ought to be; and were they putting money by for the future? The mechanic was better paid than clerks, and if he worked had he not as much or more chance of success as the clerk? There were such positions as foremen, overseers, &c., open to the mechanic, and altogether his life was not without interest and not without hope for the future if he worked industriously. But did the men with this increased pay really work better in the limited hours or not? He was afraid there would be but one answer by any one who had been on works and seen how the men worked. He had no hesitation in saying from an experience of twenty years that they did not. The men seemed to think that restrictions on output were good for them and made work for men on the streets; but, of course, that was a fallacious argument. They were trying to step in between supply and demand and create an artificial state of things which could not last long. He thought it was most important that the trades-unions of the country, powerful as they were, instead of fighting the employers, should, as much as possible, pull together with them and strengthen their trade. There was no better way to do that than to have a proper system of apprenticeship through all the trades, and so teaching men their trade thoroughly.

Mr. H. Lovegrove said that Mr. Blashill was certainly right in insisting that good pay should be given to clerks of works, so as to ensure good trained men, and not men who were only good foremen. It was very desirable to get good clerks of works, and he thought that good ones could generally be got from the Clerks of Works' Association. Many architects had to make a stand for fair treatment of the builder at the hands of a grasping client or committee. Some people seemed to regard a contract as a sort of lottery, and their idea seemed to be to get the main contract settled and then grind as much as they could out of the builder. As to sub-contractors, it seemed to him that the contractor should appoint the sub-contractor under the very same conditions as he had been bound under. Delay was frequent under the present conditions, and sub-contractors for terra-cotta and ironwork were frequently at fault. As to commissions to architects on introducing business, that was an utterly wrong principle, and nearly all architects, certainly all good architects, would have nothing to do with firms which made such offers. Unfortunately, some people seemed to think that the practice was a common one, and it was even said that the builder gave the architect a commission. As to builders not being practical craftsmen, he thought that provincial contractors, as a rule, were more practical than London men, the London men having much to do with financial matters, and some of them were not "builders" at all. The country builders were brought up to the business by their fathers. The larger class of speculative builders was doubtless very injurious to the profession of architects, for they built in a wholesale way, though not always with the best materials. As to apprenticeship, much had been lost by giving up the system. In the old days men learnt their trade thoroughly, and never thought of attending evening classes; still, the artisan ought to attend evening classes now, so as to get theoretical as well as practical instruction. The building trade was looked after very closely by trades-unions and the authorities, but other trades and callings were left alone. No one seemed to think of the big carriers and the hours of their men, but the workmen in the building trade were protected in many ways. The paper had dealt with another important matter, which was intimately connected with the difficulty under the present conditions of dear land, high rate of wages, and cost of materials of providing houses for the very poor.

Mr. J. Randall said that Mr. Blashill was quite right in saying that before a building was started the drawings, specifications and details should be placed in the hands of the quantity surveyor. It was quite impossible for the quantity surveyor to take out quantities from the crude and incorrect drawings sometimes sent out from architects' offices, and it was unfair to client and builder, for it was simply impossible to make an estimate on improperly prepared drawings. A great deal of trouble arose from defective drawings and specifications, and if large bodies like the

Office of Works and other Government Departments could give proper drawings surely architects concerned in buildings costing large sums of money could get out proper drawings and specifications. He was carrying out work for the Government now which was costing three-quarters of a million, and he had no trouble such as he sometimes had with architects, who gave a little bit of the ironwork masonry, or woodwork at intervals. As to Mr. Blashill's remarks about steelwork being prepared by some builders, his firm turned upwards of 2,000 tons a year. It was no more trouble for them to buy steel than the expert and his firm prepared nearly all their steelwork, and that was largely the practice in America. That lesson might be learnt by everyone, and there would be no need to call the expert, who had to get his price. It was too often the fact that this expert got most of the profit, and it was impossible to get him down or claim for delay, for he would ignore the builder, except for payment, saying he was employed by the architect. He was decidedly against provisional amounts going into estimates, and he might say that if Government did not allow it. As to technical education, we get a lot of it now, but that did not seem to produce better workmen. Of course much work was now done by machinery, and the workmen did not, for instance, cut out the wood and do the labour himself as used to be the case. The result was that there were apprentices, and as long as a man belonged to a trades-union he could consider himself a mechanic. The old mechanics were dying out fast, and he was quite sure that if the country was to hold its own they would have to go back to the old apprenticeship system. Another point he might mention was that it was almost impossible to get merchants to agree to time bargains, for they had a club to protect themselves in the case of a strike. For that and other reasons, a large quantity of materials came into this country from abroad. Probably nine-tenths of the glass used in the country came from abroad; there were really now only about two glass firms in this country. It was the same with the cement and steel. He gave an order about twelve months ago to an English firm for steel, and had not yet got the whole delivery. He gave an order to a foreign firm in November last for a similar amount, and he had got the whole of the goods. He would give another illustration of what the trades-unions were doing for the country. The other day his foreman said they wanted a new machine for moulding sashes. They sent to two or three English firms, and those firms could not do the work in less than from three to six weeks. A German firm supplied the machine in seven days.

Mr. C. John Mann said, as to Mr. Blashill's remark that the employer was entitled to make consideration, the employer generally knew about what amount of money he wished to expend, but that amount was very often exceeded by the estimates, to the annoyance of the employer. That annoyance could be prevented to a large extent if an approximate estimate were made by the surveyor and submitted in writing to the employer or architect. If that were done, a great deal of trouble would be saved to all concerned. Another point, which quantity surveyors were very sensitive as to mistakes in quantities, though, thought, mistakes were not often made, and quantities should not be made a part of the contract on this account. Mr. Blashill might have been a little clearer as to what he meant by "reasonably priced quantities" forming the basis of the contract. Was that to be ascertained by the quantities being opened? or was that to be done before the contract was entered into? How was it to be ascertained that they were "reasonably priced" and a proper basis for a settlement of a contract? He did not think it was always a good thing for quantities to be made the basis of a contract. He differed from Mr. Blashill where he said that a fair settlement was impossible with extensive changes in a contract. It was quite possible to obtain a fair settlement and with carefully taken out bills of quantities he saw no difficulty in arriving at a perfect fair settlement of any amount of variation and it would be a great mistake to restrict the employer in making alterations in his building if those alterations would make it more satisfactory to him. He hoped they would not see in this country any of those lofty buildings to which reference had been made, whatever the

width of the street might be. He believed it would be a great gain to the country if the apprenticeship system could be reintroduced in the building trade.

Mr. H. H. Bartlett (Perry & Co.) said as to sub-contractors, that was a sore point with builders. Where there were sub-contractors (and they had in some cases become rather numerous) the chief contractor had little control over them, for the sub-contractor was appointed practically by the architect. The builder was very strictly tied down, both as to time and the manner of carrying out the work, but he had little or no control over the sub-contractor. That was a difficulty which it was quite within the power of architects to remedy; and if architects could do so, and there was more confidence in the chief contractor, then buildings would be erected in a far more satisfactory manner. As to technical education, the results so far were very poor. In his opinion the British workman was not in the slightest degree more intelligent than he was thirty years ago, and though there had been time for great improvements, the result of the expenditure of mind, time, and money on education was not what might have been expected. The introduction of foreign manufactures would very probably increase, though trades-unions were not entirely responsible for that. One of those was that rents, taxes, and outgoings were less in those countries where iron, for instance, was produced, and steel and iron manufactures put together, than they were here. That meant a great deal in the course of a year. In this country the manufacturer was taxed with very high outgoings and many ways the cost of production was increased as well as the cost of labour. Again, with foreign joinery, a great deal of stuff went otherwise go to waste was crined into mouldings and different portions of raw material, though it was as manufactured goods. All that did away with waste. Still the cheap foreign article was the result of cheaper labour as compared with British labour. He read with what had been said about apprenticeship, and he thought workmen themselves were beginning to see the folly of their ways. He had found it much easier recently to get apprentices than it was a few years ago. During the time of good trade, when work was plentiful and men scarce, inferior men, so-called mechanics (really men who had never properly handled a tool) were forced into the ranks of the mechanics and the contractor had to help for it, for the work had to be done and he could not. He was sorry that the trades-unions, though professing to have none of the good mechanics in their ranks, did not see that that rule was carried out, for whatever the unions might say, they could not supply all good workmen. He was amused by Mr. Blashill's remarks about having had access to some of the trades-unions' books of rules, &c., and Mr. Blashill's view that there was little to complain of in those rules. He (the speaker) read some of those rules, and he saw nothing to complain of; but it was not the written, but the unwritten, rule that he complained of—the rule that marked a man if he was more than a certain amount of work. One of the things of such rules, nor of the rule that a workman should dictate what sort of work belonged to him; but those unwritten rules existed among the men, and were carried out very loyally. The result was serious for the country, for it greatly enhanced the cost of building, and superior workmen were held back from getting the position they ought to get, simply because the standard of work was brought down to the meanest capacity instead of being raised to the highest capacity.

Mr. H. R. Taylor, L.C.C., said, as a workman himself, he was very much concerned about one or two of the labour points raised in Mr. Blashill's excellent paper and in the speeches he had already heard. Mr. Blashill had mentioned the old-time method of getting out masons' work, and had referred to excellent character of the work. He quite agreed with that, for he had seen some of that work himself, but what it showed was that they were given more time in those days and had better selection of materials than they had at present time. Moreover, men in those days mended and finished their work, and, contently, took more pride in it than did men who had to finish half-a-dozen other men's work in a given time. Then, as to the complaint of the joiner mentioned in the paper

against the builder-employer, who rushed about in a carriage in order to look after works, any man of intelligence would scout that as an argument in favour of doing less work. A workman of any common sense would realise that as possible. Still, the workmen of to-day read what they did not read thirty or forty years ago, and some of them studied statistics, Board of Trade returns, and reports; and they were beginning to understand that the wealth of the country was accumulating far more quickly than the population, and at a far greater rate than the increase in wages. The wealth of the country had doubled within the last twenty-five years, and the population had doubled in fifty years, and he was quite sure that wages had not doubled in twenty-five years. These were points which had to be reckoned with, and it was this that was in the minds of the class he represented. Mr. Blashill had said that short hours and light work seemed to have been traditional in some offices of the past—and the present, he (the speaker) would add. As to the rise in the cost of brickwork, Mr. Blashill quoted from Mr., now Lord, Brassey's paper before the Institute of Architects in 1878. The fact that work estimated to cost 21. 17s. or 31. 3s. per rod actually cost 51. was all very well on the face of it, but one had to consider the conditions under which the work was done. In all probability the work which had previously been carried out for 21. 10s. was a straightforward job, which made a great deal of difference. A great deal of the increased cost of work was due to a want of management, a want of organisation on the part of the builders' representatives themselves. Another point mentioned in the paper was that the unions did not allow piecework, with the object, it was said, of obtaining the largest amount of pay for the least number of hours worked. That was the result of the inevitable swing of the pendulum. He remembered when one or two men were paid an extra halfpenny or penny an hour to rush the work along, and the policy adopted by the employers in those days to get as much work for as little wages as possible had had its result in this reaction. He would not defend loitering, malingering, or idling, and he said that when employers were prepared to pay a standard rate of wages agreed upon by the trades-unions, every workman ought to be prepared to do a fair day's work. Among every intelligent and sensible body of workmen the loafer or idler was treated with supreme contempt—ignored, boycotted; and when various speakers said that there was an unwritten law in the trades-unions that only a certain amount of work should be done, he challenged the statement, because nothing of the kind had ever occurred with the knowledge of the unions. If any one could bring a case of the kind before any union he was quite sure the unions would deal with the man or men. [A voice: Are you speaking of work in the shop or on the building?] Of work on the building. As to adopting the principle adopted by the Chicago plumbers, he strongly objected to it, and he believed the majority of them would object too. That system would encourage the old tendency to scamp work, which, they had practically settled, they would not put their hands to under any consideration. If the Chicago system were instituted here, he was convinced it would militate against the best interests of the employers and the public. As to the sub-division of labour and the disputes about the demarcation of trades, he said (and he had often got into trouble for saying it, though that did not matter) it was not the business of the unions to decide what was this man's work and the other man's work. That was his own opinion and not the opinion of the unions. So long as men were working under one set of conditions and in receipt of the same rate of wages, it was the employer's business to decide what man should do this work and what men the other work; and if he were working on a job he would not mind if the builder put a carpenter to lay bricks and a bricklayer to hang the doors, for the builder would soon find out his mistake. He thought that such disputes would in time fritter out, and the time was not far distant. As to strikes and lock-outs, he agreed with Mr. Chatfield Clarke that the trades-unions and employers should pull together. He had always condemned strikes and lock-outs under any circumstances, and he believed if the unions and the employers could meet oftener, much good would be done. There was good reason

why, as mentioned by Mr. Randall, cement, steel, and glass were being sent over here by foreign firms. It was not because the British workman wanted higher wages, because a deputation consisting of ironmasters and employers in the metal industries, went over to Germany and Austria, and found that the workmen were getting higher wages, and were working under better conditions than the men employed in the same industries in this country. As to sub-contracting, he was convinced that if there were any attempt made to reintroduce the practice of sub-letting, so far as labour was concerned, it would lead to considerable difficulties with workmen and their employers. He agreed that the apprenticeship system should be reintroduced as far as possible, and he was convinced that if the masters would meet the unions on the subject it could very soon be satisfactorily settled. It was far better than the present system, which made it possible for young fellows to get on the field with a speculative builder and then endeavour to get on to a contract job and so into the trade. It was asked what advantage it had been to the workman to get increased wages, for the workman of to-day seemed the same, or not so good, as the workman of twenty-five years ago. Let them fairly compare the workman of to-day with the workman of the past, and they would see a great difference in favour of the modern man, and he hoped the men would go on improving in the same way. One speaker had referred to the number of men he saw loitering about on Mondays. No doubt those men ought to have been at work, but who knew but what they had been stopped on Saturday and were out looking for work on the Monday? There was very little of St. Monday now as compared with twenty years ago. Mr. Bartlett had said that the amount of work men did was regulated by what the slowest worker on the job did. That was not his (the speaker's) experience, though it might be so in some cases, and where true it did not reflect on the workmen as a whole; a few instances ought not to be taken as an indication of a common practice. It had always been the practice when he had been working for the younger men to do more than their share of the work where there were old men, so that the old men might keep up with the work. Much as the workman might be complained of, it must not be forgotten that he was just what the employers—the general public and the architects, the conditions, training, and education—made him, and those who were so ready to slate the workmen were generally those who had done nothing to raise him to the position it was said he ought not to be in. If the employer and workman could come together more frequently and discuss questions at issue, they would get on a great deal better and make more progress.

Mr. W. Woodward said he was amazed at Mr. Taylor's speech. Mr. Taylor had traversed the statement that there was no limitation of output by workmen, and that so astounded him that he must ask: Did Mr. Taylor state positively, as his honest conviction, that there was no unwritten law whatever in reference to the number of bricks a bricklayer should lay per day?

Mr. Taylor: Yes; I am quite certain of that.

Mr. Woodward, continuing, said he was astounded. He had heard the complaint from more than one builder, and he understood that some of the men, when spoken to on the subject, said:—"Well, you see; I am not allowed to lay more than about 470 bricks a day, and if I do, it will be made very warm for me and I shall not be allowed to lay bricks to-morrow." Mr. Taylor's remarks were contrary to one's experience. All that was asked for was a fair day's work for a fair day's wage, and what had the increased wealth of the people being out of proportion to increased wages of the workman to do with that? It was all a matter of contract—so much wage for so much work. It was the same with an architect, or any one else. An architect did not grumble at his remuneration because the client was making his thousands and he was only making his tens. If the percentage he was paid was not enough, he told the client so, and could decline to do the work unless he got higher remuneration. As to loitering on the job, he was equally astounded at Mr. Taylor's remarks, for the practice was so common—at all events while trade was brisk; the men practically said, "You cannot do without

us." Now, however, that trade was waning, the men were being brought to their senses, and would, no doubt, in time do what was expected of them under a contract. In regard to the question of which trade should do certain work, it was a question of considerable importance. A stone template was required to be laid the other day, and the bricklayer was not allowed to lay it, and the mason had to be taken from his work some distance off to come and put the template in its place, and then the bricklayer went on. Mr. Taylor minimised this, but such things were constantly going on, and while they did there would be a want of sympathy with the workman to the detriment of architects, builders, and employers. Take the question of workmen's dwellings. Why was it that they could not be built to give a profit to the man who built? Not the enhanced price of materials, but the organised idleness of the workmen. The facts they had heard that evening about foreign competition ought to bring the men to their senses, for trouble was bound to arise when the trade had left the country and men were idle of necessity. The other day the bricklayers struck on one of his works because a drunken bricklayer was not allowed to come on to the work. Fortunately, he was able to get other bricklayers from the country and the work proceeded; but just think of the facts! An accident to the drunken bricklayer might have cost the builder 150*l.* under the Workmen's Compensation Act. Surely all this ought to engage the attention of all serious-minded men.

The chairman said there were still several other gentlemen who desired to speak, but at that late hour the discussion would have to be adjourned until that day fortnight, March 25. The meeting then terminated.

Country Meeting at Southampton.

It has been decided, on the invitation of the Hampshire, Dorset, and South Wilts Provincial Committee, to hold the next Country Meeting at Southampton, on May 30 and 31. The first day will be devoted to Papers and Discussions, with a Dinner in the evening; the second day to Excursions to various places of interest in Southampton and its neighbourhood.

ANCIENT BUILDINGS.

At the Carpenters' Hall on Thursday evening last week, Mr. John Slater delivered a lecture upon "Ancient Buildings." The chair was taken by Mr. C. Bird, the master of the "Elers' and Bricklayers' Company, and the lecture was illustrated by lime-light views. Mr. Slater took his hearers along the pathway of time to a very remote period. He said that the ancient inhabitants of the world, after vacating caves, built themselves structures of wood, the roofs being composed of trunks of trees. These structures had later been imitated in stone dwellings, particularly in regard to the roofs, a representation of the trunks being carved in stone. He dealt first with the buildings of the Egyptians, commencing from 3,000 B.C. He remarked that stone was almost exclusively used in this part of the world, and he showed photographs of the pyramids. The Egyptians built for eternity, and their structures which remained created wonder by their solidity and massiveness. He showed a section of the pyramid of Cheops, and explained how the tomb was placed in the centre and the main passage blocked up with stone, so that the body should not be disturbed for 3,000 years. The tomb of Beni Hassan, erected 2,500 B.C., was also illustrated, and he pointed out that this was a prototype of the Greek Doric order. He next referred to the temple of Karnac at Thebes with its 134 columns, and to the temple of Isis, Philæ, which he considered was lighted by means of openings in the top of the walls. In Asia there was a different race of ancients and different materials. There was no building stone at hand and the early structures were made of sun-dried bricks, but notwithstanding this some most important discoveries had been made in recent years, by means of excavations. The discoveries at Ninevah by Sir Henry Layard, Sir William Rawlinson, and others showed that the buildings were composed of different stones placed unsymmetrically and each coloured differently. The palace of Khorsabad was a remarkable structure and must have been ablaze with rich colour, as the people of

this time were adept in the manufacture of glazed tiles and used them extensively. On each of the steps leading to the palace there was a figure of a man exceedingly quaint and mythical. Some remains of beautiful structures in Persia had also been excavated, and the lecturer showed a picture of the ruins of the Palace of Persepolis, with its columns higher than those of the Parthenon. There were as many as from thirty to forty flutings in each column. In conclusion he said that it was quite certain that there were many ancient buildings still buried beneath the dust of the desert, beneath more modern dwellings, or covered by the encroaching sea. Discoveries were still being made, and in Crete, for example, a palace had recently been unearthed, which was of the greatest possible interest. Some ancient buildings had also been discovered in Mashonaland, and over the whole face of Egypt enthusiasts had come upon relics of remote civilisation, and seen that in skill and knowledge of building the ancients were giants in those days.

The chairman moved a vote of thanks to the lecturer, and remarked that the modern builder, unlike the ancient Egyptians, did not build for eternity.

The vote was then carried.

ARCHITECTS' BENEVOLENT SOCIETY.

The annual general meeting of the subscribers and donors of this Society was held on Wednesday in the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, W., Mr. William Emerson, President, presiding.

The minutes of last meeting having been read and confirmed, the following report of the council was read:—

"The council of the Architects' Benevolent Society, in making their report to the contributors for the year of office 1900-1901, have the satisfaction to state that, notwithstanding the many calls upon private benevolence during the period under review, the income has not only been maintained, but increased. Although the society has suffered severely during the last few years by the death of many of its oldest and most generous supporters, its income, through the careful management of successive councils, has not been permitted to diminish; but, on the other hand, the financial progress has scarcely kept pace with the demands on the charity of the society. Last year it was thought that the society's growing needs might be met by the generous response which an explanation of its aims and position would receive at a public dinner; but, in view of the state of public affairs at the time, the project was deferred to a more favourable opportunity. Still, as a special effort was necessary to enable the council to carry on their philanthropic work without rejecting the claims of deserving applicants for relief, the president, with the honorary secretary, undertook to issue a letter of appeal to the members of the profession in the United Kingdom and Ireland, and such a letter was sent out in June last. In view of the large number—some 5,000 architects—to whom the appeal was made, the result was scarcely as favourable as might have been anticipated, but it was successful in so far that it enabled the council to afford a larger measure of practical help where it was urgently needed than would otherwise have been possible. . . . the amount received, or promised, in new annual subscriptions being 98*l.* 9*s.* 6*d.*, and in donations 151*l.* 17*s.*, while the total cost of issuing the appeal was 38*l.* 8*s.* 8*d.*

In connexion with the appeal the Council wish to express their cordial appreciation of the efforts of Mr. E. Monson, who successfully exercised his influence in securing additional subscriptions and donations. Suggestions have from time to time been received by the Council to the effect that the Society would be more liberally supported if its existence and objects were more widely known; but the Council fear that any further promulgation of the Society's aims than at present attempted would place it under a burden of expense without a prospect of adequate return. . . . The Council, at the suggestion of a subscriber, have had also under consideration the desirability of issuing voting papers to members of the Society, and have arrived at the decision that such a system, instead of advancing the objects of the Society, would be a contravention of By-law 68, which states "that the names of persons relieved by the Society shall not be published."

With reference to the society's income account, the Council desire to draw attention to the fact, notwithstanding that the amount received in subscriptions for the year was 522*l.* 0*s.* 6*d.*, as compared with 469*l.* 3*s.* received in 1899, there was a balance at the debit of the account on December 31 of 42*l.* 11*s.* 11*d.* It is the first time in the history of

the society that such a deficiency has occurred, and it is due to the large number of urgent applications for assistance which were considered and relieved. This bears eloquent testimony to the great need of the society for further support. It is hoped that the deficit may be promptly covered by the acquisition of a sufficient number of new annual subscribers.

The number of applications for relief has been greater than in any previous year, being fifty-five as compared with forty in 1899. The sum thus distributed was 677*l.* 13*s.*, while 112*l.* 10*s.* was paid to pensioners, making the total sum expended in relief 790*l.* 3*s.* Two of the Society's pensioners having died during the year, their places were filled by eligible and deserving applicants.

The Council have to record, with great regret, the decease of two distinguished architects who acted as trustees for the Society—Mr. Charles Barry and Mr. Henry Currey. Both gentlemen had taken lifelong interest in the Society, were frequent elected members of the Council, and were always helpful in promoting its usefulness. Other more recent losses were Mr. H. C. Boyes, a member of the Council at the time of his decease, and Mr. D. P. Fordham.

Mr. William Emerson, President of the Royal Institute of British Architects, and Mr. Arthur Cates have been nominated by the Council in election as trustees, to fill the vacancies caused by the death of Mr. Barry and Mr. Currey.

The following gentlemen, being the five members, retire by rotation from the Council: Mr. R. St. A. Rouveret, Mr. W. Woodward, Mr. E. E. Anson, Mr. E. H. Martineau, and Mr. E. T. H. To fill these vacancies and that caused by the death of Mr. Boyes, the council beg to nominate: Mr. Arthur Green, Mr. E. Monson, Mr. Sydney Smirke, Mr. H. L. Florence, Mr. Graham C. Awd, Mr. J. T. Christopher, and Mr. G. H. Fellows Prynn.

The balance-sheet and income account for year ended December 31, 1900, audited by Mr. J. T. Christopher and Mr. Henry Hall, are herewith submitted.

It remains for the Council to thank the Royal Institute of British Architects for office and for accommodation, and its officials for help and courtesy in any matter connected with the Society."

The Chairman, in moving the adoption of the report and balance-sheet, said the Society had existed for fifty-one years, and he did not think it said much for the profession (although it was true it was not a very lucrative profession) that their capital account and annual income were not greater. There were 111 members of the Institute of Architects, 25 out of that number there were only 245 who were donors or subscribers to this Society last year the Society sent out 5,000 letters appeal to architects, and they only had ninety-one in response. This was the only Society that existed to help unfortunate members of the profession, and during its existence had not been able to acquire more than 10,000 of capital. Last year Mr. Arthur Cates shows how inadequate were the subscriptions and donations to the Society from the profession generally; at the same time the Society was grateful to those who had helped them. He felt he must echo Mr. Cates' eloquent appeal for more support—not only from members of the profession, but also from the outside public, for in a sense the public benefited by the work of architects, and there were no doubt many who, if their attention were directed to the needs of the Society, might be disposed to help. But, of course, most of the help should come from members of the profession, and the members of the Institute were to subscribe only one shilling each it would be in double the 42*l.* of debt at the end of last year. It was certainly not for want of a knowledge of the facts, more help was not afforded by the profession and it must be in consequence of an inter-relationship of the unfortunate members of the profession or of a want of *esprit de corps*. If number of applicants went on increasing, funds would be insufficient to deal with cases. That afternoon the council had with eleven cases, and in one or two of them it was impossible to give more than very small sums; more money was needed if the number of applicants went on. He really thought next year some steps should be taken to have a public dinner in order to make the Society better known.

Mr. Macvicar Anderson said he was appointed at the result of Mr. Cates' appeal but he did not think an appeal to the public would do much good. Still, he thought it ought to do more to increase the funds of the Society, and he should be glad to give 50*l.* to cancel the debt; and he would be still pleased to make it 100*l.*, provided nine out

by the end of the year, would give a similar sum, or about twenty others 50*l.* each, so as to add 1,000*l.* to the capital.

The Chairman said he was sure they would all desire to pass a vote of thanks to Mr. Macvicar Anderson for his generous offer; he hoped that the full sum would be obtained by the end of the year.

Mr. Zeph. King seconded the vote of thanks, which was cordially agreed to.

A vote of thanks to the retiring council having been agreed to, Mr. Anderson moved that the following council for the ensuing year of office be elected: President, the President of the Royal Institute of British Architects; Messrs. T. M. Rickman, R. A. Biggs, Arthur Cates, E. A. Gruning, G. T. Hine, Zeph. King, G. Inskip, J. T. Wimpey, Arthur Green, E. Monson, Sydney Smirke, H. L. Florence, Graham C. Awdry, J. T. Christopher, and G. H. Fellowes Pryne.

This having been agreed to, Mr. W. Hilton Nash, hon. treasurer, moved that Mr. William Emerson and Mr. Arthur Cates be elected trustees. He added that Mr. Charles Morrison, an hon. Fellow of the Institute, had just made a donation of roof to the funds of the Society, for which they were very much obliged.

The motion was seconded by Mr. Percivall Currey, hon. sec., and agreed to.

Votes of thanks were then passed to the Hon. Treasurer and Hon. Secretary, and those gentlemen were also re-elected for the ensuing year.

Messrs. J. T. Christopher and Henry Hall were thanked for their services as auditors during the past year, and were also re-elected.

On the motion of Mr. H. L. Florence, seconded by Mr. King, a vote of thanks was passed to the Institute for the use of the rooms and for other assistance.

A vote of thanks was then accorded to the Chairman, who, in reply, said he would be one of the twenty subscribers of 50*l.* if the other sums could be obtained.

The proceedings then terminated.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A lecture was delivered on the 4th inst. before the members of the Leeds and Yorkshire Architectural Society, at the Park-street Rooms, by Mr. Geoffrey Lucas, on the subject of "Logical Building and its Influence on Design." Mr. W. Carby Hall presided. The lecturer declared that the bulk of modern building did not express the deep underlying tendencies of present-day humanity in the same sense that architecture had incorporated such ideas, sympathy, and feelings in the past. Present aims seemed small and commonplace. Of course, good buildings were produced now-a-days, but the great architectural achievements of the lately closed century were almost entirely of a scholarly and archaeological order. Architecture was surely one of the great arts. It was, too, a science, and a progressive one. It demanded a thorough union of construction and adornment. Picturesqueness was a side issue. Buildings had been ostentatiously adorned. That, however, was illogical. What they would like to say of a building was that it was simple and an honest endeavour to meet the requirements involved. Replicas were too common. Truro Cathedral and the Houses of Parliament were not without their grandeur, but they hardly appeared to be in touch with the age. New Scotland-yard, on the other hand, was a vigorous and simple piece of modern work, well suited to the purposes in view. One of the best examples of modern logical building was the new Romanist Church of Westminster, which they might regard as marking the keynote of further progress. The complex conditions under which architects had now to work, the lecturer feared, told against advance. The withdrawal of the architect from personal contact with his work also handicapped him in comparison with his fellow-artificers of old. All details had now to be settled beforehand, and the competition system was another force acting adversely upon architecture as a progressive science. On the other hand, there were not a few advantages pertaining to the architects of the present time. They had the aid of photography, and possessed materials that the ancients could not command. Labour, again, was as plentiful as formerly. If they would advance, it must be on logical lines, purifying architecture of its "Billingsgate,"

and aiming solely at that which appeared true and essential.

ARCHITECTURAL ASSOCIATION OF IRELAND.—A meeting of the Architectural Association of Ireland was held on the 5th inst. in the Grosvenor Hotel, Westland Row, Dublin: Mr. F. Batchelor, President, in the chair. Mr. John Good, Hon. Sec. of the Master Builders' Association, delivered an address on "Some Aspects of the Labour Question as applied to the Building Industry." He said they had doubtless noticed that for many months past newspapers and magazines had been full of accounts of the rapid progress which characterised the century just ended; but while the sum of that progress was vast, yet as compared with other nations we found that we had not improved as rapidly as they had. Not only so, but we had been outstepped by our rivals, and we were no longer the centre of the great world of commerce. What was the remedy for all this, where was the deficiency? We must educate more thoroughly and more efficiently the mechanic who produced the work, as what the public wanted was a good article produced at the cheapest rate, and the nation that met these conditions best would get the trade. The building industry in Dublin was a large one, comprising upwards of 7,000 hands. It was generally recruited from apprentices, indentured and unindentured, for improvers. The indentured apprentice system—a very ancient one—had been found to yield the best results, although it was capable of immense improvement, both in instruction, inspection, and examination. The conditions of apprenticeship varied considerably in the different trades. In the carpenters and joiners' trade the apprentices were principally bound to the employers, and there was no limit to numbers. However, the percentage of apprentices and improvers here was too small, being 22.8 per cent., instead of 33.33. In the second largest skilled branch of the building industry—the stone and bricklayers—the apprentices must be the sons of a member of the trade; but under some circumstances the rule was relaxed on the payment of a 30*l.* fee. One would scarcely have thought that this hereditary or "caste" system could exist in these enlightened days. There were only 3.2 per cent. of apprentices in this trade, and 1 per cent. of improvers—less than one apprentice and improver to every twenty-four men, instead of one to three or four. —the necessary number to keep the trade in a healthy and efficient state. In the plastering trade, where the "caste" system in regard to apprentices also prevailed, and no improvers were allowed, there were 23 per cent. of apprentices, or 8.33 per cent. below the necessary number. In the stonecutting trade, in which, except under extreme circumstances, the "caste" system also prevailed, the percentage of apprentices was 19. In other words, in the entire trade there were 1775 on an average of apprentices, as against the necessary 3333 per cent.—an appalling deficiency of 600 being the result. Thus sufficient men were not being trained to fill the gaps in the ranks, tradesmen were coming from other places to fill the positions, and thousands of able, but unskilled, hands were forced to seek a living elsewhere. The speaker, having pointed out the necessity of a sound theoretical training and practical instruction in those trades in which there were no standards at present, said that this work of technical instruction should be in the hands of a public or Government department, and he trusted the present system would soon be amended through the exertions of the new Department of Technical Instruction, for which they owed a deep debt of gratitude to Mr. Horace Plunkett.—In the course of the discussion which followed, Mr. Beckett said that although Irishmen talked a good deal of republicanism Irish tradesmen were the most conservative people in the world perhaps, and the attempt to confine certain trades to families was doubtless only equalled by the "caste" system in India.

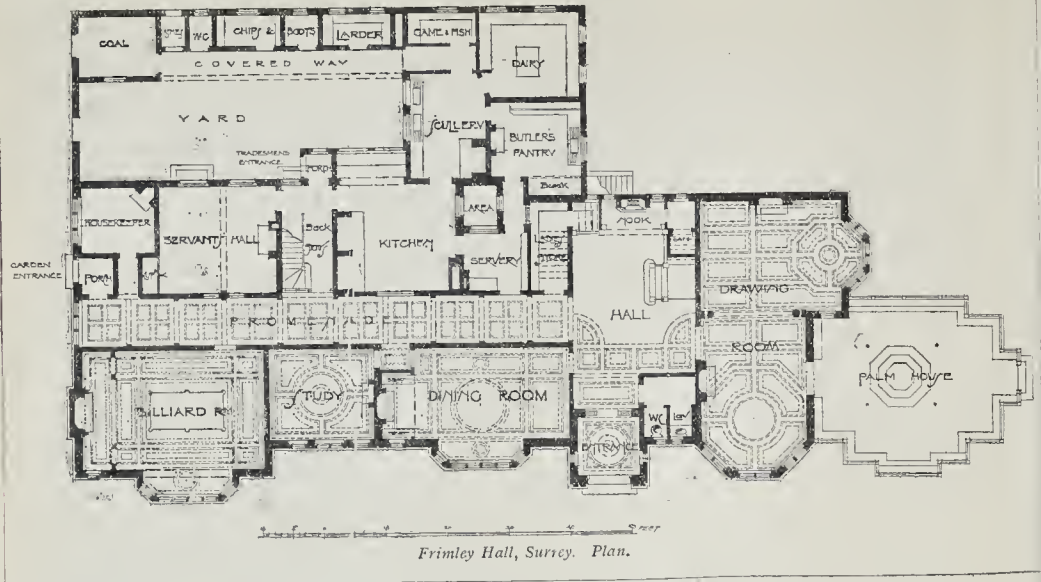
GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—The usual meeting of this Society was held on the 8th inst., Mr. Isaac Low, jun., presiding, when papers by Mr. Jas. McKissack and Mr. Jas. Lochhead were read on the subject of "Planning of Tenements for the Labouring Classes." Mr. McKissack confined his remarks to tenements constructed on the "common close" system, with reference to the arrangement of two-roomed and single apartment houses on the most sanitary and economic principles. The lecturer advocated

the desirability of providing a separate water-closet to each house, and showed suggested plans of such arrangements. Mr. Lochhead's paper dealt with that type of dwelling in which entrance is gained from a balcony at each flat, with common stair placed either outside or within. In planning on the "balcony" system the following points were to be considered:—The staircase should be placed outside preferably, and no bedrooms should overlook the balcony, the scullery or water-closet being placed adjacent to this. The site would require to be fairly level in order that the level balcony might serve a sufficient stretch of building.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting was held on the 6th inst., Sir Henry H. Howorth, President, in the chair. The President submitted to the meeting an address of condolence to his Majesty the King on the death of the late Queen, and of congratulations on his Majesty's accession to the Throne, which was approved.—Mr. C. E. Keyser, F.S.A., described with the aid of lantern slides about 160 examples of sculptured tympana of the Norman doorways of our English churches. There were also exhibited nearly 200 bromide enlargements arranged on the walls and screens round the room. He stated that his object was to take his audience to see as many examples as possible of his subject, and not to enter on a general argument as to the origin of these sculptures or the craftsmen by whom they were executed. He therefore merely gave the name of each example as it appeared on the screen, with a brief explanation of some of the more obscure subjects represented, pointing out two or three groups which had been severally executed in the same workshop. The chief subjects represented were as follows:—Architectural ornament; crosses of various forms, either singly or in groups; trees or foliage, sometimes with animals; the Tree of Life (typifying the Cross) alone or flanked by animals; the Agnus Dei, alone or worshipped by animals; Sagittarius and Leo; St. Michael and the Dragon; St. George at Antioch; the Legend of St. Margaret; Christ with SS. Peter and Paul; the Majesty with Evangelistic symbols; the Majesty borne by angels, typifying the Ascension; the entry into Jerusalem.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on March 6, Dr. W. de Gray Birch, F.S.A., presiding, when the following exhibits were submitted: Some pewter plates of about the middle of the eighteenth century, having an unusual pattern and bearing the maker's marks (spackman's) upon them. The coat-of-arms resembles that of Castile, and probably represents the institution or company to which the plates belonged. These were exhibited by Mrs. Collier. Mr. T. S. Bush exhibited a photograph of a curious circular wooden money chest or box, now belonging to St. Peter's Church, Bristol. The box is 6.4 in. in diameter outside, and 5 in. inside, and is 6.8 in. high to the top of the cover, which is raised or pie shaped. The box is bound with iron, hinged at the back, and has a strap over the cover, with a top plate and ring; the strap is hinged at the front and carried down to bottom band, forming a hasp over the lock plate, which has three keyholes, one on each side of the strap or hasp and one at the bottom smaller than the other two. There is no slit in the top for dropping in coins, and the box was most probably used for keeping money previously collected. The three locks being for the incumbent and the two churchwardens, and the box could not be opened except in the presence of all three. It is said by some people that this curious relic belonged to the Mint at Bristol, which adjoined the church, and existed from 1643 to 1698. The box, however, would seem to belong to the second half of the sixteenth century.—A paper was read by the Rev. H. J. Dukinfield Astley, M.A., hon. editorial secretary, upon "A Ramble Round Thetford," a quaint and fascinating old Norfolk town, or perhaps it should be called "city," for it was once an Episcopal See. An air of unmistakable antiquity seems to pervade the place, as one wanders through the narrow, winding ways and notices the many remains of ancient religious buildings now, alas! demolished, but still bearing evidence in their scattered fragments built up in modern dwellings of the importance of the town in olden times. In the sixteenth century, Thet-



Frimley Hall, Surrey. Plan.

ford possessed twenty churches, besides other religious buildings. Thetford is partly in Norfolk and partly in Suffolk, being situated at the confluence of the little Ouse and the Thet. The Local Authorities of to-day do not appear to possess much regard for the antiquities of their historic town, as in spite of protests, they have recently pulled down the old Guildhall. Thetford has a very ancient history, going far back into the dim and misty past when the devious and winding ways leading down to the riverside were cut through the primeval forest by the old Cuskanian or Iberian hunters of Neolithic days. In later times the powerful and warlike Iceni settled there, and when the Romans came and acquired the Iceni realm they found the place pleasant to look upon, as it is to-day, and there they built a town, generally supposed to have been that known as Sitomagus, an important station thirty-one miles from Venta Icenorum, now Caistor by Norwich, on the direct line of the Ick-nield Way to London—as Antonine Itinerary describes it. The Roman remains as yet discovered at Thetford have been neither numerous nor important, though there is little doubt as to the identification of the site of the Roman town. The tradition of many an ancient battle fought between the Romans, Britons, and Anglians, and afterwards between the Anglians and Danes, still lingers in the rustic mind. The great mound at Thetford, known as the Castle Hill, is said to have been thrown up by the Danes, whose occupation of Thetford was confirmed by Alfred in his treaty with Guthrum, and Thetford became so thoroughly Danish that it is noted as one of those places which never paid Danegeld. It was in the reign of William the Conqueror that Thetford became for a brief period a Bishop's See, and in 1091 the great East Anglian church builder, Hubert de Losing, succeeded as third bishop. He did not, however, long remain at Thetford, as in 1094 he removed the See to Norwich.—In the discussion which followed the paper, Mr. Gould remarked that the tradition assigning the erection of the Great Mound to the Danes is very probably correct, but these mound and court forts were erected by Saxons, Danes, and Normans, and belong to the ninth, tenth, and eleventh centuries. Mr. Compton, referring to Thetford as the site of Sitomagus, considered that undoubtedly Thetford was the site of a Roman station, but he thought that neither Thetford nor Woolpit occupy the site of Sitomagus, but that it is to be sought somewhere else in the neighbourhood. The chairman considered the paper an admirable illustration of the use to be made of archaeological research during a day's outing in the country. Mr. Astley, in replying, mentioned as an undoubted proof of the post-Roman (to say no more) date of the mound and

court forts, the fact that the castle-mound at Norwich, which tradition also ascribes to the Danes, stands right on the track of the Roman road from Caistor to Brancaster, as was ascertained during the course of some recent excavations, when the Roman road was discovered running right across the centre of the mound. A plan of Thetford Priory, several early editions of antiquarian works of the seventeenth and eighteenth centuries, and a fine series of drawings of the old halls and manor-houses of Norfolk, by the late Mr. E. P. Willin, illustrated the paper.

Illustrations.

COMPETITION DESIGN FOR ROYAL INFIRMARY, GLASGOW.

THIS design is the joint production of Messrs. Malcolm Stark and Fred Rowntree, of Great College-street, Westminster, and was submitted in the recent limited competition of London, Glasgow, and Edinburgh architects. The plans show accommodation for 647 beds, with all the usual accessories. The estimated cost was 254,000l.

FRIMLEY HALL, SURREY.

WE give a view and plan of this residence, which was built in 1895 from the plans and under the superintendence of Mr. Huon A. Matear, architect, of Liverpool; Messrs Hughes & Stirling of London and Liverpool, being the principal contractors.

The internal fittings, staircase, and panelling were executed by Messrs. Waring, Gillow, & Co., who also carried out the decoration.

The house is built with Bath stone in quoins, mullions, heads, sills, and string courses, filled in with cement, and dashed with Oporto pebbles. The roof is covered with Ruabon tiles. The floors to all the principal bedrooms and entertaining rooms are of oak.

The principal feature in the house is the staircase and hall, which is carried up two floors, and is entirely of oak.

DESIGNS FOR TEXTILES AND WALL PAPERS.

THESE illustrations are reproduced from designs by Mr. C. H. B. Quennell, architect. Of the textiles, No. 1 is a broadcated tapestry, part in silk and part wool; No. 2, a tapestry wholly in wool. Both are woven by Messrs. Alex. Morton & Co.

Of the wall papers, No. 1 is printed by Messrs. Jeffrey & Co.; No. 2 is a design not yet produced; No. 3 is printed by Messrs. Jeffrey & Co.; and No. 4 by Messrs. Sanderson & Co., of Chiswick.

COMPETITIONS.

STOCKPORT WORKHOUSE INFIRMARY.—At a special meeting of the Board of Guardians of the Stockport Union, held on the 4th inst. at Shaw Heath Workhouse, the award of Mr. Thomas Worthington, F.R.I.B.A., the assessor appointed to adjudge the competitive plans for a workhouse infirmary proposed to be erected at Stepping Hill, was opened. There had been seventeen sets of plans sent in. The competing architects had been informed that the site proposed to be utilised is about 9½ acres; the number of patients to be provided for about 300—males 150, females and children 150; the buildings to be arranged to allow for extension of accommodation when required up to 500 beds; and a separate block for thirty nurses. The Guardians offered three premiums of 1500l., 1000l., and 500l. respectively for the most suitable plans. The assessor has awarded these premiums as follows:—(1) Messrs. Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, London; (2) Mr. H. Percy Adams, Woburn-place, Russell-square, London; (3) Mr. Charles W. Hardy, Rodney-street, Liverpool. All the plans are to be publicly exhibited before anything further is done in the matter.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on Tuesday, March 12, Mr. James Mansergh, President, in the chair, the paper read was "The Aesthetic Treatment of Bridge Structures," by Mr. Joseph Husband, Assoc.M. Inst.C.E. This paper was devoted to the consideration of the aesthetic appearance of bridge structures in general, as resulting from various methods of treatment in design. The opening portion had reference to some fundamental laws of aesthetics which it was desirable to observe in general design, at the same time pointing out the connexion between aesthetic and economic treatment. The effects on aesthetic appearance of the necessity for rapid construction, choice of material, difficulties of site and magnitude of structure were noticed, together with the importance of making allowance for these in criticising completed works. Adverse criticism was shown to be frequently due to comparison with wrong or unsuitable standards, especially in the case of very large structures. The strong connexion between true economy and aesthetics, as evidenced by natural examples, was next mentioned, and the relation of these to artificial structures was considered. General requirements, such as simplicity in design, proper employment of materials, and choice of the most pleasing outline where option existed between two or more economical schemes, were noted, as well as the inadvisability





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INF. PHOTO, SPAGUE & CO. L^{rs} 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



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INK PHOTO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.



bility of attempting to lay down rules for regulating aesthetic design. Some cases existed in which external ornament might be appropriately employed with economy, whilst many others were totally unsuited for such treatment and suffered dereliction if it were allowed; and again, abuse of ornament led to aesthetic failure. Bridge structures in general were, for convenience of consideration, divided into three distinct classes—those built entirely of masonry, those constructed entirely of metal, and those in which masonry and metal both figured. These broadly corresponded to works of small span, large span, and intermediate span respectively. The strong relation between masonry types and architecture was noticed, and the various features of the masonry bridge were considered in detail. The effect on the general appearance of different modes of treatment as applied to the arch-ring, spandrels, piers, abutments, and parapet, was commented on, and several instances were cited in which the observance of the primary laws of aesthetics improved the design without militating against economy. Criticism of masonry structures almost invariably reverted to comparison with architectural standards, often an unfair procedure. Several existing structures were referred to in illustration of the points considered. The second class of structures, consisting of bridges constructed entirely of steel or iron, was subdivided into representative types, each one being considered separately. Emphasis was laid on the necessity of employing a totally different standard of comparison in estimating the aesthetic value of such works, adverse criticism being frequently due to the neglect of this requirement. True aesthetic effect in these structures was due in a much greater degree to a correct observance of the simple and economical design, and the adoption of the most pleasing outline consistent with the conditions, the use of applied ornament being almost aesthetically impossible and economically harmful. Several examples of cantilever, suspension, and arch bridges were referred to and illustrated, as well as lofty viaducts carried on metal piers. The various features each as affecting aesthetic appearance were noticed and cases were instanced in which special difficulties in the way of construction did not prohibit the employment of a pleasing outline, whilst economy in design had been preserved. The most recent examples of large bridge structures were cited wherever possible in demonstration of the points at issue. In dealing with the large-span arch, distinct varieties of outline were illustrated, and the relative merits of each were discussed from an aesthetic point of view. A short notice was devoted to the use of more or less lattice masonry towers in connexion with the steel arch bridge. In the third class of structures were considered large-span bridges employing masonry piers of such magnitude as to exert a considerable effect on their aesthetic appearance, the most successful examples being those from which architectural ornament had been strictly excluded, and in which simple but massive treatment had been employed in harmony with the dimensions of superstructure. In this section were also noted the various types of girder bridges of smaller span, many of which, although possessing little claim to aesthetic value, might yet be deemed more pleasing in appearance by careful attention to several salient features in their design. The paper concluded with a brief notice of the employment of cast-iron ornament in bridge structures, examples being quoted in which its application might be desirable, and others in which, by militating against economy, the fundamental principles of aesthetics were also violated. Instances of its eminently successful application were mentioned, and illustrations were supplied showing the comparative aesthetic effects of the use of cast-iron and steel structural work. The paper was accompanied by forty-seven illustrations and an appendix giving the leading particulars of all important bridges illustrated.

THE INSTITUTION OF JUNIOR ENGINEERS.—The third lecture of the course on "Works Management" was delivered by Mr. A. H. Cooper at the Westminster Palace Hotel on March 7, the Chairman, Mr. Percival Marshall, presiding. Further consideration was given to questions relating to the foundry, including the use of appliances, sand-mixing, compressed air, and hydraulic installations, moulding machines, dressing devices, best relative positions of the different parts of the foundry,

&c. The general scheme of successful works management was then entered upon, the objects to be kept in view being defined. The duty of the manager was discussed, and the directions in which he was likely to fail were indicated.—The next lecture takes place on Tuesday, March 19. On Saturday, March 9, a large number of the members, visited the Southall works of the Brentford Gas Company by the courtesy of the engineer, Mr. J. Husband. They were received and shown over by the superintendent, Mr. W. Bugby, who explained the construction and operation of the carburetted water gas plant, the system of coal gas manufacture by inclined retorts, and the other interesting features of the works. The visit was arranged in connexion with the paper on "Carburetted Water Gas," read before the Institution on March 1 by Mr. Samuel Cutler, jun.

THE LONDON COUNTY COUNCIL.

The first meeting of the newly-elected London County Council was held on Tuesday at the County Hall, Spring-gardens, Mr. W. H. Dickinson, Chairman of the late Council, presiding at the commencement of the proceedings.

Election of Chairmen.—The following gentlemen were elected for the ensuing year: As Chairman, Mr. A. M. Torrance; as Vice-Chairman, Mr. McDougall; and as Deputy-Chairman, Lieut.-Col. Rotton.

The Water Question.—After the transaction of other business,

Mr. T. McKinnon Wood moved:—"That, in view of the decisive verdict of the electors of London in favour of the Council's water policy, a deputation be appointed to urge upon the President of the Local Government Board that the Government should allow the Council's Purchase Bill to pass second reading, and to be referred to a Committee of Parliament."

Mr. Cornwall seconded the motion, which, after discussion, was carried.

The Council adjourned shortly after seven o'clock.

METROPOLITAN ASYLUMS BOARD.

The fortnightly meeting of this Board was held at the Board's office, Victoria Embankment, on Saturday last, Sir E. Galsworthy presiding.

The Works Committee, reporting with regard to the North-Eastern Hospital, recommended the managers to authorise, as an extra on the contract for the erection of the new laundry, the carrying out of certain works necessary for the completion of the roadway and the construction of a new trolley track between the old and the new buildings, and the paving of the space in front of the new coal store, in accordance with the specifications prepared by Messrs. A. & C. Harston, the architects, at the total sum of 394l. The original amount of the contract was stated to have been 8,865l., and the extras previously reported were 761l. The Board sanctioned the outlay recommended.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Greenwich.—The retention of a greenhouse in the garden of No. 11, Kidbrook Park-road, Greenwich, abutting on Hervey-road (Mr. W. Warmington for Mr. E. Edwards).—Consent.

Camberwell, North.—One-story shop-front on part of the forecourt of No. 52, New Church-road, Camberwell (Messrs. N. S. Joseph, Son, & Smith on behalf of the Four per Cent. Industrial Dwellings Company, Limited).—Consent.

Islington, North.—The retention of a gas-meter shed in the playground of the Montem-street school, to abut upon Marriott-road, Islington (Mr. T. J. Bailey for the School Board for London).—Consent.

Lewisham.—Six houses on the east side of Brockley-rise, Lewisham, at the corner of Brockley Park (Mr. J. W. Brooker for Mr. J. W. Webb).—Consent.

St. George, Hanover-square.—A variation from the plans approved on February 25, 1890, for the rebuilding of Nos. 327 and 329, Oxford-street, and

Nos. 85 and 86, New Bond-street, so far as relates to an alteration in the construction of the shop-front to such premises (Mr. W. J. Almond for Messrs. Hitchings, Limited).—Consent.

Dulwich.—A one-story shop on the forecourt of No. 72, Church-street, Camberwell (Mr. W. Seth Payne for Mr. C. Herman).—Refused.

Dulwich.—A one-story shop on the forecourt of No. 74, Church-street, Camberwell (Mr. W. Seth Payne for Dr. W. Morris).—Refused.

Dulwich.—One-story shops on the forecourts of Nos. 68 and 70, Church-street, Camberwell (Mr. W. Seth Payne for Mrs. Clarke).—Refused.

Dulwich.—One-story shops on the forecourts of Nos. 76 and 78, Church-street, Camberwell (Mr. W. Seth Payne for Mr. W. Adams Murphy).—Refused.

Hammersmith.—A detached one-story shop on part of the forecourt of No. 228, Uxbridge-road, Shepherd's Bush (Messrs. Holcombe, Betts, & West for Mr. J. Vellenger).—Refused.

Hampstead.—Buildings on the south side of the portion of West End-lane between West End Green and Honeybourne-road, and on the east side of the portion of West End-lane between West End Green and Fawley-road (Messrs. Boehmer & Gibbs for Mrs. E. J. Cave).—Refused.

Hampstead.—A building, 16 ft. high, on the east side of West End-lane, to abut upon Fawley-road (Messrs. Saltwell, Tryon, & Saltwell for Mr. J. Fryer).—Refused.

Hampstead.—Shops on the east side of West End-lane, Hampstead (Messrs. Saltwell, Tryon & Saltwell for Mr. J. Fryer).—Refused.

Lewisham.—A church on the east side of Trewharry-road, Sydenham (Mr. G. H. Fellowes-Pryne for the Vicar and Churchwardens of Christ Church, Lower Sydenham).—Refused.

Norwood.—Five blocks of residential flats, and a house with a shop on the ground floor, on the east side of Knight's-hill-road, West Norwood, at the corner of Rothschild-street (Mr. H. Bushell for Mr. H. Block).—Refused.

Paddington, North.—A parish hall with a projecting porch, on the east side of Macroom-road, St. Peter's Park, Paddington (Mr. J. S. Alder for Rev. W. P. Legg).—Refused.

Projections.

Islington, East.—That permission be given to Mr. J. Davison to retain a projection (an illuminated sign) at the Queen's Arms public-house, Queensland-road, Hornsey-road, Islington, extending beyond the general line of buildings in Albany-place (Mr. W. H. Fisher).—Agreed.

Woolwich.—Bay windows in front of Nos. 9 to 27 (odd numbers only, inclusive), Elderslie-road, Eltham (Mr. G. F. Logsdail for Mr. A. Cameron Corbett, M.P.).—Consent.

Islington, North.—The retention of bay windows in front of Nos. 10, 12, 14, 16, 18, and 20, Heathville-road, Islington (Mr. R. Midworth for Messrs. Wootton and Green).—Consent.

Marylebone, East.—An iron and glass-covered way at the entrance to Bechstein Hall, No. 36, Wigmore-street, St. Marylebone (Mr. T. E. Colcutt on behalf of Mr. E. Bechstein).—Refused.

Width of Way.

Greenwich.—The erection of a building, to adjoin the convent on the west side of Wellington-grove, Crooms Hill, Blackheath, with a portion of the building and the boundary fence at less than the prescribed distance from the centre of Wellington-grove (Mr. C. E. Mercer and Messrs. F. J. Eadie & Meyers for Reverend Mother of the Ursuline Convent).—Consent.

Hackney, Central.—The erection of a stable on land adjoining No. 47, Bloomfield-street, Dalston, with the boundary fence at less than the prescribed distance from the centre of the street (Messrs. Partridge Brothers for Mr. Yates).—Consent.

Wandsworth.—The erection of buildings and a boundary fence at Gothic Wharf, Frewhouse-lane, Putney, at less than the prescribed distance from the centre of the street (Mr. S. J. May on behalf of Messrs. Carlo Gatti & Stevenson, Limited).—Consent.

Hampstead.—The erection of blocks of residential flats on the site of Nos. 6 and 7, The Mount, Hampstead, with the forecourt boundary or fence at less than the prescribed distance from the respective centres of The Grove and a public footway leading from The Mount to The Grove (Mr. C. W. Matthews).—Refused.

Width of Way, Lines of Frontage and Projections.

St. George, Hanover-square.—The erection of an iron and glass shelter at the entrance to No. 46 Dover-street, Piccadilly (Mr. J. T. Martin on behalf of Mr. M. W. Carmichael).—Refused.

Hackney, Central.—The erection of an addition to a church on the north side of Pembury-grove, Lower Clapton, at less than the prescribed distance from the centre of the street (Mr. J. W. Dunford on behalf of the trustees of the church).—Refused.

Width of Way and Space at Rear.

Marylebone, West.—A block of buildings, to be inhabited by persons of the working class, on the east side of Ashland-place, St. Marylebone, to abut also upon Paradise-street, at less than the prescribed distance from the centres of those streets, and with

an open space at the rear (Mr. T. H. Watson on behalf of the Portland Industrial Dwellings Company, Limited).—Consent.

Westminster.—A building on the south-east side of Moreton-street, Vauxhall Bridge-road, Westminster, at less than the prescribed distance from the respective centres of Dean's-place and Garden-street, with an irregular open space at the rear (Mr. R. S. Ayling for the Brabazon House Company, Limited).—Consent.

Width of Way and Construction.

Holborn.—A play-shed at the school in Rosebery-avenue, Holborn, at less than the prescribed distance from the centre of Poole's-buildings (Mr. T. J. Bailey on behalf of the School Board for London).—Consent.

Cubical Extent.

Rotherhithe.—The erection, on the south side of St. Thomas-street, Rotherhithe, at the corner of Great Maze-pond, of a warehouse to exceed in extent 250,000, but not 450,000, cubic feet (Mr. P. Currey on behalf of Messrs. Tebbitt Brothers).—Consent.

Means of Escape from the Top of High Buildings.

Westminster (detached).—Means of escape in case of fire on the eighth and ninth stories of a block of buildings known as Park Mansions, on the south side of High-road, Knightsbridge, between Brompton-road and Knightsbridge Green, for the persons dwelling or employed therein (Mr. G. D. Martin for Messrs. A. Kellett & Sons, Limited).—Consent.

Line of Frontage and Construction.

Deptford.—A covered way at the rear of No. 100, Beakspers-road, St. John's, Deptford, to abut upon Glensdale-road (Mr. W. T. Barlow for Mr. C. E. Combe).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. D. & R. Kennard, refusing to sanction the formation or laying out of a street for carriage traffic out of the east side of Eliot Park, Blackheath.—Agreed.

Pekham.—That an order be issued to Mr. J. E. Lamerton, refusing to sanction the formation or laying out of a street for carriage traffic, to lead out of the west side of Honor Oak-rise, Forest Hill-road, Camberwell, and the widening in connexion therewith of a portion of Honor Oak-rise.—Agreed.

Wandsworth.—That an order be issued to Mr. H. Vallianey, refusing to sanction the formation or laying out of two streets for carriage traffic, to lead out of Franciscourt-road, Garratt Green, Wandsworth (for Mr. T. Hailstone and Mr. A. E. Elmes).—Agreed.

The recommendations marked † are contrary to the view of the Local Authorities.

BOOKS RECEIVED.

THE COMPANIES ACT, 1900. By Fairbairn and Wingfield. (Abbott, Jones, & Co.)
HOW TO BECOME A MUNICIPAL ENGINEER.—By J. Freebairn Stow. (The St. Bride's Press. 1s.)

Correspondence.

To the Editor of THE BUILDER.

THE VICTORIAN MEMORIAL.

SIR,—It is gratifying to find that you have taken up this important national question, and millions will agree with your deduction that "what we ought to have as a memorial of our late beloved Queen is a great architectural and sculptural monument, for which there should be a competition open to all British artists."

This architectural and sculptured monument should, I contend, have other *raison d'être* for its existence over and above its artistic beauty, and it would not be inopportune to point out why a sculptured monument, pure and simple, would be inadvisable—nay, I venture to say, unsuitable. We have raised such to commemorate disasters and achievements in naval and military warfare, as in the Nelson monument in Trafalgar Square and the Duke of York's Column, not to mention others, all useless enough and not beautiful; while for sculptured figures nearer the eye, the climatic conditions and our coal-consuming custom soon render them objects of positive disfigurement, entailing a constant outlay in cleaning, by which process they must lose any of the artistic qualities they may have originally had.

To raise a work on a colossal scale which should be unaffected by such conditions we should require a site from which the work could be seen from a distance; and then, I fear, such is the art education of the masses, that they would make pilgrimages to the base with field-glasses in order to discern the ornament, if any, on the edge of a garment.

If the provincial towns one and all want a sculptured effigy of the great Queen, by all means let them have it, but London—the city of the

world—wants that and something more. The Victorian monument must not be one commemorating war or disaster to ourselves or others, for it was during the Victorian reign that the arts of Peace were enabled to progress, that science and knowledge advanced, that commerce and industry increased, and that the civilising of the whole world to the glory of God advanced more rapidly than in all previous history. It must be a monument of a humanitarian people.

Speaking as one of the orthodox faith, I would not care to do more than draw attention to a far more serious mistake which might be made, in robbing such a monument of a truly national character by investing it with a particular religious phase, even if it be the state religion. We dare not overlook or ignore the fact that the great Queen Victoria ruled over millions of our brother citizens whose affinities have been drawn closer together by the greatness and wisdom of her reign, and by intermarriage of Catholics, Jews, Nonconformists, Quakers and many others whose religious faiths are so varied as to be almost impossible of enumeration, but in whose hearts lives the spirit of true devotion and loyalty, transferred by the un-failing instinct of right to our Most Gracious Majesty the King and his gracious Consort.

I am sure, Sir, if the matter were placed fairly and without prejudice before his Majesty he would, with his characteristic judgment, consider the matter, and do that which would meet with the sympathy and approval of all. There is no hurry, for in this instance the old proverb holds good "the more haste the less speed." GEO. C. HAITE.

* * Mr. Haite's remark as to the mistake of associating the monument with any special form of religious faith is perfectly true, and forms another reason against the Westminster Abbey chapel scheme.—ED.

THE LONDON WATER QUESTION.

SIR,—I am greatly interested in your article with reference to the London water question.

May I suggest that the best solution of the difficulty would be to fix a meter to every house (as you advocate), and at the same time to fix a minimum charge, *viz.* let every house pay for, say, 25 gallons per head per day, and for so much more (if any) as the meter registers.

Of course, there are drawbacks to every scheme. A tenant will still waste the water if the landlord has to pay, and people will water their gardens and indulge more in cold baths during a long spell of hot, dry weather than when it is chilly and wet.

I think the consumers (and not the landlords) must be made to pay directly for the water, and the latter difficulty might be met by doubling the rate chargeable for water consumed above the minimum during the quarter from Midsummer to Michaelmas.

It must be borne in mind that, for the next few years at any rate, the water supply will require husbanding during long droughts.

OSBORN C. HILLS.

* We did not exactly do that. We said it was a point to be considered seriously; that it would save all the expense and friction inseparable from official supervision; and that if there were insuperable objections to it we had not yet heard of them. We quite recognise that there may be serious difficulties connected with supply by meter.—ED.

PAINTINGS IN ALDERMASTON CHURCH.

SIR,—Your readers may be interested to know that the painting which has been proceeding on the east wall of Aldermaston Church for many months is now approaching completion.

Figures of Our Lord enthroned, the Virgin, and St. John Baptist, with angels, occupy the space immediately below the roof, while on the wall on each side of the east window appear figures of patriarchs, prophets, saints, and martyrs.

The painting is on the wall itself, executed in a wax medium, and with a palette I have restricted with a view to permanence. The old fourteenth-century diaper discovered in the transept by Mr. C. E. Keyser, F.S.A., and myself some years ago has been used as the basis of decoration in the chancel.

It may be valuable to mention that the method of preservation I adopted at the time of discovery has been completely successful. Besides the large fourteenth-century St. Christopher, a portion of a fifteenth-century picture of uncertain subject but fine style, and under an interesting canopy, has not further disintegrated, though the latter work, painted over the fourteenth-century diaper and forming a palimpsest, I found extremely difficult to retain upon the wall.

PHILIP H. NEWMAN, R.E.A.
P.S.—I dare say it needs but recalling to recollection that the transept alluded to contains the exceptionally fine sixteenth-century tomb of the Forders.

ROYAL ARCHAEOLOGICAL INSTITUTE.—The annual meeting this year will be held at Nottingham, from Tuesday, July 23, to Tuesday, July 30.

The Student's Column.

SANITARY FITTINGS AND PLUMBING
10.—BATHS.

BATHS are made of zinc, copper, sheet-steel, sheet-iron, cast-iron, enamel, fireclay, slate, and marble, and also of wood, either naked or lined with lead, but probably cast-iron is more used in this country than all the other materials put together. It is cheap, durable, impervious, and can be cast with widely-rounded angles and in a variety of forms either for standing exposed or for enclosing in wood.

Exposed baths are generally known in the trade as "Roman," and can now be obtained in almost any material. They are much to be preferred, as a wood enclosure not only renders access to the pipes more difficult, but also provides in many cases a convenient harbour for dirt and vermin. Baths are commonly 5 ft. 5 ft. 6 in., or 6 ft. long, but smaller sizes are made for children and others. The sides may be either "parallel" or "taper," and generally slope inwards towards the bottom; the foot of the bath is frequently vertical, while the head has a long slope. The object of the sloping head and sides is to reduce the quantity of water required, with the further advantage of producing obtuse angles, which can be more easily kept clean than right angles.

Baths are generally fixed by the waste and supply pipes, and if space can be afforded, it is a good plan to place them quite clear of the walls or with only the head or foot near a wall, as such arrangements admit of the floor of the room and the sides of the bath being kept clean. For hospitals, however, movable baths on wheels are largely used.

1. **Sheet-metal Baths.**—Under this head bath of copper, zinc, sheet-steel, and sheet-iron may be considered. Formerly these baths were made to be supported on wood cradling, which was concealed by a wood enclosure, but many are now made with roll edges and sufficiently strong to stand alone.

The old form of copper bath shown in fig. 1 has a flanged rim for fixing in wood casing the sides weigh 28 ozs. to the superficial for the ends (where the curve adds to the strength) 21 ozs., and the bottom 32 ozs. The total weight of copper in a bath of this design 5 ft. 6 in. long is only 65 lbs. There is a copper waste-well in the centre of the bottom from which a copper pipe 1½ in. or more in diameter leads to the foot of the bath, when a connexion can be made with a lead trap.

Sometimes hot and cold inlets are arranged: the sides of the bath with copper pipes attached as shown in fig. 3. The dimensions of the bath shown in fig. 1 are as follows: Length, 5 ft. 6 in. inside, and 5 ft. 9 in., outside length; width 24½ in. at head, and 20 in. at foot, inside flange depth, 21 in. inside; height from floor, 27 in. Baths 5 ft., 5 ft. 3 in., and 6 ft. long are also made.

The bath shown in fig. 1 has a flat bottom and the angles are difficult to keep clean. It better to have the angles well rounded, as in the steel bath (fig. 3). In the best modern bath only three sheets of copper are used (for the head, body, and foot), each being bent or pressed to the necessary curves. These are a great improvement on the old form. In cheaper bath one of the form shown in fig. 1 the sides and end are of sheet-steel or iron, the bottom only being of copper. This reduces the cost about 40 per cent., as copper is, of course, an expensive metal; but a cast-iron bath is better than composite bath of this kind.

When copper baths are to be fixed with wood enclosure, the flat flange at the top is replaced by a copper bead, or fitted with hardwood bead, and the bath is japanned on sides or finished in some other way. Sometimes a roll-edge of nickel-plated brass is used instead of the copper or hardwood bead.

Copper baths may be finished in a variety of ways. The surface of the copper may be "planished"; this has a good appearance, but is difficult to keep smooth and bright. The cheapest finish is obtained by japanning in plain finish, either white or (say) pine green, has the best and cleanest appearance. If the japan is polished to give smoother surface, the cost is slightly increased. The cost also varies according to the number of coats applied. A slightly more expensive finish is obtained by metallic-enamelling, the process being practically the same as japanning, and consisting in the application

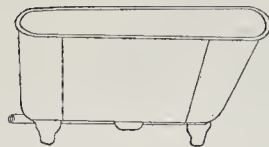


Fig. 1.

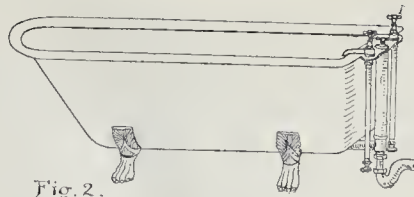


Fig. 2.

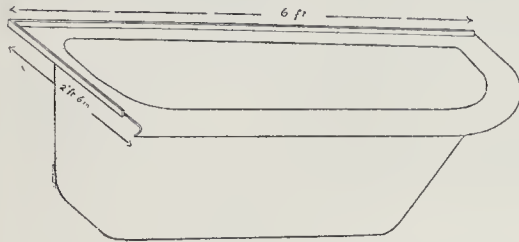


Fig. 4.

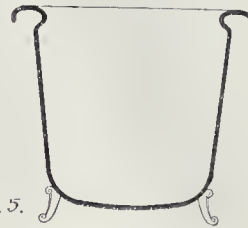


Fig. 5.

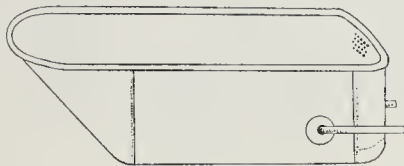


Fig. 3.

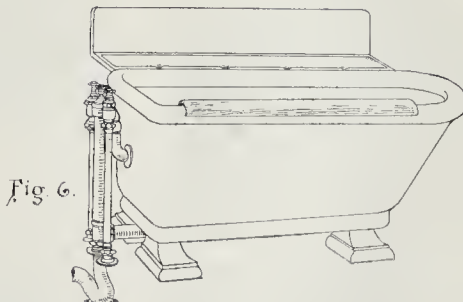


Fig. 6.

Illustrations to Student's Column.

successive coats of a metallic (generally zinc) paint, each of which is burnt on to the metal at the necessary temperature. Three or four qualities of metallic enamel are quoted, the price varying according to the number of the coats and the smoothness of the finish. Before the metallic enamel is applied the copper is generally tinned, as this gives a better result. Tinned copper baths are often polished or highly polished. The appearance of a new bath of this kind is very pleasing, but it is difficult to keep the surface clean and bright. The coat of tin is generally obtained by dipping, but in some cases sheet tin is used and united to the copper by hydraulic pressure.

There can be no doubt that copper is an excellent material for baths. The metal is thin, and does not therefore abstract much heat from the water; it is also durable and can be repeatedly re-enamelled, and when the bath is ultimately worn out it will fetch a good price on account of the intrinsic value of the metal. Perhaps the principal objection to copper baths is that the first cost is so high.

Fig. 2 shows an "Indurated Wood Fibre" bath, lined with highly-polished tinned copper. The top has a French-polished wood capping, and the bath is supported on cast-iron feet.

Cheaper baths of similar design and dimensions to that shown in fig. 1 are made of zinc (plain or japanned), and sheet-iron (galvanised or tinned), with beaded or flanged tops. A sheet-steel bath (Braby's "Eupress") is shown in fig. 3. The plates are riveted together, the rivets being flushed inside, and the whole bath is galvanised after manufacture, and afterwards japanned or metallic-enamelled. The angles are well rounded, and as the baths are light and tough and "nest" closely together when packed, they are very suitable for export.

The parallel plate zinc bath (fig. 4) is made

of plate zinc $\frac{1}{8}$ in. thick, and has a roll edge on the front and head, and a square raised rim on the back and foot for fitting in the angle of a room. The waste is formed with an ordinary plug and washer with bent union, and an ordinary overflow can be fitted in the end. The surface may be either polished or japanned. Polished zinc is difficult to keep clean, and it must not be forgotten that some waters have a solvent action on the metal, and where this is the case it must be protected by enamelling.

Sheet-metal baths for hospitals are furnished with rubber-tyred wheels, and are fitted with plugs and washers or draw-off cocks, so that the baths can be emptied over floor channels or gullies. Tinned copper is the best material for the purpose, but other metals are also used. The indurated wood fibre baths lined with tinned copper are adapted for hospital use by mounting them on wrought-iron carriages with rubber-tyred wheels. A lip is formed around the inner edge of some hospital baths to prevent splashing while the baths are being wheeled about.

2. *Cast-iron Baths.*—Cast-iron is cheap, impervious, and stiff, and can be moulded in a variety of forms. The objections to the material are that it is somewhat heavy and liable to fracture, and that, in the inferior kinds, at any rate, the enamel is rather easily chipped off, thus exposing the metal to the water and air, which cause it to rust. The latter objection loses some of its force if the bath is "vitreous-enamelled," as the process of manufacture ensures a close adhesion of the enamel and iron. For a long time this enamel could only be applied to the inside of the bath, but after many experiments it has been found possible to apply it both inside and outside, and the best cast-iron baths are now made in this way. Cheaper baths are japanned or metallic-

enamelled in the manner already described. The vitreous enamel is not only smoother and less pervious, but is not acted upon by inferior soaps or by the acids and salts sometimes used by bathers, which is more than can be said for the ordinary japan or metallic enamel.

The ordinary cast-iron bath is too well known to need complete illustration. It may be encased with woodwork or left exposed. In the former case a simple flanged rim is formed at the top to receive the wood margin. A similar rim is also provided in some Roman baths so that wood margins can be screwed to them, as these are occasionally preferred because the wood is warmer to the touch than an iron roll-edge. The iron roll-edge is, however, more generally adopted. The ordinary roll is an almost exact semicircle, the diameter ranging from about 2 in. to 4 in.; the "Anti-splash" roll (fig. 5) introduced by Messrs. Doulton & Co. is an improvement. Other details will be illustrated in the chapter on bath-wastes and overflows.

3. *Enamelled Fireclay Baths.*—These were first made about fifty years ago, and many have been used. The porcelain enamel is the one great advantage which these baths possessed over those in vogue at the time when the fireclay baths were introduced, but the manufacture of vitreous enamelled cast-iron baths (which have a practically identical surface) appears likely to prevent enamelled fireclay baths being largely used in the future. Fireclay baths are expensive and have undoubtedly certain disadvantages. They are very heavy, a full-sized bath weighing about 5 cwt. or 6 cwt., and the material is so thick and cold, that it abstracts a very large amount of heat from the water. For hospitals, where a "hot" bath is often required for an urgent case, this is a serious disadvan-

tage, as the bath itself remains cold for some time after the hot water is turned into it, and may chill the patient, so that the "hot" bath, instead of being salutary, may be positively injurious. On the other hand, enamelled fireclay baths are strong, clean, and durable, and are easily kept free from infectious taint.

Fireclay baths are made with parallel or taper sides, and in lengths of 4 ft., 5 ft., 5 ft. 6 in., and 6 ft. (outside dimensions), and can be obtained with or without roll edges and enamelled inside only, or both inside and outside. They are sorted into qualities—a common classification being "best," "all but" or "selected second," and "second." The bottom of the bath is sometimes fluted with a main longitudinal channel and cross channels leading into it. The bath shown in fig. 6 is a "Cliffe Vale" Roman bath supported on enamelled fireclay feet, and has a wood rim inserted in the front roll. An enamelled tray, draining into the bath, is fitted at the back between the bath and wall, and forms a convenient receptacle for soap, sponges, brushes, &c.

4. *Other Baths*.—Baths made of slate or marble slabs bolted together have been used, but as they are heavy, cold, difficult to keep clean, and apt to leak, they cannot be recommended. Concrete baths were advertised some years ago, but the material has not proved suitable. Wood has the advantage of warmth, but is unsuitable in other respects. The appearance of lead-lined wood baths is not agreeable, and, as explained in the chapters on sinks, the lead forms into ridges under repeated expansion and contraction, and ultimately cracks.

GENERAL BUILDING NEWS.

BAPTIST CHURCH, LEICESTER.—The memorial stones of the Sunday schools attached to the Robert Hall Memorial Chapel, Narborough-road, were laid recently. The school building will be provided with a lecture-hall and kitchens and classrooms, the whole designed for the accommodation of some 800 scholars. The external elevations of the edifice are to be executed in red sand bricks, and the roof is to be covered with Broseley tiles. The estimated cost of chapel and schools, inclusive of the site, is about 12,000l. Mr. W. Brand is the architect.

ST. CYPRIAN, BROCKLEY.—The Church of St. Cyprian, which has been built in Adelaide-road, at the foot of the Hilly Fields, Brockley, was consecrated on the 23rd ult. The church was designed by the late Sir Arthur Blomfield.

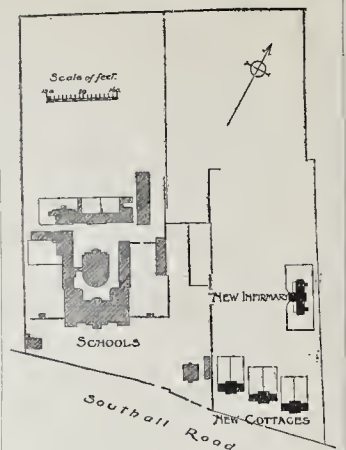
WESLEYAN CHURCH, ARNOLD, NOTTINGHAMSHIRE.—A new Wesleyan church was opened on the 7th inst. at Arnold. The building, which has been erected at a cost of about 2,500l., is situated in Church-drive on a corner site. It is 52 ft. long and 35 ft. wide, and will seat 300 persons. The choir and organ are located in a gallery behind the rostrum, on each side of which are vestries, one for the use of the choir and one for the minister. The main entrance is from Church-drive by means of a lobby communicating with the main aisles. The building is Gothic in style, and has been built of red bricks with Hollington stone dressings. The internal walls have a wood dado to a height of 4 ft. 6 in., and above this are plastered. The internal woodwork is of red deal, stained and varnished. The school buildings (opened some few months ago) are at the rear of the chapel. The main schoolroom is 36 ft. long and 25 ft. wide. There are two classrooms directly at the end, which open into the school by means of movable partitions, thus giving a room 50 ft. long and 35 ft. wide. Entrances are provided, separate for boys and girls. There is an infants' room, 20 ft. by 14 ft., and also a kitchen. The chapel and school are heated throughout by means of hot water on the low-pressure system, so arranged that the chapel and school can be heated as a whole or separately, as may be desired. The builder was Mr. A. Wayne, of Arnold; and the heating arrangements were carried out by Messrs. Tbos. Danks & Co., of Nottingham; the whole work being under the superintendence of Mr. W. H. Higginbottom, architect, of Nottingham.

PUBLIC LIBRARY AND READING-ROOM, NOTTINGHAM.—A block of buildings, erected on Carlton-road in the district of Sneinton, Nottingham, was opened on the 25th ult. as a free public library and reading-room. The buildings cover an area of about 850 square yards. There are two large rooms, each 66 ft. by 25 ft., both one story high. One has been furnished and arranged much after the style adopted at the principal reading-room in Sherwood-street; the other is being arranged for the accommodation of women and young people under the age of sixteen. The outer walls are of red pressed brick with Derbyshire stone dressings. The buildings have a main frontage to Carlton-road, with frontages also in St. Matthias-road and Cardiff-street. On the St. Matthias-road site is a dwelling-house for the caretaker. The architect was Mr. W. B. Starr, and the contractor Mr. W. Maule; while the oak fittings have been supplied by Mr. Henry Haines, and the

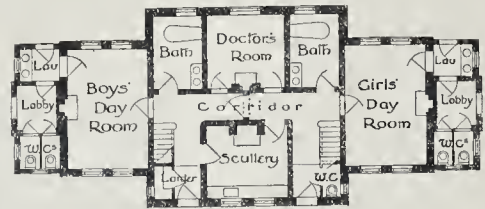
heating arrangements carried out by Messrs. T. Danks & Co.

CATHOLIC SCHOOL, NOTTINGHAM.—On the 7th inst. the foundation-stone of St. Mary's Convent School, Derby-road, Nottingham, was laid. The schools will provide accommodation for 143 infants, 168 boys and girls mixed, and cooking classroom for forty-eight girls, with playgrounds approached by separate entrances from Tunnel-road. The architect is Mr. John Howitt, and the schools are being built under his supervision by Mr. Henry Vickers at a cost of 4,250l.

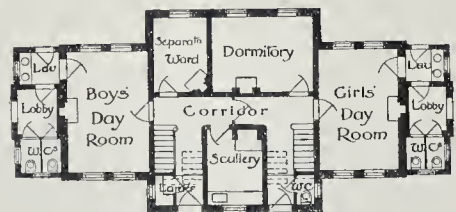
ST. MARYLEBONE SCHOOLS, SOUTHALL: NEW PROBATIONARY WARDS AND INFIRMARY.—The new buildings are erected at the front part of the field on the north side of the school buildings, the three probationary cottages being placed in a line parallel to the public road, and the infirmary adjoining the north boundary. *Probationary Wards*.—With a view of preventing the introduction of infectious diseases into the schools at any time by children taken direct from their homes or elsewhere, it is essential that they should on entry be isolated for a certain period from the other children. This probation allows time for the development of symptoms, and the opportunity of removal to the proper institution before any harm is done. A period of fourteen to twenty-one days is generally considered sufficient probation. It has been found essential, however, to further protect the children during their term of probation from infection by others arriving perhaps within a day or two of their transference to the main school. In view of the great number of "ins and outs" (i.e., cases which are brought in on one day and taken away again by their



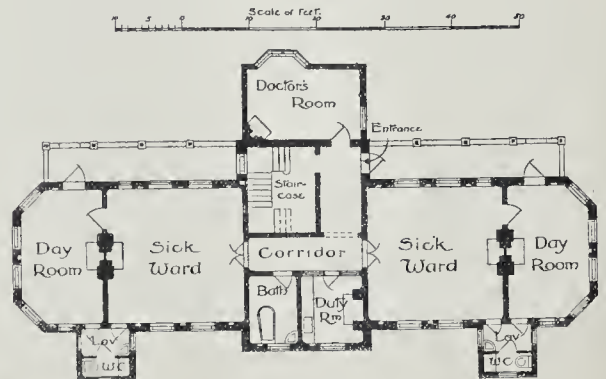
St. Marylebone Schools, Southall: Block Plan Showing Position of New Buildings.



RECEIVING COTTAGE



PROBATIONARY COTTAGE



INFIRMARY.

St. Marylebone Schools, Southall: Ground Plans of New Buildings.

parents or others within a few days, it is obvious that the old system was scarcely really effective. The new buildings are designed to obviate this contingency. On admission children will be taken to the centre cottage or receiving house, where they will be examined by the medical officer in a room provided for the purpose. They will then be bathed, and passed into the adjoining dayrooms, one of which is provided for boys and the other for girls and infants. Between these dayrooms are separate staircases to the upper floors, and a small kitchen. On the upper floor are two dormitories, respectively for boys and girls, and each to hold six beds, a nurses' bedroom, two separation-rooms—each for one bed—and a small overflow ward for either four boys, or four girls, or infants. After a week's probation in the receiving house the children would be removed to the second cottage for a further week, and then to the third cottage for the last week. If at the end of this time they have shown no signs of disease, they will be ready for transference to the main body of the school. The second and third cottages have similar accommodation to that of the receiving house, but no special room for the medical officer. Each cottage is provided with its own lavatories, bathrooms, and water-closets, and each has its separate airing yard, laid out with gravel, and small flower beds near the fences. **INFIRMARY.**—The old infirmary built many years since having become inefficient, and by its situation a source of possible danger to the school generally, the new infirmary has been built with better accommodation designed on modern lines, and placed as far as possible from the school buildings. The building is designed to accommodate a maximum of forty beds in no less than eight separate wards. It is simply arranged with two wings (respectively for boys and girls) containing the sick wards, and a centre part with the usual duty-room, bathroom, &c., and staircase. Each wing contains two wards, respectively on the ground and first floors, and two day-rooms. On an emergency each of these dayrooms can be used as an additional sick ward, with a separate entrance from the outside. The wards will accommodate six, and the dayrooms four, beds each. The duty-rooms are fitted with small range, sink, &c., and the bathroom with porcelain enameled baths and the lavatory basins. The ward offices are contained in two sanitary towers, and are cut off from the wards by cross ventilated lobbies. Two nurses' bedrooms and bathroom are provided on the second floor over the centre part of the building. Water-closets are provided on the south side of the wards. Adjoining the entrance is a medical officers' consulting-room, and above this a sitting-room for nurses. The buildings have been erected from the designs and under the superintendence of Mr. Alfred Saxon Snell, F.R.I.B.A., by Messrs. A. & B. Hanson, of Southall, whose contract for the work amounted to 11,000l. Mr. H. G. Rogers acted as clerk of works. The hot and cold water and gas supplies have been carried out by Messrs. J. & F. May, of High Holborn; tiling by Messrs. Carter & Co., and sanitary apparatus by Messrs. Emanuel & Sons. The quantities and measurements were carried out by Messrs. Northcroft, Son, & Neighbour.

BUILDING TRADE IN ABERDEEN.—The building trade in the city and neighbourhood is still very dull, and the ranks of unemployed masons have been swelled by a large number of men from the monumental granite yards, where work for masons is exceedingly flat, though machine polishings is fairly busy. An improvement on the present slackness in the building and monumental trades is, however, expected in a few weeks. The Town and County Bank have asked 30,000l. for three acres of ground at Clayhill, required for the extension of Aberdeen joint passenger station, and the matter has been referred to arbitration. The Town Council have applied for the requisite permission to borrow the sum needed for the proposed new electric station at Dee Village-road and other extensions.

THE IMPERIAL THEATRE.—In the course of next month the Imperial Theatre will be reopened. The house has been reconstructed for Mrs. Langtry, under the plans and designs of Mr. F. T. Verity.

IMBECILE WARDS, BURNLEY WORKHOUSE.—On the 7th inst. the female portion of the new imbecile wards being erected at the Burnley workhouse were formally opened. The wards when completed, accommodate about 140 patients. The building will be two stories in height. Wards for idiots and epileptics will be on the ground floor, and several rooms are provided for violent and noisy cases. Each class of inmates will be kept separate from each other. The floors will all be fireproof, and the architect is Mr. S. Lightly, Burnley.

HOUSING OF THE WORKING CLASSES AT BATH.—A meeting of the Housing of the Working Classes Committee was held at the Guildhall on the 1st inst., when the Mayor (Mr. T. B. Silcock) was elected Chairman. It was decided to recommend to the Council the plans submitted by the City Surveyor for thirty-nine houses on the Lampard's Buildings site, making provision for 180 persons. It was reported by the Surveyor that 12,035 loads of refuse had been tipped on the Dolemeads site to raise the land for the new dwellings being erected there.

CRABB MEMORIAL INSTITUTE, TUNBRIDGE WELLS.—The foundation-stone of this building was laid on the 25th ult. The building will be of red brick,

with dressings of stone. Messrs. H. H. & E. Cronk, of Tunbridge Wells, are the architects, the builders being Messrs. Leney & Son.

PROPOSED EXTENSION OF BRACEBRIDGE LUNATIC ASYLUM, LINCOLNSHIRE.—It is proposed to extend Bracebridge Pauper Lunatic Asylum. Plans are to be prepared by Mr. Albert E. Gough, of London. The extensions will accommodate 200 additional patients. The cost is estimated at over 75,000l.

TOWN HALL, CHISWICK.—The new Town Hall for Chiswick, which has been erected on the site of the old vestry offices, at the corner of Sutton-road, was opened on the 28th ult. A part of the old building. The work was incorporated in the new supervision of Mr. Ramsden, the Surveyor. The premises are heated by radiators by Messrs. Russell & Russell. The clerk of works was Mr. George. The cost has been about 18,000l.

MISCELLANEOUS.

SOUTH KENSINGTON MUSEUM.—Until further notice the Victoria and Albert Museum will be open to the public till six o'clock on the students' days (Wednesdays, Thursdays, and Fridays), and on Sundays.

ABERDEEN BOROUGH SURVEYOR'S DEPARTMENT.—With a view to lessen the pressure on the Borough Surveyor (Mr. W. Dyack), Aberdeen Town Council has requested its Water Committee to recommend the name of an eminent engineer to guide the Council as to the best source of a new water supply for the city.

HOME ARTS AND INDUSTRIES ASSOCIATION.—The seventeenth annual exhibition of the work done in the classes of the Home Arts and Industries Association will be held from May 10 to 20 in the gallery of the Royal Albert Hall. The exhibition will include specimens of wood-carving, inlay, metal repousse, embossed leather, baskets, spinning and weaving, lace, toys, and rugs, and of habits from the Brabazon and Home Art Scheme for Disabled Soldiers and Sailors. There will also be exhibited other arts and industries. There will also be exhibited Disabling Soldiers and Sailors. There will also be exhibited other arts and industries. There will also be exhibited Disabling Soldiers and Sailors.

THE LATE MR. H. C. BOYES.—By the will of the late Mr. H. C. Boyes, the architect and surveyor to the Grocers' Company, roof has been left to the Architects' Benevolent Society, and the same sum to the Charitable Fund of the Surveyors' Club. There were various other charitable bequests. The value of the estate was nearly 62,000l.

HYDE PARK.—In the House of Commons on Monday Colonel Legge asked the First Commissioner of Works whether it was proposed to remove the remaining iron railings inside Hyde Park; and whether he would consider the desirability of lighting the roadway between Victoria Gate and the Marble Arch.—Mr. Akers-Douglas: It is proposed ultimately to remove all the iron posts and rail fence in Hyde Park except the portion round the ride. I have not at present sufficient funds to meet the heavy expense of lighting the roadway referred to by my hon. and gallant friend. Seeing that there is a public roadway running parallel to it, and within a few yards, it is not so pressing as other changes.

ASSURANCE AMONG THE INDUSTRIAL CLASSES.—The fifty-second annual report of the Prudential Assurance Company states that in the industrial branch the premiums received during the year were 5,447,697l., being an increase of 278,739l. The surplus in this branch is 716,660l., including the sum of 315,853l. brought forward from last year. Out of this surplus the board have added 50,000l. to the reserve fund, which now stands at 82,000l.

HOUSING OF THE WORKING CLASSES.—The Hammersmith Borough Council, on Wednesday evening, decided to adopt Part III. of the Housing of the Working Classes Act, 1890. It was also agreed that a large scheme which the Works Committee have had under consideration for some time past, for the erection of workmen's dwellings on the Council's land near the electric lighting station, Fulham Palace-road, should be proceeded with as soon as possible.

DRIGHTLINGTON SEWAGE.—The Local Government Board have decided to issue a provisional order empowering the Drightlington Urban District Council to put in force the Land Clauses Act for the acquisition of land for sewage disposal works. The inquiry was held on January 30 before Mr. R. H. Bicknell, J. Esq., C.E. The District Council's proposal was strongly objected to by the owner, Sir R. Tempest. The scheme as prepared by the Engineer (Mr. John Waugh, C.E., of Bradford) provided for the whole of the drainage of the villages of Drightlington and Adwalton. The sewage, on arrival at the outfall works, is first treated in two large tanks by means of chemical precipitation, and then run on to four bacteria-beds, the effluent from which is treated on five acres of land laid out on the intermittent downward filtration system. The total estimated cost of the scheme is 12,000l.

REFUSE DESTROYER, BARRY, GLAMORGANSHIRE.—The refuse destructor which the Barry District Council have built at Barry-road, Cadocton, was opened on the 26th ult. The destructor is capable of burning 30 tons of house refuse per day. The plans were prepared by Mr. J. C. Pardoe, the Surveyor to the Council, the work having been carried out by Messrs. Lloyd & Tape, of Barry

Dock, at a cost of 8,000l. The chimney stack, 150 ft. in height, with a lining of fire-brick carried up 125 ft., was built by Mr. J. Prout, of Barry Dock.

BUNTON PAVILION.—A scheme of a very comprehensive character is on foot for altering and extending the buildings in connexion with the well-known Pavilion. The directors of the Buxton Gardens Company have called in the services and advice of Mr. Matcham, architect, of London, who has prepared plans for a main entrance to the gardens, with offices, and beyond that a theatre. The latter will occupy a very large area of ground, taking in the first conservatory, aviary, reading-room, and a wide margin of land facing St. John's-road. The existing theatre will be completely remodelled and converted into reading and billiard rooms, smoking-lounges, and, probably, billiard-rooms. The work is of considerable magnitude, and will have to be carried out in sections after the season of root.—*Sheffield Independent.*

MEMORIAL TABLET, KING'S COLLEGE, ABERDEEN.—A bronze tablet has been placed in the ante-chapel of King's College, Aberdeen, in memory of the Rev. George Cockburn, the pioneer missionary of the Church of Scotland's station at I-chang. The tablet was designed by Mr. Kelly, the sculptor having been Mr. Watt.

SEWERAGE SCHEME, LISBURN.—Mr. P. C. Cowan, Chief Engineering Inspector to the Local Government Board, recently held an inquiry in the Court-house, Lisburn, into a petition by the Lisburn Urban District Council under the Public Health (Ireland) Act, 1878 to 1896, for a provisional order empowering the Council to put into force the provisions of the Lands Clauses Acts for taking certain lands compulsorily for the purpose of providing sewerage works. The Council further asked for sanction to a loan of 23,266l. 12s. 9d. for the sewerage works. Evidence was given by Mr. W. Tennent Henry, J.P., the engineer for the scheme.

CAPITAL AND LABOUR.

THE BIRMINGHAM BUILDING TRADE.—Building operations have considerably slackened in the district of late, and as a consequence nearly a thousand bricklayers and half that number of carpenters are out of work. It is said that employment has not been so scarce in the trade for many years. The reasons given are over-rapid production, high prices of material, and the war.

ABERDEEN PLASTERERS AND PAINTERS.—The plasterers' strike still continues, with no immediate prospect of a compromise. A difficulty as to the working-by-laws in the painting trade has been amicably settled.

LEGAL.

ACTION AGAINST A BUILDING-OWNER.

The case of Bingham v. Turner came before Mr. Justice Channell, sitting without a jury, in the King's Bench Division on the 8th inst., an action by the plaintiff, of 105, Fulham-road, South Kensington, to recover from the defendant, Mr. Everitt Turner, 152l. 10s. in respect of certain ranges and marble slabs supplied by the plaintiff for the defendant's houses at Brighton.

It appeared that the plaintiff entered into a contract with Mr. J. H. Hackman, a builder of Brighton, under which the latter undertook to build four houses in Dyke-road, Brighton, for the defendant, and the question in dispute was whether the plaintiff was entitled to recover from the defendant (the building-owner) or the builder. The action turned upon a clause in the building contract which gave the architect power to decide whether the building for materials supplied by special artists and tradesmen. The architect certified against the defendant, and his Lordship, in the result, held that the defendant was liable and entered judgment for the plaintiff for the full amount claimed.

WHAT ARE DAMP COURSE SLATES?

At the Southwark County Court, on Monday, his Honour, Judge Addison, K.C., heard a remitted action in which Messrs. J. Williams & Co., slate merchants, of Dinorwic Wharf, Rotherhithe, sued Mr. John Cooke, a builder and builders' merchant, of Dorking, Surrey, to recover £31 3s. 9d. for slates sold and delivered. The defendant counter-claimed for a similar amount as damages for breach of warranty. Mr. Woodcock was counsel for the plaintiff and Mr. Walsh represented the defendant.

In opening the case, Mr. Woodcock said the plaintiffs were a large firm of slate merchants. On May 10 last one of their travellers called upon the defendant and asked him if he wanted any slates, as he had one or two cheap lines. Defendant said he could do with some damp course slates, and the traveller then and there booked an order for a truckload of damp course slates. The slates were sent off in due course, and after they had arrived at Dorking a letter was received from the defendant declaring that he had ordered only 1,000 of 18 by 9 and 1,000 of 14 by 9, but complaining that they had sent more than double the quantity of "some mineral substance cut into pieces and resembling

block, the drums and central disc being loosely mounted on a shaft that revolves in eccentric bearings. Each belt may be tightened so as to drive its corresponding drum. When the belts are loosened the shaft revolves so as to disengage the disc and to effect friction between the disc and a pulley upon the driving-shaft, whereupon the two drums will be driven in one direction for winding purposes, but they will be driven in opposite directions when the disc has been lowered on to the brake-block and one of the belts has been tightened.

22,459.—AN APPLIANCE FOR WINDOWS: C. M. Ford (executor of C. C. Mallett) and M. H. Mallett.—Hinged sliding beads or stops (each of which has a handle) are fitted on to the side frames of a glazed "hopper" window so that they can be turned back and admit of the sash being swung into the room for purposes of cleaning it, &c. When the beads are lifted their lugs engage with recesses cut in the frame, and when the beads are caused to slide downwards those projections are forced against stop-faces. When one moves the sash back again into the hopper the hooked supporting rods pivoted on to the frame are turned up out of the way.

22,475.—DOOR LATCHES: F. Bell and J. S. Bell.—The latch-bolt displaces and then falls behind a lever that is pivoted on to the striking-plate of a door or some similar latch. For a striking-plate of a latch-lock adapted for right-hand and left-hand doors a screw is inserted through the other end of the lever, and the lever can be displaced with a handle so that the door may be opened from within, the latch-lock not being used. In the case of a two-bolt mortise lock a channel is made which enables the latch-bolt to operate upon the lever.

22,485.—NOZZLES OR AUTOMATIC SPRINKLERS FOR THE EXTINCTION OF FIRE: L. A. Weston.—A strut, whereof the two parts are secured to one another with a fusible solder, maintains a valve upon its seating. Through the centre of the spreader is passed a screw which carries the upper end of the strut. A staple that locks the two parts of the strut to one another engages underneath a projection upon one of the two parts, and is soldered on to the bottom flange of the other part. At the fusing of the solder, the opening of a spring contributes to force the parts of the strut asunder.

22,514.—CONCRETE CONSTRUCTION FOR BUILDINGS: G. E. Clare.—A concrete which contains clinker, coke-breeze, &c., is filled in the wooden frames of floors, walls, roofs, bungalows, and similar structures. For the parts of a building constructed of concrete, plaster, and timber, the timbers, and boards or tiles are nailed to the walls. The wooden frames may be laid upon a flat surface and filled in with concrete, the sections serving for bungalows. Fillets nailed outside the frame keep the concrete in its place, and a key for plaster will be afforded by fixing lathing strips of metal on to the woodwork. The invention extends to the building up of hollow walls, roofs, and floors, and to the fixing of concrete slabs between the timbers.

23,549.—MANUFACTURE OF CEMENT: J. C. Goshing, J. H. Fraser, and R. Booth.—For drying the slurry and burning it as it is being passed through an inclined rotary kiln, which is heated with an admixture of air and combustible gas or vapour, a hopper turns the cement in its fall from the discharge outlet into spaces, beneath which are arranged shelves, upon which are reciprocating slides that impel the cement into trucks, the motion of the slides being imparted by levers and cams upon the rotating kiln. The containers into which the burned cement is diverted have their walls inside either of a set of tubes arranged like a grid, or of corrugated air-heating boxes, through which air is forced with a fan, its path being lengthened by means of baffle-plates, and so through a pipe to the outlet nozzle.

22,605.—A REGULATOR VALVE FOR WATER-CLOSES: H. L. Doullon.—For regulating the flow from the service-pipe to the flushing-pipe is devised a lift-valve, in whose upper end is fitted a piston within a cylinder that is joined with a time-passage to the service-pipe and to a push-valve with an opening; the working of the push-valve reduces the pressure upon the top of the lift-valve, so that it will rise and effect a flush, after which it becomes slowly closed as water flows through the time-passage; a simultaneous and automatic working will be afforded by attaching the valve-spindle to the working-lever of the closet discharge-valve, a weight upon that lever will serve to close the valve, or the valve may be shut by means of hydraulic pressure upon a piston applied to the lever.

22,616.—SPANNERS: W. Förster.—In order that spanners which have fixed jaws may fit on to differently sized nuts their jaws are provided with filling-pieces; the filling-piece is made of plates strengthened with a web and is secured with a screw through an extension of the web. For turning nuts readily which are close together the plates are disposed so as to project sideways.

22,651.—SHAVE-HOOKS FOR PLUMBERS' USE: W. F. Waylan.—The shave-hook is rendered applicable for use as a gauge and marker, and as a cutter for marking washers as well, by marking its shank with graduated divisions and making the sliding gauge-piece as long as, or a little longer than, the blade which is pear-shaped. If the workman wants to shave or mark the end of a pipe, he presses the gauge-piece up against the pipe-end and draws the

tool towards it or around the pipe; thus the gauge-piece may be employed as a marker upon flat surfaces when the blade touches an edge of the surface, and it will serve for marking disterns when its blade is held against one side; it is also available for cutting round washers of leather, lead, or other soft substances, and can be used as a pair of compasses.

22,641.—AN APPLIANCE FOR USE WITH SLIDING WINDOWS: G. Barnes.—In order that the bottom of the sash may be automatically forced outwards on to the weather-strip as one shuts the window by lifting the bearer, the upper edge of the bearer and the lower edge of the sash are fashioned bevel-wise. See No. 20,799, of 1899, for a specification of the working and holding apparatus of the windows.

22,647.—MECHANISM FOR SLIDING SASHES: A. H. Fisher.—For detaching and fastening the cord a yoke or loop at its end has lateral projections that will engage with inlets cut in a bracket in the sash stile. Two hooks upon a cross-shaft enter the yokes so as to liberate them from the sashes. The hooks when either lifted or lowered lock a handle upon the shaft with a pawl set for engagement with a notched disc at the end of the shaft. The beads are hinged that they may be turned back out of the way, and eyes or sockets attached to the sashes fit over fixed pintles.

22,651.—FIRE-PROOF STAIRCASES: J. A. Willmore.—The cast-iron steps of fireproof staircases (so described) have recesses cut in them for treads of oak, teak, or other material. The treads are fastened with screws driven from beneath them, and sheets of some fire-resisting substance, such as asbestos, are inserted between the metal steps and the wooden treads.

22,671.—A FLUSHING APPARATUS: M. J. Adams.—The inventor has contrived that the depression of the closet seat shall effect a lifting of a bell, and that the fall of the bell shall cause the flush to start as soon as the seat has been freed again. To the rear end of the seat is pivoted a rod that extends through a tube upwards into the cistern so as to impinge against a lever which is pivotted at its one end, and carries the bell at its other end.

22,686.—A SAFETY APPLIANCE FOR LIFTS: U. S. Aze and H. S. Nagengost.—Underneath the cage or car is a frame that holds two pairs of cylinders, of which the pistons are joined to bars that slide between plates respectively; the remoter ends of the cylinders are joined together with pipes and also with an air-compressing pump which derives its action from the motion of the car. Under normal circumstances the cage will descend as a spring air-fall can be arrested through the compression of the air in the cylinders by the pistons as the latter are forced inwards by blocks which are mounted upon the bars and slide in inclined guides attached to the sides of the well or shaft.

22,693.—CALLIPER GAUGES: F. Ullmer.—Of the two jaws of the gauge one is provided with a pointer that traverses a minutely graduated scale, and the other is set to the required dimension by means of another scale and its pointer; the first-named pointer, which travels over a curved scale, has at its wider end a rounded part which is pivotted, and to a slight extent out of centre, to the jaw, on the handle by which the pointer is moved for adjustment is a sector which gears with a pinion upon the eccentric spindle; a variation of the arrangement of the jaws is included in the invention.

22,714.—COMPOUNDS FOR BUILDERS' USE: C. Strath.—For the making of a cement, plaster, or mortar, hydrated aluminium, oxide or bauxite, and slaked lime, are mixed with water. To render the compound fire-proof some mica is added to it, whilst for the bauxite may be substituted gneiss, granite, syenite, crumbled schistose rock, or argillaceous shales, through which water has been caused to percolate for the washing out of the free soda or potash. The granite or other component when in a dry-like condition should be heated in order that it may act upon the lime, and there may be added to the materials such acids and salts as will contribute to the formation of insoluble and fixed combinations with alumina and lime.

22,723.—A COMBINED LATCH AND LOCK: A. Cashin.—A lock, for doors and gates, is contrived with a bolt which will turn upon a pin in order that it may serve for a lift-latch, and will, moreover, slide and thereby serve for a bolt-lock the follower acting upon a pivoted lever or directly upon the tail of the bolt. For raising the bolt, the forward end of the lever is set in engagement with a recess cut in the bolt. In the case of a long recess, or of direct action upon the bolt by the follower, one is prevented from turning the handles after the bolt has been locked, but if a shorter recess is used the disengagement of the forward end of the lever (after the locking of the bolt) causes the turning of the handles to be inoperative upon the bolt. A tumbler or levers retain the locked or unlocked bolt in its place.

MEETINGS.

FRIDAY, MARCH 15. Architectural Association.—Mr. H. B. Measures on "Rowton Houses," 7.30 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Lyndale on "Sanitary Appliances," 8 p.m. Institution of Mechanical Engineers.—Mr. A. N.

Connott on "Combined Trolley and Conduit Tram Systems," 8 p.m.

SATURDAY, MARCH 16.

Architectural Association.—Third Spring Visit, Stanhope House, Park-lane, W., by permission of architect, Mr. W. H. Romaine-Walker, 2.30 p.m. Institution of Junior Engineers.—Anniversary dinner Westminster Palace Hotel, 6.30 p.m. Royal Institution.—Mr. R. P. Taylor on "Lord Rayleigh's Sound and Vibration," IV, 3 p.m. Incorporated Association of Municipal and Civil Engineers.—Home District Meeting, to be held Wimbledon. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destruction Works, Ealing, 2.15 p.m. British Institute of Certified Carpenters.—Visit to the Guildhall, E.C., 3 p.m.

MONDAY, MARCH 18.

Royal Institute of British Architects.—Ninth General Meeting (business and ordinary). (1) Election of candidate for membership. (2) Mr. C. Harrison Townsend on "The Art of Pictorial Mosaic." In addition to lantern illustrations, a collection of specimens and photographs mosaic-work will be exhibited, 8 p.m. Society of Arts (Cantor Lectures).—Major Phil Cardew, R.E., on "Electric Railways," II, 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Lyndale on "House Drainage," 8 p.m. Liverpool Architectural Society.—Mr. Neville Hanson on "The Restoration of Ordsall Hall," 6 p.m. Leeds and Yorkshire Architectural Society.—Mr. Francis Bond on "French and English Abbots," (2) Election of officers and exhibition of Institute drawings, 6.30 p.m.

TUESDAY, MARCH 19.

Institution of Civil Engineers.—Paper to be further discussed:—"The Aesthetic Treatment of Bridge Structures," by Mr. Joseph Husband, 8 p.m. Institution of Junior Engineers.—Mr. A. H. Barkley on "Water Engineering," IV, 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Professor Henry Robinson on "Water Supply: Source of Supply and Distribution," 8 p.m.

WEDNESDAY, MARCH 20.

British Archeological Association.—Rev. W. S. Lacy on "Chaucer as an Illustrator of Medieval English Literature," 8 p.m. St. Paul's Ecclesiological Society.—A paper entitled "Notes on the Brasses of Kent. Part II. Ladies and Civilians," will be read by Mr. Mill Stephenson, F.S.A., 7.30 p.m. Society of Arts.—Mr. Percy T. Macquid on "Evolution of Form in English Silver Plate," 8 p.m. Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the members, 8 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection in the District of St. George, Hanover-square, 2 p.m.

THURSDAY, MARCH 21.

Carpenters' Hall, London Wall.—Professor T. K. Smith on "Westminster Abbey," 8 p.m. Sanitary Institute (Lectures for Sanitary Officers).—Professor Henry Robinson on "Sewerage," 8 p.m.

FRIDAY, MARCH 22.

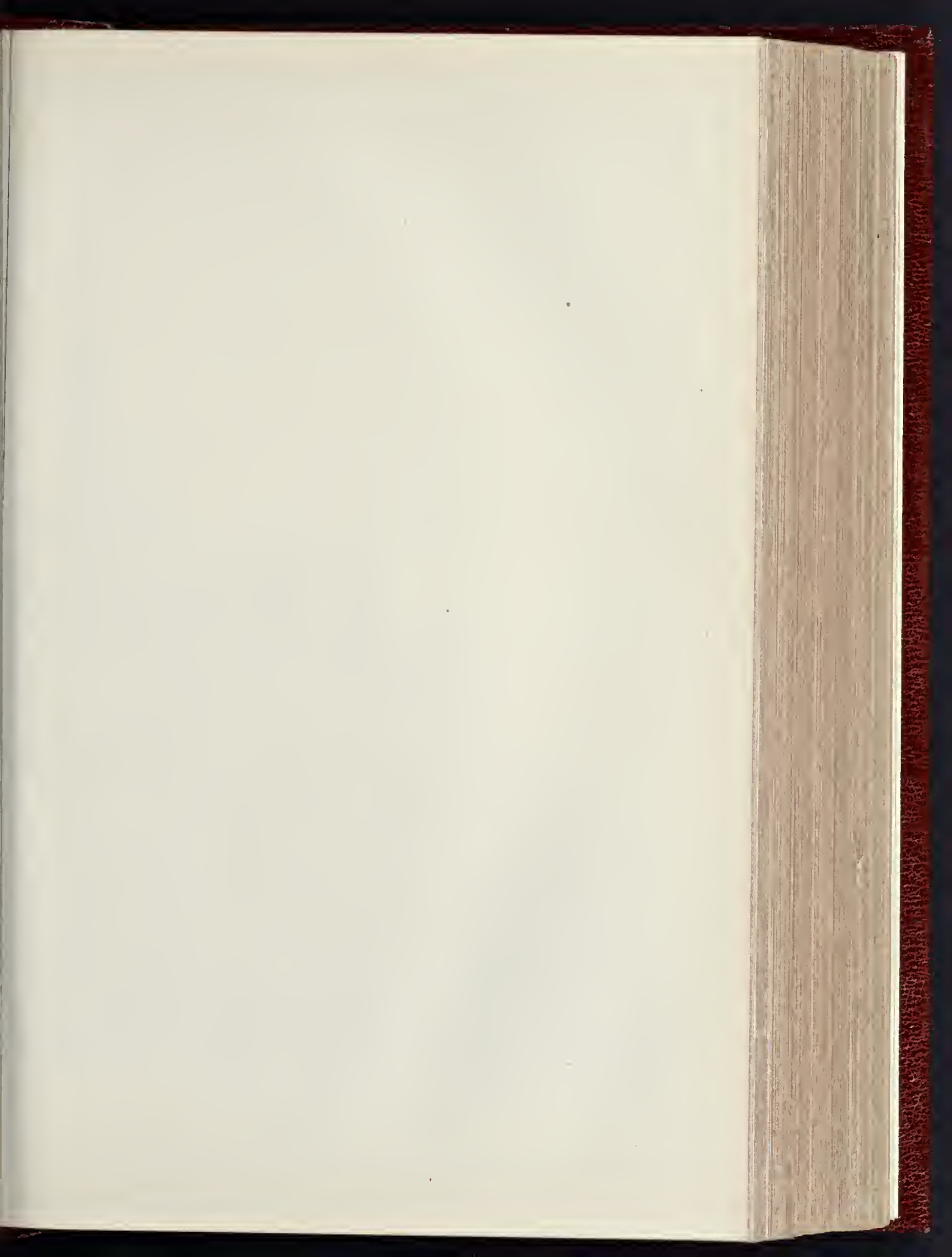
Architectural Association Discussion Section.—Dr. S. L. Croble on "An English Cathedral," 7 p.m. Institution of Civil Engineers (Students' Meeting).—Mr. O. L. McDermott on "The Hunstet Railway, a Bridge over the River Alford," 8 p.m. Institution of Junior Engineers.—(Westminster Palace Hotel).—Engineering Question Night, 8 p.m. Institute of Sanitary Engineers (Incorporated).—Examination in Practical Sanitary Science. Glasgow Architectural Association.—"Temporary Carpenter Work."—(1) Mr. R. Stuart on "Gabb Scaffolds and Crane Seats"; (2) Mr. R. Wilson on "Centering"; (3) Mr. W. H. Baxter on "Temporary Stands," 8 p.m.

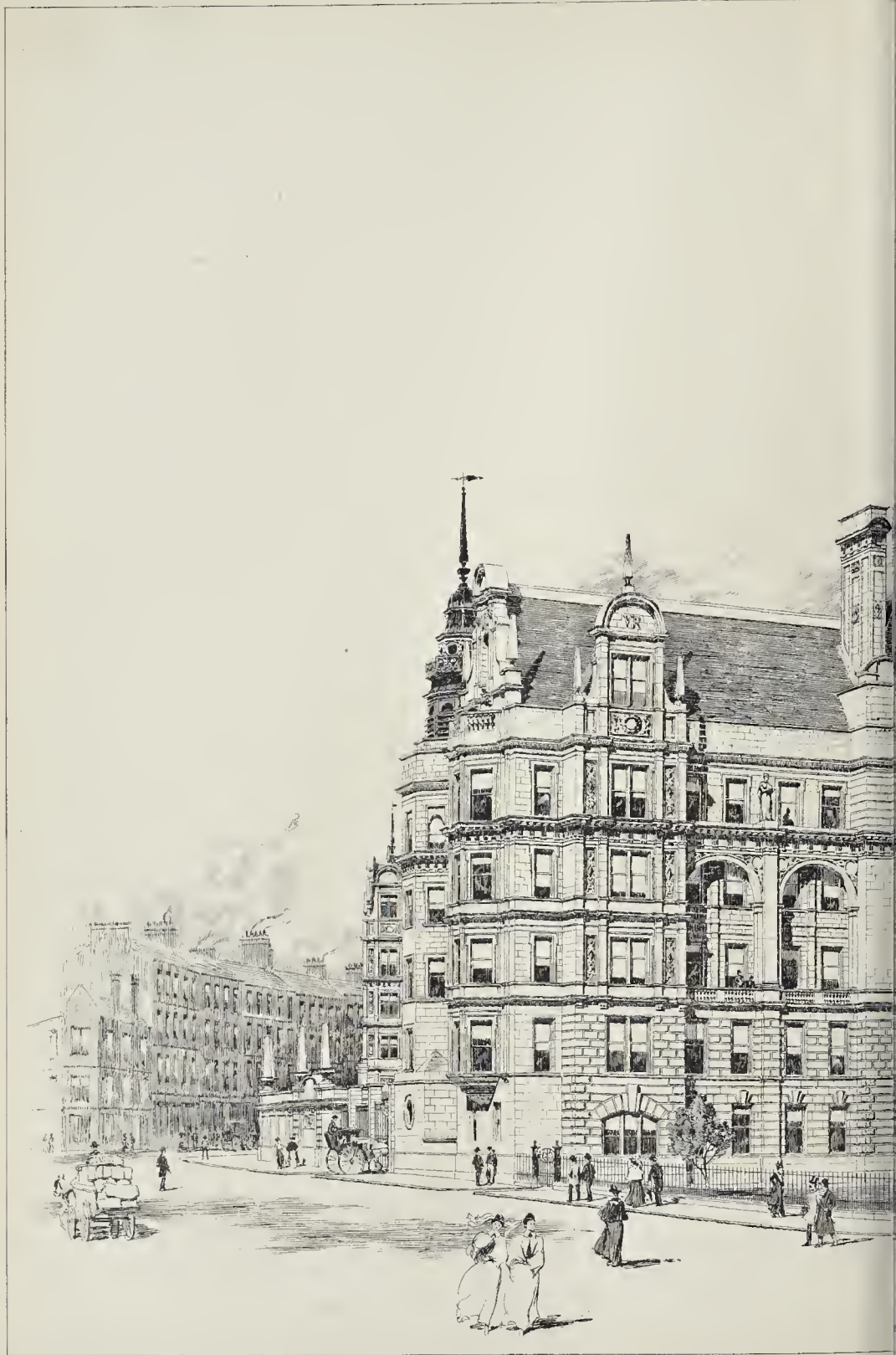
SATURDAY, MARCH 23.

Institute of Sanitary Engineers (Incorporated).—Examination in Practical Sanitary Science. Royal Institution.—Right Hon. Lord Rayleigh, M.P., on "Sound and Vibration," 3 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Sewage Works, Sutton, 3 p.m. Edinburgh Architectural Association.—Visit to the Victoria Cabinet Works, Kirkcaldy. Dundee Institute of Architecture.—Visit to Baldov Asylum.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT. February 27.—By WYATT & SON (at Chichester). Chichester, Sussex.—21 and 22, Whyke-lane, 1, r. 28s. 17 and 18, St. James's-st., 1, r. 28s. 11, 12, and 42, Florence-bldg. (at Camden Town). By BALCH & BALCH. Holloway.—7, 20, 29, 30, 33, 37, 39, and 45, g.r. 24, 10s. 7 1/2, g.r. 504, 8s. r. 288f. (in lots) 21 36, 37, 38, and 41, Poyning's-rd., ut. 70 yrs, g.r. 21, 10s. r. 138f. Kenish Town.—21, Allcroft-rd., ut. 62 yrs, g.r. 74, r. 32f. February 28.—By BROWETT & TAYLOR. Hackney.—62 and 64, Amburst-rd., ut. 49 1/2 yrs, g.r. 12s. r. 90f. Croydon.—Queen-rd., The Princess Arms p-h, l.g.r. 18f, reversion in 62 yrs. Caledonian-rd.—Copenhagen-st., The Golden Lion p-h, l.g.r. 24, reversion in 41 yrs. Teddington.—Stables-rd., Homeville, l.g.r. 67 yrs, g.r. 3l. r. 30f. By CHESTERTON & SONS. Wapping.—High-st., Hastie's Wharf, l. r. 250f. By FARBROTHER, ELLIS, & CO. Bloomsbury.—30 and 31, Gloucester-st., r. 125f. 3. Old Buckenham Norfolk.—High-rd., two freehold cottages. By LINNETT & LANE. Kentish Town.—42, Falklands-rd., ut. 62 yrs, g.r. 8l. r. 45f.





COMPETITION DESIGN FOR GLASGOW ROYAL EXCHANGE



BY THE ARCHITECTS

PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

MARY.—By MESSRS. MALCOLM STARK & ROWNTREE.



CONTRACTS AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Surveyor's Materials	Downham Market (Norfolk) R.D.C.	H. Wayman, Union Offices, Downham Market	Mar. 19
Road Materials, &c.	Middlesbrough R.D.C.	W. H. Dixon, Surveyor, Kirby-in-Cleveland	do.
House, Baildon, Yorks	Bradford School Board	R. Calvert, Architect, 4, Forster-square, Bradford	do.
Alterations, &c., to Schools, Thornton		T. Garbutt, School Board Offices, Manor-row, Bradford	do.
Additions to Church and Schools, Aberystwyth	Lancs County Council	Habershon & Co., Architects, 41, High-street, Newport	do.
Police Station, Inglewhite, near Preston	Walsall Corporation	H. Littler, Architect, County Offices, Preston	do.
Road Works, Sutton Crescent, &c.		Borough Surveyor, Town Hall, Walsall	do.
Four Houses and Shop, Highgate Heaton, Yorks	Bury (Lancs) Corporation	Rycoff & Peth, Architects, Manchester-road, Bradford	do.
Cement, Kerbs, &c.	Mr. A. Beaumont	Bury, Bradley, Civil Engineer, Town Hall, Bury	do.
Three Houses, Overcarr-lane, Royston		H. Crawshaw, Architect, 13, Regent-street, Barnsley	do.
Alterations to Steading, Alford, N.B.	Pontypool U.D.C.	Cochran & Macpherson, 152, Union-street, Aberdeen	do.
Rebuilding Farmhouse, Aldeburgh, Essex	Stokesley R.D.C.	J. W. Stark, Architect, Colchester	do.
Widening Bridge, Afon Llwyd		D. J. Lougher, Engineer, Bank Chambers, Pontypool	Mar. 20
Road Metal, &c.	Colne (Lancs) Corporation	W. H. Dixon, Surveyor, Kirby-in-Cleveland	do.
House, Mold Green		J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Footbridge, &c., Phillips-lane	Bredbury & Romley U.D.C.	W. H. Hartley, Borough Surveyor, Town Hall, Colne	do.
Electric Lighting Station	Rhondda U.D.C.	do.	do.
Kerbs, &c.	Alcester R.D.C.	Surveyor, School Brow, Bredbury	do.
Wrought-iron Tubes, &c.	Stockport Corporation	O. Thomas, Engineer, Pentre, Glam	do.
Street Works, Kirkstall, Leeds		A. E. Dixon, Architect, 5, Park-lane, Leeds	do.
Bridge Works, Little Alne	Aylesbury U.D.C.	C. Gander, Surveyor, Council Offices, Alcester	do.
Iron, Mytholmroyal, Yorks	Ilkington Gnarlians	L. Atkinson, Civil Engineer, St. Petersburg, Stockport	do.
Surveyor's Materials	Burley Corporation	L. Coates, Architect, Yorks Bank Chambers, Halifax	do.
Drainage Work	Salford Corporation	J. H. Bradford, Surveyor, Town Hall, Aylesbury	Mar. 21
Surveyor's Materials	Cardiff Corporation	W. Smith, Architect, 35, Chancery-lane, W.C.	do.
Lime (1,150 tons)		Borough Surveyor, Town Hall, Burley	do.
Road Works, Watson-lane, Sowerby Bridge		Gas Engineer, Bloom-street, Salford	do.
Offices, The Hayes		W. C. Clements, Architect, 25, Southgate, Halifax	do.
Chimney shaft, Roath		W. Harpur, Civil Engineer, Town Hall	do.
Hospital, Fort William, N.B.	Nelson (Lancs) Corporation	do.	do.
Cast-iron Pipes, &c.	Mr. C. W. Baxter	L. & J. Falconer, Architects, Fort William	do.
Additions to Ollas House, Sedburgh	Manchester Corporation	A. Allan, Engineer, Town Hall, Nelson	do.
House, New Close, Shipley, Yorks	Park Building Club	S. Shaw, Architect, Highgate, Kendal	do.
Gas Works, Shed, &c., Bradford-road	Newtownards (Ireland) U.D.C.	M. O. Newbigging, Civil Engineer, Town Hall, Manchester	do.
Thirty-six Houses, Mountain Ash, Glam	Driffield (Yorks) R.D.C.	Jorgan & Elford, Architects, 1, Jeffrey-street, Mountain Ash	Mar. 22
Retort House, &c.	Buxton Gas Committee	W. Heron, Council Offices, Newtownards	Mar. 23
Oranite Setts (2,500 tons)	Clitheroe (Lancs) R.D.C.	F. Stubbs, Civil Engineer, Municipal Offices, Blackburn	do.
Whinstone (6,000 tons)	Swindon Corporation	T. C. Beaumont, Surveyor, Driffield	do.
Steel Gasholder Tank, &c.	Waterloo (Lancs) U.D.C.	H. Barker, Engineer, Town Hall, Buxton	do.
Water Supply Works	East Riding County Council	J. Eastham, Church-street, Clitheroe	do.
Surveyor's Materials	Buxton Town Council	A. H. Hamp, Borough Surveyor, Town Hall, Waterloo	do.
Pipes, Cement, &c.		H. Beaumont, Civil Engineer, Beverley	do.
Whinstone (6,000 tons), Beverley		H. Barker, Engineer, Town Hall, Buxton	do.
Gasholder Tank, &c.	Houslow U.D.C.	S. Hill, Architect, Oreen-lane, Redruth	do.
Schools, Probus, Cornwall	Great Harwood (Lancs) U.D.C.	O. Gunnison, Borough Surveyor, Blairgowrie	do.
Road Works, Blairgowrie, N.B.	Hornsey U.D.C.	P. G. Parkman, Surveyor, Town Hall, Houslow	do.
Stoneware Pipes, Granite Setts, &c.	Hensworth R.D.C.	R. Chippendale, Town Hall, Great Harwood	do.
Paving Works	Bacup (Lancs) Corporation	Engineer, Council Offices, Southwood-lane, Highgate	Mar. 25
Chimney Shaft	Newport (Mon.) Corporation	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Additions to Workhouse, Beckett-street	Eiland U.D.C.	T. H. Richardson, Surveyor, Hensworth	do.
Surveyor's Materials		Borough Surveyor, Town Hall, Bacup	do.
Constructional Steel Work	Gateshead Corporation	H. P. Parrhall, Engineer, 3, Princes-street, E.C.	do.
Foundations, &c.	Beckenham U.D.C.	R. H. Hayes, Borough Engineer, Newport	do.
Baths, &c.	Essex County Council	O. Hepworth, Architect, 20, Bradford-street, Brighouse	do.
Paving Works, Saddleworth-road	Croydon Borough Council	P. H. Whitman, Council Offices, Eiland	do.
Road Materials	Willesden District Council	J. Hower, Civil Engineer, Town Hall, Oatchead	do.
Roads	Wemley U.D.C.	Surveyor, Council Offices, Beckenham	do.
Wood Paving	West Ham Borough Council	County Offices, Chelmsford	do.
Fencing and Gates	Hornsey U.D.C.	Borough Engineer, Town Hall, Croydon	Mar. 26
Coal and Coke	Uppigham R.D.C.	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
*Materials	Mr. J. A. Booth	Surveyor, Public Offices, West Ham, E.C.	do.
*Steam Road Roller	Shoburness U.D.C.	Borough Engineer, Town Hall, West Ham, E.C.	do.
*Sewering, Levelling, &c.	Wilton (Wilts) Town Council	Engineer, Council Offices, Southwood-lane, Highgate, N.	do.
Granite Road Metal (4,000 tons)	L. & Y. Railway Company	J. E. Willford, Council Offices, Uppigham	do.
Houses, Church Hill, Thorner, Leeds	Kettering U.D.C.	H. Walker, Architect, 3, Upper Fountain-street, Leeds	do.
Storage Tanks	Isle of Thanet Guardians	H. Harris, Surveyor, Clarence-street, Southend	do.
Cottage, Ditchampton	Hull Corporation	H. J. King, Russell-street, Wilton	do.
Warehouse and Yard Works, near Blackburn	Penryn Harbour Commissioners	R. C. Irwin, Hunt's Bank, Manchester	do.
Refuse Destructor	Epsom U.D.C.	T. Reader Smith, Surveyor, Market Place, Kettering	do.
*Drainage, &c., Works	Newport (Salop) U.D.C.	L. Grant, Architect, St. Ingbourne	Mar. 27
*Nurses' Home	The Prison Board	J. H. May, 249, High Holborn, W.C.	Mar. 29
*Destructor Buildings	Mr. G. Beestall	City Engineer, Town Hall, Hull	do.
*Harbour Works	Mr. R. Burlington	J. P. Jenkins, Civil Engineer, Town Hall, Penryn	do.
Cement, Oranite, Flints, &c.	Congleton R.D.C.	Surveyor, Bramley Hurst, Epsom	Mar. 30
Timber, Stoneware Pipes, &c.		H. W. Spowart, Town Hall, Llanelli	do.
Works and Materials		See Advertisement	April 1
*Building Materials and Tools		See Advertisement	April 2
Two Cottages, St. Mellons		P. B. Boulton, Architect, Furnival-chambers, Chesterfield	No date
Alterations to Business Premises, Somercoates		J. S. Moffat, Architect, 53, Church-street, Whitehaven	do.
Rebuilding 19, Church-street, Whitehaven		J. Robinson, Surveyor, Wincwell	do.
Three Houses, Hough-lane, Womwell		W. Wyatt, Engineer, 99, Radford-road, Leamington	do.
Sewers, &c., Elworth, near Sandbach			do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicat to be fi
*Clerk of Works	Scarborough Corporation	£l. 3s. per week	Mar. 2
*Clerk of Works	Camberwell Guardians	4l. 14s. 6d. per week	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xix. & xxi.

PRICES CURRENT (Continued).

Table of metal prices including Iron, Steel, and Sheet Iron. Columns include item name, weight, and price per ton in London.

ENGLISH SHEET GLASS IN CRATES.

Table of glass prices in crates, listing various sizes and prices per delivered unit.

OILS, &c.

Table of oil prices, including Lined Oil in pipes and drums, and other petroleum products.

VARNISHES, &c.

Table of varnish prices, listing different types of copal and carriage varnishes.

TO CORRESPONDENTS.

Notice to correspondents regarding article submissions, including instructions on signatures and return addresses.

TENDERS.

General notice regarding tender procedures, including instructions on how to address tenders and the use of 'denotes accepted' and 'denotes provisionally accepted'.

BROMLEY (Kent).—For additions and alterations to private residence at Sundridge Park. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C.2.

CANTERBURY.—For the extension of the electricity works for the Corporation. Quantities by City Surveyor, Canterbury.

DARWEN (Lancs).—For alterations to store premises, Spring Bank, for the Industrial Co-operative Society, Limited.

DOWNE (Kent).—For the erection of a detached private residence. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C.2, and Orpington.

HARROGATE.—For the various works required in the extension of boiler house at the electric lighting station, Harrogate. Mr. F. Bagshaw, Borough Engineer.

HARROGATE.—For draining, levelling, pitching, ballasting, kerling, and channelling the new road across Harlow Moor for the Corporation.

HARROGATE.—For emptying ashpits and dustbins from February 24 to September 24, 1901. Mr. F. Bagshaw, Borough Engineer, Harrogate.

HULL.—For the erection of schools, Thoresby-street, for the School Board. Messrs. Brodric, Lowther, & Walker, architects, Lowgate, Hull.

IPSWICH.—For the erection of offices, Museum-street, for Messrs. Jos. Bird & Son. Mr. G. W. Leighton, architect, 6, Princes-street, Ipswich.

KING'S LYNN.—For work at Rackham's Almshouses, King's Lynn, Norfolk. Mr. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich.

LERWICK.—For the erection of school buildings, for the School Board. Mr. John Morgan Aitken, architect, quantities by architect.

SALISBURY.—For the erection of a Masonic Hall, Canal-street. Mr. A. C. Bothams, architect, 34, Chippenwell, Salisbury.

LEEDS.—For the extension of the Crown Works, Harthills-road, for Mr. A. W. Midgley. Mr. A. E. Dixon, architect, 5, Park-lane, Leeds.

LINGFIELD (Surrey).—For erecting banking premises and residence for Mr. D. W. Farrance. Mr. W. C. P. Gillam, architect, Brighton.

NEWPORT.—For concrete and brickwork covered service reservoir, for the Newport (Isle of Wight) Corporation. Mr. Edw. T. Hildred, engineer, 1, High-street, Gosport.

ORPINGTON (Kent).—For the erection of small villas at Cbapel-street. Mr. St. Pierre Harris, architect, Orpington, and 8, Ironmonger-lane, E.C.2.

OSWESTRY.—For the erection and completion of fire station, stores, stables, cart-shed, and mortuary, for the Engineer and Surveyor. Quantities by the Borough Surveyor.

REDHILL.—For new conservatory, &c., at Holt House, Redhill, for Mr. T. V. Low. Mr. C. E. Salmon, architect, Bell-street, Reigate.

ST. MARY CRAY (Kent).—For the erection of stabling at new residence in High-street. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C.2, and Orpington.

SCARBOROUGH.—For the erection of offices, Deans-street, for the Guardians. Messrs. Runtun & Barry, architects, Huntriss Chambers, Scarborough.

WEST WINCH.—For work at Church of St. Mary, West Winch, Norfolk, near King's Lynn. Mr. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich.

WORKINGTON.—For alterations and extensions to Mr. J. T. Lister's furniture warehouse and showrooms, Finkle-street, Workington, for Mr. John Jessop.

LONDON SCHOOL BOARD TENDERS. At the last meeting of the London School Board, the Works Committee submitted the following list of tenders.

Table of London School Board tenders, listing various contractors and their prices for different works.

[See also next page.]

BONNER-STREET.—Cleaning interior (boys and girls):—
 Gibb & Co. £135 0 0 Barrett & Power £108 0 0
 Silk & Son 120 0 0 Collis Willmott* 104 5 0
 W. Shurmur 118 0 0

CONWAY ROAD.—Painting interior and exterior:—
 W. Jolly £610 15 Hayter & Son £377 10
 W. Banks 456 10 H. Groves 355 0
 J. Kybett 415 0 E. Proctor* 350 0
 Johnson & Co. 390 0

DULWICH HAMLET.—Painting interior:—
 H. Lenny £369 Maxwell Bros., Ltd. £204
 J. & C. Bowyer 252 Rice & Son* 199
 H. Line 215

EDWARD-STREET (Temporary).—Painting interior:—
 W. Banks £325 0 E. Proctor* £103 0
 W. J. Howie 253 0 S. Musgrove* 85 10
 H. Groves 145 0
 Hayter & Son 115 0
 Blackheath Sanitary and Decorative Works 105 0

EVERINGTON-STREET.—Painting interior:—
 E. Flood £488 0 C. Gurling £432 0 0
 S. Polden 351 0 W. Hornett 315 0 0
 W. R. & A. F. Chidley 303 17 6
 Hide 346 10 W. Hammond 257 9 8
 P. T. Chichea 344 10 C. Curd* 185 0 0
 W. Chappell 340 0

FARNCOMBE-STREET.—Painting interior:—
 W. Banks £512 0 G. Barker £370 10
 Johnson & Co. 476 0 E. Triggs* 348 0
 H. J. Williams 438 0

GIDEON ROAD.—Painting interior and exterior:—
 R. S. Ronald £526 4 6 Lathey Bros. £437 0 0
 Lorden & Son 468 0 Maxwell Bros., Ltd. 428 0 0
 Johnson & Co. 438 0 E. B. Tucker 427 10 0
 Holliday & Greenwood 437 0 E. Triggs* 350 0 0

GLOUCESTER-GROVE EAST.—Painting interior:—
 King & Son £352 0 W. Hammond £224 14
 S. Polden 325 0 W. Hornett 201 0
 E. Flood 285 0 W. Brown* 190 0
 F. Chidley 227 9

HAGUE-STREET.—Painting interior:—
 J. F. Holliday £401 0 J. Haydon £332 10 0
 J. Kybett 386 15 W. Shurmur 315 0 0
 Collis Willmott 366 15 G. Barker 285 0 0
 Barrett & Power 355 0 S. H. Corfield* 269 0 0
 Silk & Son 350 0 0

HAMOND-SQUARE.—Painting interior and exterior:—
 Bate Bros. £1,175 Silk & Son £590
 Barrett & Power 718 G. Wales 590
 W. Shurmur 640 G. Barker 587
 Marchant & Hirst 620 Stevens Bros. 586

HOLLAND-STREET.—Painting interior:—
 R. S. Ronald £402 Johnson & Co. £283
 Holliday & Greenwood 307 Lathey Bros. 281
 Garrett & Son 298 Maxwell Bros., Ltd. 223
 G. Britain* 224

C. B. N. SNEWIN

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LOWER CHAPMAN-STREET.—Painting interior:—
 A. E. Symes £552 0 0 J. T. Robey £394 10 0
 Wall & Co. 441 0 S. H. Corfield 384 0 0
 A. W. Darby 412 10 0 G. Wales 359 10 0
 J. F. Holliday 409 10 0 J. Haydon 358 18 0
 Gibb & Co. 407 0 0

MANTUA-STREET.—Cleaning interior:—
 W. Hammond £367 0 E. B. Tucker £366 19
 R. S. Ronald 353 0 Lathey Bros. 293 0
 Holloway Bros. 345 0 E. Triggs* 284 0

POOLE'S PARK.—Cleaning interior:—
 Bate Bros. £525 Grover & Son £337
 Barrett & Power 255 Stevens Bros. 236
 G. Kirby 252 Marchant & Hirst 217

RATHFERN ROAD.—Painting interior:—
 Hayter & Son £300 0 W. Banks £236 10
 J. & C. Bowyer 295 0 C. G. Jones 229 11
 G. Kemp 270 0 H. Groves* 206 0

RISINGHILL-STREET.—Painting interior and exterior; old and new portions:—
 Bate Bros. £1,020 0 Marchant & Hirst £679 0
 T. Crawley 760 0 M. Pearson 490 0
 McCormick & Sons 747 0 Bristow & Eatwell 457 7
 Wall & Co. 711 0

RUBY-STREET.—Cleaning interior:—
 Johnson & Co. £225 Rice & Son £147
 W. J. Howie 192 H. Line 140
 G. Kemp 145 W. V. Goad* 140

WALNUT TREE-WALK.—Painting interior:—
 J. F. Ford £486 0 Rice & Son £395 0 0
 Bulled & Co. 436 0 King & Son 338 0 0
 Martin, Wells, & Co. 420 0 G. Britain 324 0 0
 H. & G. Mallett 397 10 W. Smith* 313 12 4

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ILLUSTRATIONS.

Principal Entrance to New Scotland Yard.—Drawn and measured by Mr. Harry Jones	Double-Page Tone Block.
Some Recent Designs for Pianofortes:—	
Concert Grand.—Designed by Mr. Arthur C. Blomfield	Single-Page Tone Block.
Upright Grand.—Designed by Mr. G. Ogilvey	Single-Page Tone Block.
Drawing-room Grand.—Designed by Mr. E. L. Lutyens	Single-Page Tone Block.
Semi-Grand.—Designed by Mr. Chas. C. Allom	Single-Page Tone Block.
Municipal Buildings, Public Hall, and Free Library, Plumstead.—Messrs. S. B. Russell and C. E. Malloes & Grocock, Joint Architects.....	Double-Page Photo-Litho.

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Some Cities of Modern Italy—Mantua.



O pass direct from Milan to Mantua, although the two cities are within the same province and have many characteristics in common, is like entering an abandoned church from the noisy modern street. Mantua is one of the old Italian cities least touched by the changed spirit of modern times. It jealously preserves the traditions of its historic past—its Lombard arcaded streets, its huge rambling palaces abandoned to emptiness and a few squatting villas, whose presence can only be accounted for by the evident neglect to which these buildings have been subject since the days of the Austrians. The disused private palaces of the city, with their grass-grown courts, decaying woodwork, and rusty iron gates, give it a very forlorn appearance. The enormous fortifications of the Napoleonic era, long since out of date, are entered by drawbridges, whose chains and machinery have apparently been appropriated for the sake of the old iron. Seldom visited by the tourist, the architectural treasures of the city are but little known, although the extraordinary creations attributed to Giulio Romano (a sort of creature copyist of Michelangelo) have a certain celebrity, very few people nowadays think them worth the trouble of a visit. Mantua, although it possesses no modern buildings, has a certain title to notice in a series of sketches of modern Italy, on account of the work being carried out in its name by the "Ufficio Regionale." This is the most estimable of modern institutions in Italy, planted, about two years ago, one of its divisional offices in the old palace of the Gonzaga, under the direction of Signor Arch. Signor Patricolo. Signor Patricolo has already done a great deal, but his labours only show what an enormous amount of

artistic work still remains buried under the successive layers of plaster and colour-wash which encrust the palace in every direction. It is truly a case of exploration more than restoration (the latter hated word is not permitted within the formulas of the U. R.). Operations were commenced in 1898 by scraping off the plaster fronts of the palace, with the greatest care, and as Signor Patricolo expresses it, "a page of history appears." The lower portions of the palace, with its arcades and the balconied windows shown in a very old picture preserved in Milan, have now come to light, and represent the thirteenth century; the upper portions of the palace are the Gonzaga additions of the fourteenth century. All these fronts will now be carefully preserved as they stand, without any "restoration," but with only such small repairs as may be absolutely necessary to ensure their stability. A very interesting discovery recently made inside the palace consists of a suite of rooms, a small building at one time almost detached, built for the celebrated Isabella d'Este about 1490. This apartment had actually been lost sight of, and was merely known from records as the "camera picta." Now, in the course of investigation, the whole suite of rooms has emerged from a collection of outbuildings of recent times in which it had become buried. It consists of a small court surrounded by a colonnade of delicate Ionic marble architecture, with a series of rooms radiating out of it, most of which are decorated in a very curious manner with a mosaic of crystals and coloured marbles on the walls. From these decorations the apartment has taken the name of "la grotta." All the marble work and decorations had been smothered up so completely with plaster, and alterations by partitions, &c., during the last two or three centuries, that their discovery excited a very considerable amount of surprise. The badges and monograms of Isabella are preserved amongst some of the fresco decorations.

Another very important work connected with this palace is at present being carried

out by the department—the isolation of the very beautiful fourteenth century Castle of St. George, situated at the eastern extremity of the buildings and of the city. Considering the extremely flat nature of the site of Mantua and its surroundings, this castle presents a wonderfully imposing appearance. Situated on the line of earthwork fortifications (there are no mediæval city walls), it is approached by a very long bridge spanning one of the curious lakes, or rather swamps, which surround the city. The castle would appear to have been built as the stronghold of the mediæval palace, and between the two were originally gardens, which have been built over to a great extent in later times. These later buildings, of a poor, sordid description, have covered up until recently the fine old red brick mediæval towers, the tops of which, with deep machicolations and embrasures, were only just visible. During the last few months the castle has been almost entirely freed from these unsightly additions, and now stands in a most singular state of preservation, surrounded by the ancient moat; but its walls are, of course, much seamed and marked with the traces of the buildings which have been removed. The castle, consisting of a square mass, with four square angle towers and a projecting gateway, all in red brick, with tile roofs over every part, will be left exactly as it stands, untouched but for certain repairs to windows and doors necessary to render it habitable and usable as the provincial "Archivio," for which purpose it is admirably adapted. Nothing in the shape of so-called "restoration" will be attempted, and so another monument will be added to that interesting series which is being cared for under the auspices of the newly-instituted "Ufficio Regionale per la Conservazione dei Monumenti in Lombardia."

Before very long Mantua will become an interesting and attractive city, with its recovered palace and its imposing castle. The sentiment which is guiding this recovery is an entirely modern one, and would have been unintelligible to the "restorers" of forty years ago. The city has, fortunately,

been preserved for better times, and its exceedingly interesting buildings are now in good hands. The dirt and sordid squalor of the immediate past is being removed, whilst at the same time everything of the slightest historical or artistic interest is now carefully left exactly as and where it is found, and however broken or defaced such things may be, they are preserved without any question of "restoration."

THE DECORATIVE TREATMENT OF THE PIANOFORTE.



WE publish this week four illustrations of decoratively treated pianofortes, all made by Messrs. Broadwood (to whom we are indebted for the loan of the photographs from which the illustrations are taken), but designed by various architects or decorative artists whose names are appended to the illustrations.

We do not consider that any apology can be considered necessary for introducing such designs among the illustrations to an architectural journal. The designing of furniture is in its nature closely connected with architectural design; and a pianoforte is one of the largest and most important pieces of furniture to be found in a modern house. Moreover, the use and object of the instrument give it a suggestiveness beyond that which belongs to most articles of furniture. It is the medium for giving voice to the productions of another art, and that one of the most poetic and certainly the most abstract of all the arts. It should surely claim a treatment worthy of so high a function.

Unfortunately, till very recently, the make of the outward and visible form of the piano has been entirely in the hands of the average cabinet-maker, who has had no object in view but solidity and a certain costliness and finish of mere material and surface. The operative portion of a grand piano represents a considerable weight, which seems to require strong supports, and this need has been supposed to be sufficiently met by the adoption of those thick elephantine legs, of a design suggesting the old forms of cheap decanter-stopper, with which we are only too familiar. It is, moreover, a costly instrument, and may therefore fittingly be enclosed in costly wood; but costliness has in general been the object rather than design, and polished walnut or polished ebony have been supposed to provide, in their own intrinsic appearance, all that the purchaser could desire, without the attempt to intrude any special design into the case. And it must be remembered that the majority of persons who go to choose a piano go to choose it as a musical instrument, and (not unnaturally) think more of the tone than of any other quality of its make.

The piano, like the organ, is in a different category in regard to form from most musical instruments. In the whole of the violin tribe of instruments, as well as in all the wind instruments played by the lips, the form of the instrument is that which is necessary for the production of its special sound. There is considerable beauty in a violin; but, except in regard to the scroll head, the beauty arises entirely from the fine character of the curvatures and lines which its shape naturally

takes; the peculiar shape being a necessary condition for the production of the tone required. In the piano the actual sound-producing parts are not visible, but are encased, for the same reason that a violin is put away into a case when not in use—for necessary protection from dust and atmospheric influence; only, as the mechanical portion of the piano is too heavy and too complicated to be moved about or put in and out of a case, its case has to be a permanent one. Under these conditions it can, of course, as the members of the Architectural Association were informed the other day by Messrs. Broadwood, be made in any outward shape we please. But in dealing with a grand piano, where the stringing and the frame naturally assume a harp-like form, it seems in accordance with the fitness of things that the case should follow that form. A rectangular shape would mean a considerable waste of space, and would moreover deprive the exterior outline of its special and peculiar character. The grand piano outline may be an awkward one to place in a room, and an awkward one to treat as a piece of furniture; but that is the outline arising out of the construction of the interior, and it is desirable to retain it.

Admitting that the general structural form of the grand pianoforte should be retained, the decoration should obviously be subordinated to this form, and should be designed so as to follow the lines and spaces of the structure, and give solidity to the supports while giving them some better decorative treatment than that of the common form of "decanter-stopper" legs to which we have referred. The painting of elaborate pictorial subjects on the outside and inside of the top, which has been carried out in some cases, is really not so much decorating a piano as making it a panel to paint pictures on; the purpose of the instrument is apt to be lost under the application of this kind of pictorial decoration; the piano becomes in fact quite subordinate to the decoration, and we are inclined to think that this kind of pictorial decoration is generally preferred (where it is preferred) by those who attach very little importance to the musical functions of the instrument; they want an ornamental piece of furniture, not a piano. And in no case should the keys be the subject of any decoration whatever. They are for use, not show, and the clearly marked contrast of the ordinary black and white keys is a necessity to the pianist who (if he is a master of his craft) does not look much at the keyboard, but who requires from time to time just to catch sight of the group of black keys at one or other part of the keyboard as a guide in a long skip from one position to another. To reverse the order of treatment and make the usually white keys dark and the "semitones" light in colour, merely because many old instruments were made in that way, is absurd; it is putting decorative treatment before practical use, and making a gratuitous puzzle for the eye of the player. Any kind of inlay ornament on the keys is also entirely out of place; in process of time it wears irregularly and spoils the surface, at the same time confusing the eye of the player. The surface of the keys, for use, cannot be too smooth and unbroken.

In the pianos we illustrate the keyboard of only one is shown, which has the

ordinary black and white keys, and we hope all the others are the same; indeed, we presume that Messrs. Broadwood understand their business as pianoforte makers too well to consent to any but the normal treatment of the keyboard. Mr. A. C. Blomfield's design No. 1, is in nearly every respect excellent; the lines of structure are all followed in decoration, and the supports are treated in an architectural manner which is graceful and appropriate while having every appearance of firmness and stability. The only point we take exception to is that in carrying out this architectural treatment in perhaps a slightly too conventional manner, the break of the "cornice" worked on the edge of the lid, so that when the lid is lifted, as shown in the illustration, the cornice is divorced from the entablature, and moreover shows in shape of projections on the edge of the lid, which, in that position, have no meaning and look decidedly out of place. This detail might have been avoided by a little modification in the treatment of the design. We do not know where the line comes from which is inlaid on the under side of the lid:—

"Soft is the music that would charm for ever, but it seems a very weak quotation to put on a musical instrument, and is particularly out of place in that position, seeing that the lid is only raised in order to increase the power of the sounds. Is it intended as a hint to the player to put the lid down again?"

The upright grand, No. 2, designed by Mr. Gilbert Ogilvy, is very pleasing in decorative treatment, but it is a form of case for the instrument which appears to us to have no advantage whatever, unless the object is to make something which, when closed, will look as little like a piano as possible. The flap doors standing open on each side are merely a nuisance to the player, suggesting a feeling of not having elbow room, and we do not see that a form of piano has anything whatever to recommend it either in an æsthetic or practical sense.

The piano No. 3, designed by Mr. Lutyens, has the merit of simplicity and absence of pretence in the decorative treatment, but the design of the supports suggests that, had it first made them too thin for stability, the architect felt under the necessity of bracing them together to ensure a firmness which their unaided proportions would not supply. We do not think the result is happy, though there is no doubt a novelty and grace in the treatment of the curved braces.

The semi-grand No. 4, by Mr. Allcock, decorated with simple and graceful inlay designs, is in an excellent taste; but the designer, in adopting thin legs coupled together, has rather sacrificed stability of appearance to elegance. The pianoforte, as already observed, is a heavy affair, and when it has to be moved all over the floor, which is sometimes necessary, the side strain on the legs is very considerable, and they ought to be strong enough to stand it. If that piano were moved lengthways, the end legs would be subject to more strain than they seem able to bear. Moreover, absolute stability of instrument is of the greatest importance to the player; solid-looking supports are therefore demanded both for practical and æsthetic reasons; and the movement

avour of paring down the legs of a piano to thin and what are supposed to be elegant proportions seems a mistake.

NOTES.

The Monument to Queen Victoria. THE proposal to erect the memorial to our late Queen in front of Buckingham Palace perhaps as good a one in regard to taste as could be made; but it ought to be once pointed out, in the most emphatic manner, that to render any important monument of the kind effective, the question of its position on the ground will need very careful consideration, or else some rearrangement of the ground will be necessary. At the time when the Marble Arch was first erected in front of Buckingham Palace the courtyard between it and the Palace was laid out in a decorative manner, and the then straight canal in St. James's Park ceased and was axial with the centre of the Palace. Now the straight canal has been replaced by an irregular sheet of water which is not central with anything, and the axis of the Mall is not in a line with the axis of the Palace. Unless we are to see repeated the blunder so constantly made in London, of erecting monuments, arches, and buildings of monumental character, without the slightest regard to axial position and as if they were thrown on the ground by accident, it must be obvious that if the proposed monument is to occupy a position axial with the line of the Mall, it must be kept entirely disconnected from the Palace, otherwise its position will appear absurd; if it is to be central with the Palace, it must be kept as close as possible to the latter, and entirely disconnected from the Mall. Considering the wretched architectural character of the front of Buckingham Palace, it may be suggested that one part of the scheme might very well be, to erect a new façade to Buckingham Palace itself—a façade worthy of the position and its associations, and which would form a portion of the memorial, the special monument to the Queen standing closely in front of and even connected architecturally with the new façade. Otherwise, any architectural and sculptural monument erected immediately in front of the Palace would only intensify the mean and commonplace character of the Palace façade.

Frescoes of S. Maria Antiqua. FEAR has been expressed that the remarkable frescoes of the seventh and eighth centuries which adorn this recently-discovered church in the Roman Forum must suffer severely from exposure to the air and lose much of their extraordinary freshness. We are in a position to state that every precaution is being taken for their due preservation. Not only is a skilled artist at work making coloured facsimiles—a Herculean task considering the extent of the frescoes—but under the direction of Signor Boni, a process of *sterilizing* the plaster is being carried out and effectively prevents any further fading. Every one interested, not only in mediæval antiquities but more especially in the influence of classical tradition on Christian art, should study these remarkable frescoes. The earlier ones are distinctly Pompeian in manner, and the transition to a rigid Byzantine style can clearly be seen. It is, indeed, a marvellous piece of good fortune

that has preserved for us with such wonderful freshness a fresco such as that of the Crucifixion, securely dated by the inscribed figure of Paul I. (A.D. 757-767) marked as contemporary art by the *square nimbus*.

The Workmen's Compensation Act. THE broadening effect of the recent decision of the House of Lords on the Workmen's Compensation Act is very well instanced by the case of *Dredge v. Conway, Jones, & Co.*, which was decided last week by the Court of Appeal. The man who was injured was whitewashing and stopping the ceiling of a staircase, and he was standing on a mixed erection made of planks resting on ladders—one of those makeshift affairs with which every householder who has had the interior of his house whitewashed is familiar. The County Court Judge decided that the house was not being constructed or repaired by means of a scaffolding within the meaning of the Act. This decision has now been overruled by the Court of Appeal, on the authority of the House of Lords, in *Hoddinot v. Newton*. In other words, as we stated at the time of the last decision, the judges must now construe the Act from the point of view of including as far as possible all building or similar operations within it. Why in the first instance the Act could not have been drafted so as to secure this result without the expenditure of so much money in litigation it is difficult to imagine. Even yet, with the most liberal construction, it is possible for some workmen to be excluded from its benefits, and we feel certain that it would be most desirable that Parliament should amend it by striking out all its limitations, more especially that in regard to the limit of 30 ft. in the height of buildings. Nearly all workmen are now affected by it, and it is better that there should not be even a limited exclusion.

Polyphase Machinery. At the Institution of Electrical Engineers last week, Mr. Eborall's paper on "Polyphase Substation Machinery" attracted a very crowded audience. As all electricians at the present time are very anxious to become acquainted with the theory and practice of polyphase working, which has become the standard system on the Continent and in America, this partly accounts for the large attendance. Mr. Eborall's paper was a very meritorious one, and, although nothing very novel was described, it ought to prove useful to engineers, as he discusses very carefully the practical difficulties in the way of successful working. We pointed out last year that in his paper on induction motors he had left out of account the shape of the pressure wave. In this paper it is mentioned more than once, and he also deserves credit for having avoided the fallacy of a power factor of unity. He mentions that at Prague, a town of 250,000 inhabitants, there is a very successful municipal electric station providing current for lighting, power, and traction. The lighting and power supply is done by polyphase currents, whilst the electric trams get their direct current from substations operated by the polyphase currents from the central station. As the pressure on the lighting circuits is kept almost absolutely constant notwithstanding the variable loads on the traction circuit, this is a conclusive proof of

the possibility of such a combined station. The economies that can be effected by having only one central station will be obvious to engineers, and the municipal undertaking at Prague is an assured financial success. Mr. Field, one of the engineers of the tramways system of the Glasgow Corporation, who has, therefore, practical experience of the working of polyphase currents and rotary converters, described several devices he has adopted for ensuring steady working. Dr. Silvanus Thompson stated that in his opinion rotary converters, &c., were only makeshifts; the true system was to use three-phase currents throughout—to use, for example, three-phase motors on the electric-cars, and thus get rid of all the electrolytic troubles caused by leakage of the direct currents from the rails.

Society of Painter-Etchers. THE nineteenth exhibition of the Society of Painter-Etchers, now on view at the Gallery of the Society of Water-Colour Painters, shows indications of a tendency to return more generally towards the practice of pure line etching—what we call genuine etching. There is a larger proportion of this class of etching, and less of the attempts to produce special effects which do not properly belong to the etcher's art. There are none of Mr. Law's overworked productions in the style proper to engraving, nor any of Mr. Strang's essays in the grotesque; though Mr. R. Spence, in his four odd and incongruous scenes in the life of J. Fox (8 to 11) seems rather to have taken his cue from Mr. Strang. Among the most striking works in the room are, as usual, the collection of dry-point portraits of ladies by the eminent French master of the burin, M. Helleu; all of them admirable in the freedom yet certainty of line; the only drawback is the total want of expression in the countenances—whether because the sitters had none, or because the artist could not render it, we cannot determine. A fine example of free and powerful dry-point work is also M. Legros' "Solitude" (25). Many of the best examples of the art of etching are to be found not among the larger and more prominent works, but among the small plates which might be passed over by a hasty observer. Among these may be mentioned Mr. Pimlott's "Building a Boat" (6), Mr. Van Raalte's "Old Wooden Bridge, Rye" (59), one of those which shows the characteristic quality of etching in dealing with a subject in which the darks are all concentrated on the main object and the rest only indicated, the whole done with as few lines as possible; Mr. Charlton's "The Street Corner" (108), a snow scene in an old city; the same artist's "Low Tide" (123); Mr. Evershed's Italian subjects, especially "St. Peter's from the Pincio" (162) a perfect little work, executed with the greatest care and delicacy but with nothing overdone; Mr. Holmes May's "Wayside Sketch" (166); and Mr. Barrett's "Slip Top, Staithe" (177). What we call the "scratchy" style of etching is illustrated in such examples as Mr. Burridge's, 46 and 49, where the sky is all a scribble; freedom of line without a definite aim. Among architectural subjects Mr. Cameron has several from Italy which have a quality of their own; M. Kéjov's Paris sketches are rather weak; Mr. Haig's interior of Barcelona Cathedral (53) is a fine example of clean

vertical line shading; Mr. Wallace Rimington's interior of "St. Stephen's, Vienna" (207), in a different style of execution, is also very effective; Mr. Pott's view of the portico of St. Martin-in-the-Fields is out of drawing, and the columns are too thin. Among other works worth special notice are Mr. Knight's "Original Mezzotints," especially No. 206; Mr. W. Monk's "The Firs, Hampstead" (120), with the tree-trunks treated white against the background; Mr. Holroyd's "Study of Pine Trees" on Lord Tennyson's estate (72); and Mr. Bauerle's "Danaë" (41—dry-point), a very graceful half-length; his larger work, "Goblin Market" (43), is not so effective in conception as Rossetti's original illustration to the poem. A selection of "Etchings of the Norwich School," by Crome, Cotman, and Daniell, forms a feature in the exhibition; they are not mostly very remarkable works, but are interesting historically, as showing how little sense of special style in etching existed in England at that period.

THE eighty-sixth annual exhibition of the Institute of Painters in Water-Colours.

Painters in Water-Colours at their Galleries in Piccadilly, though it perhaps can hardly be said to contain any one work of the first importance, is as a whole one of the best we have seen, containing especially a considerable number of interesting studies in landscape. Of the figure subjects there are few that interest us; the best are Mr. Frank Dadd's picture of officers of the Queen Anne or early Georgian epoch choosing "Horses for the King" (229), and Mr. Collins's pre-historic "Duel" (15); and Mr. Henry Stock sends a very pretty child portrait (50) and a Titianesque study of "Pain Bringing Wings to a Soul" (279), which at least aims high, and is fine in colour. But among landscapes there is much to enjoy. The various small but rather highly finished works by Mr. Pyne are a little too finished, but all pleasing. In the first room Mr. Ferrier shows a fine view of Edinburgh Castle from the Greyfriars Churchyard (10); Mr. Weedon, who in style is almost a double of the late Mr. Wimperis, exhibits "Glen Logan, Ross-shire" (40) and several drawings in the same broad and fine water-colour style. Mr. Stratton's "A Quiet Evening" (82) is a small work of much feeling. Mr. Macbride's "On the Kennet" (94) is rather woolly in manner, but a work not to be slighted; nor, in a very different way, Mr. Rivers's "After Rain" (102), a village street scene with a touch of evening sunset light in the sky, very quiet and unpretentious, but poetic in feeling. Mr. Arthur Severn's large picture of a "Spate in the Highlands" (134), powerful in its way, is somewhat spoiled by the perspective of the bridge being unsatisfactory, the place of the piers on the water-level not coinciding with the direction shown by the line of the parapet. Among the works in the centre room is Mr. Knight's beautiful "Marshland" (277), Mr. Wetherbee's "Night" (294—the clouds are rather too solid); and Mr. Gregory's "The Brink of a Discovery" (288), a charmingly painted Thames-side scene which does not fully explain its title. In the third room are the largest and most important landscapes, among which Mr. Bernard Evans's "Storm in Wharfedale" (464) is very fine in spite of a certain yellowish conventionality

of colour. Here also are several fine landscapes by Mr. Orrock, in his well-known style; Mr. Knight's "Morning Light" (449); Mr. Davies's "Across the Ilkley Moors" (441), a very fine landscape which, without being hard or realistic in style, looks as if you could walk over it and into the distance; Mr. David Green's "A Breezy Common" (417), another inspiration from Mr. Wimperis, or appearing such; Miss Ethel Kirkpatrick's clever picture "The Lantern" (402), and several admirable little works by Mr. Nisbet, among which "November Evening" (350), is especially good—a grand landscape reduced to a small scale. Among architectural subjects Mr. Fulleylove has a carefully studied "Interior of St. Paul's" (272); Mr. Shoosmith's view of the "Place Eau de Robec, Rouen" (49), which rather reminds one of Prout; Mr. Macquoid shows us a fine view of "The Old Castle, Dieppe" (134), with the bridge across the moat leading up to it; and in "Waiting for Master" (273) Miss Violet Linton has contrived to produce quite an interesting little picture out of the brick walls of a cottage and a small white dog keeping watch in the doorway.

WE are officially informed that the King has graciously consented to continue to be the

patron of the Royal Institute of British Architects, and to offer, as was done by her late Majesty for over fifty years, an annual Royal gold medal, to be presented on the nomination of the Royal Institute to a distinguished architect or architectural writer of any nationality. For this present year, however, the gold medal remains, we believe, in abeyance.

STOCKPORT UNION INFIRMARY COMPETITION.

It is somewhat surprising that the designs submitted in this competition do not reach a higher average of merit. The conditions of the competition were fair; the premiums offered were, considering the labour involved in the preparation of the designs, more generous than in many other competitions; the name of the assessor (Mr. Thomas Worthington, F.R.I.B.A., Manchester) was mentioned in the instructions to architects; and the site was an almost exact rectangle, with the longer sides fronting north-west and south-east, and therefore lent itself to a simple and satisfactory disposition of the buildings. The requirements included an administrative block suitable for an infirmary of 500 beds, male and female ward-blocks for 300 beds or thereabouts, "lying-in" wards for about ten beds, nurses' home for thirty nurses, mortuary, porter's lodge, and receiving wards. The buildings were to be planned in such a manner that additional pavilions could be conveniently erected, so as to bring the total accommodation up to 500 beds.

The instructions make it clear that the administrative block must be practically in the centre of the site, and connected by a central corridor with the male ward-blocks on one side and the female on the other. The two double ward-blocks contemplated in the scheme to be first carried out were to be three stories high, each double block to contain on each floor two twenty-four-bed wards and two two-bed wards, together with the usual duty-rooms, conveniences, storerooms, lifts for food and beds, &c. The obvious arrangement of the ward-blocks would be to place them at right angles to the main central corridor, one-half of the double block in front of the corridor and one-half in the rear, and this arrangement has been adopted by all the competitors with one exception. The lying-in wards were to be provided "in a building attached to the females' pavilion," and this instruction has been complied with by most of the competitors, the most notable exception being the design which has gained the first premium. Another explicit instruction,

which has been disregarded by many of the competitors, is that which stated that the receiving wards and stores for patients' own clothing must be "adjacent" to the porter's lodge. Some latitude, however, was allowed to architects, permission being given to deviate from the instructions "as regards details," but the same clause contains a request that the instructions be adhered to "as far as possible."

One other requirement remains to be noticed, as it represents a departure from ordinary hospital design, and has furnished a difficult problem for the competitors to solve. This is that the bathrooms, lavatories, water-closets and sinkrooms "must be placed at the corridor end" of each large ward; the qualifying words "if possible" are added, but the competitors, with few exceptions, have accepted the instruction as important and definite, and have attempted to carry it out, although generally, it must be confessed, with indifferent success. It would almost seem that the assessor, in making his award, has considered the satisfactory solution of this problem to be a vital point.

The first premium of 150*l.* has been gained by Messrs. Giles, Gough, & Trollope. Their design (No. 11) is shown on eleven stretchers, and is on the whole worthy of the first place, although it cannot be said to be perfectly satisfactory. The administrative block is in the centre of the front, and is divided into two portions by the main corridor, which runs from it (right and left) to the ward-blocks. The medical officer's apartments are planned on the assumption that he may be a married man; some of the competitors appear to think that medical officers have all taken vows of celibacy. The kitchen department is a one-story building behind the main corridor, and economy and convenience are studied by placing the two Lancashire heating boilers coal-stores, workshops, &c., in a basement under the kitchen department; the basement is approached by an inclined road at the back. The female double ward-block is placed about 65 ft. to the left (that is to say, to the south-west) of the administrative block, and another double block of similar plan but only two stories high is shown at a similar distance to the left of the first block; this represents the future extension of the infirmary on the female side. The lying-in ward is still farther to the left, and is about 50 yards from the female ward-block now to be erected; according to the instructions the lying-in wards "must be provided in a building attached to the females' pavilion,"* although we agree with Messrs. Giles, Gough & Trollope that such an arrangement is not the best, and we are quite certain that a more convenient position could have been found than that shown in their design.

The nurses' home is at the extreme left of the frontage, and is brought well forward from the central corridor. A double ward-block for males is provided for present requirements on the right of the administrative block, and a similar block (but only two stories high) is shown further to the right for future erection. The porter's lodge and receiving wards are placed in the right front corner of the site and the mortuary in the right back corner.

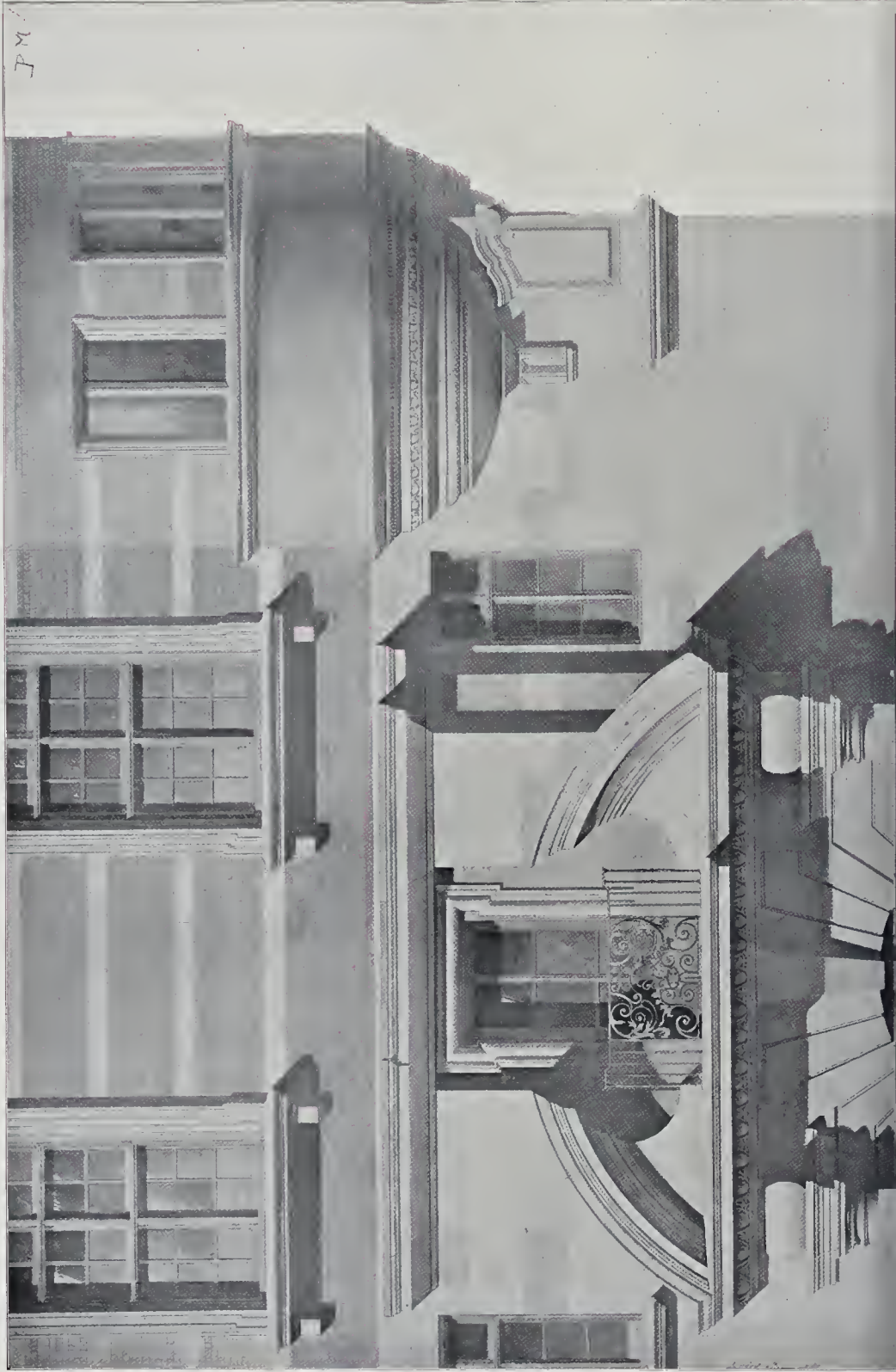
The planning of the porter's lodge leaves much to be desired. It is wedged between the male and female receiving wards, in such a manner that the kitchen forms a passage between the two wards. The kitchen is not a large one, but it contains five doors and two windows. The receiving wards contain three beds each, and are conveniently planned with separate waiting and examination halls, bath-rooms, water-closets, and clothes stores for the two sexes.

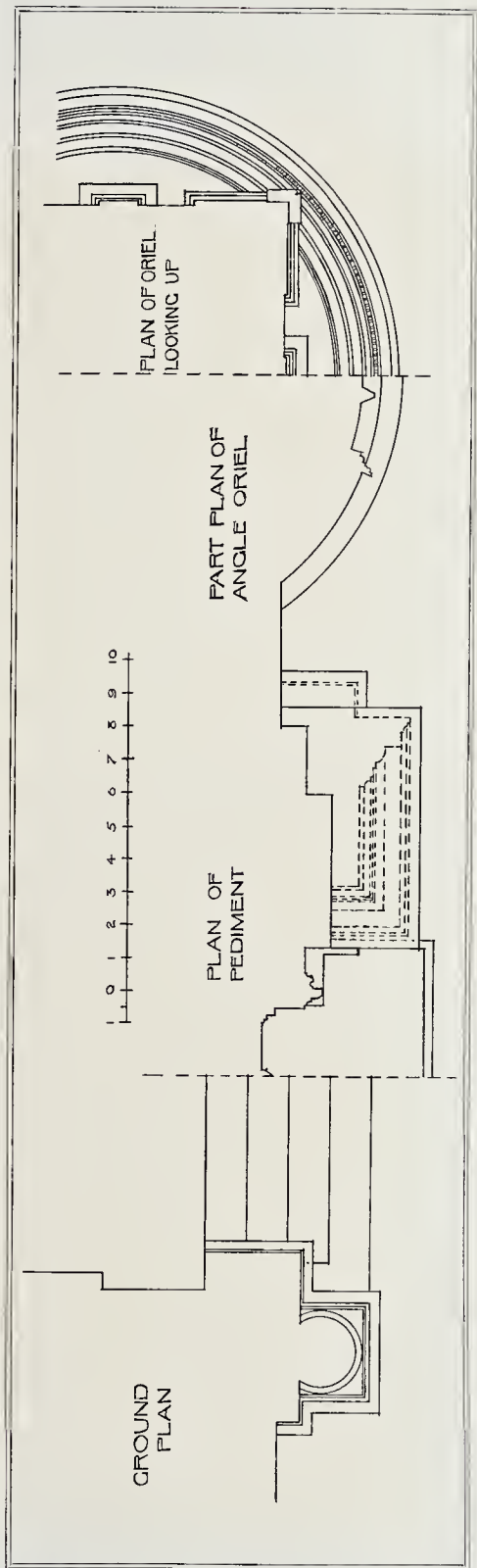
The large wards in the pavilions measure 77 ft. by 24 ft. by 12 ft. high, and the water-closets and sinkroom for each ward are cleverly arranged so as to be entered by a doorway in the canted angle of the ward, and by another doorway in a short corridor approached from the ward corridor. This short corridor is provided with a window. The two doorways already mentioned lead into a cross-lighted lobby, from which the conveniences are entered. The bathroom is entered both from the short corridor and from the ward corridor, and after the bathroom are the lavatory, linen closet, and storeroom. The nurse's duty-room is placed between the main ward and the two-bed ward, and has a ladder adroitly planned in one corner. This arrangement of the ward conveniences is the best submitted; the assess-

* The italics are ours.



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PRINCIPAL ENTRANCE TO NEW SCOTLAND YARD — DRAWN AND MEASURED BY MR. HARRY JONES.

to them is convenient, and they do not prevent a window being placed between the end of the ward and the first bed. An alternative plan is submitted showing a dayroom for patients adjoining each two-bed ward, and entered from the ward corridor. A balcony or verandah is shown on part of the south-west side of each ward; this is an advantageous position, being more sheltered and more sunny than the ends of the wards.

The details of this design are carefully considered, and although there is room for improvement in some respects, it is, on the whole, the best design submitted in the competition. The instructions specified that the buildings must be heated by steam and open fires or stoves. This condition has been observed. The drawings show a rather too simple scheme of ventilation by means of Tobin tubes, and extract flues (in the walls) leading from grates near the ceilings. As the reports are not exhibited with the drawings we do not know the estimated cost of carrying out the design. The limit stated in the instructions was 130l. per bed. The elevations are simple; the three-storied administrative block is the only part of the buildings in which architectural embellishment has been attempted.

Mr. H. Percy Adams, of London, has gained the second premium (100l.). This design (No. 12) comprises nine stretchers, and is an able contribution. The general arrangement of the buildings on the site is in the main similar to that adopted by Messrs. Giles, Gough, & Trollope, but with the following variations: the boiler-house is a separate building behind the kitchen department, and the mortuary is in the rear of the boiler-house; the lying-in ward is attached to the free end of the rear half of the female double pavilion; the nurses' home is on the line of the main central corridor at the south-western extremity, and not (as in the accepted design) placed some distance in front of the corridor; the entrance-gates are opposite the centre of the administrative block, with the porter's lodge on the right and the receiving wards on the left.

The twenty-four-bed wards measure 78 ft. 6 in. by 24 ft., and are planned with balconies at the free ends. As in the accepted design, the duty-room is placed between the large ward and the two-bed separation ward, but the latter is on the opposite side of the ward corridor. At the entrance end of each ward a corridor branches off at right angles to the ward corridor and extends beyond the walls of the ward so that cross lighting and ventilation can be obtained; this corridor leads to the sink-room and water-closets (two for the patients and one for the nurses), which are placed in a square tower planned normal to the wards. This arrangement admits a window between the end wall of the ward and the first bed. The lavatory, bathroom, and larder follow on the same side as the branch corridor. In the angles formed by the main corridor and the rear ward corridor are placed the stairs and bed-lift (in one angle), and a general store, service lift, and room for pairs and movable bath (in the other angle).

The lying-in ward can only be approached through one of the large female wards, and although this position is in accordance with the instructions, it cannot be considered satisfactory. The nurses' home is simply planned, but the internal effect of the octagonal hall in the middle of the longitudinal corridor and of the staircase at one end would be decidedly pleasing and homelike; the smoke-flues, however, from the ground-floor rooms would have to be twisted a good deal to get them into the chimney-breasts on the first floor.

The receiving block has two five-bed wards on the ground floor, with two bathrooms, waiting-room, attendant's room, and hall and staircase between them; the patients' clothing stores are on the first floor.

The administrative block is well planned, but the apartments for the medical officer are insufficient for a married man. The elevations are of a rather quaint character, and the whole design bears evidence of great skill and knowledge.

Mr. C. W. Harvey, the winner of the third premium (50l.), owes his success entirely to the meritorious planning of his design (No. 6A), and not to draughtsmanship or architectural character. The administrative block covers a somewhat large area, but is, on the whole, well arranged, although a vegetable scullery is lacking, and the servants' bedrooms are not happily placed. The block plan is remarkably similar to that of Mr. Adams, but two receiving

wards are shown adjoining the main corridor, between the administrative block and the male and female pavilions. An alternative site for the receiving wards is suggested close to the entrance gates in the centre of the front. The nurses' home can only be described as a dreary building, without any of the charms of a home, either in plan or in elevation, but it contains the necessary accommodation, and the corridors are well lighted and ventilated. The conveniences for the main ward-blocks are so planned that there is no window between the end wall of the ward and the first bed, and the kitchen larder prevents such a window being placed on the opposite side of the ward. As in the first premiated design, the conveniences can be entered either from the main ward or from the ward corridor. Mr. Harvey's arrangement of the conveniences is better than most of the arrangements submitted, but is not equal to those shown by Messrs. Giles, Gough, & Trollope, and by Mr. Adams. The separation wards, storerooms, bathrooms, stairs, and lifts are well arranged, and the planning generally bears evidence of careful thought. Dayrooms are shown at the free ends of the wards. The lying-in ward is attached to the rear of the female pavilion, as in Mr. Adams's design.

Design No. 1 has the lying-in ward immediately behind the administrative block, while the boiler-house is at the south-west end of the main central corridor, and is therefore badly placed for satisfactory working. The ward conveniences are not well planned, and the storerooms are too small. Some necessary rooms are omitted from the administrative block.

The most conspicuous feature of Design No. 2 is a tower 24 ft. square, and about 140 ft. high to the top of the final. Further extravagance is shown in the duplication of the staircases and lifts in the pavilions, and the planning is faulty in other respects.

Design No. 3 has many good features, but is lacking in compactness, and would prove somewhat costly in execution. The administrative block is planned on clear lines, and the boiler-house is placed behind the kitchen department. The ward conveniences and subsidiary rooms are fairly well arranged. Verandahs are shown on the sunny side of the wards, and dayrooms at the free ends.

Design No. 4, shown on nine stretchers, is well drawn, and the elevations are among the most satisfactory submitted, but the planning shows a lack of knowledge of hospital requirements. This is also true of design No. 5. The ward corridors are deficient in light and air, and small lying-in wards are placed on each floor of the female pavilion—an arrangement which would not be convenient for the maternity nurses; this competitor has placed the conveniences at the free ends of the wards. No fewer than twelve stretchers are submitted by the author of design No. 6, and in this case also the conveniences are placed at the free ends of the wards. The conveniences are similarly placed in design No. 7, and the lying-in wards follow the unsatisfactory arrangement of those in No. 5. In No. 8 the conveniences are placed at the corridor end of each ward, but are only accessible from the wards, and do not admit of a window between the end wall and first bed; the duplication of the staircases and bed-lifts in the double blocks is unnecessary.

Design No. 9 is decidedly above the average, and is illustrated by a well-drawn set of fourteen stretchers. The elevations are not without merit, but the tower is an unnecessary and costly feature. Two receiving wards are provided, as in the third premiated design, and the lying-in ward is attached to the main central corridor, as in the first premiated design, but in a more convenient position. The ward conveniences are placed at the corridor ends of the wards, but are not well arranged, and the ward store-rooms are too small. In the administrative block the dispensary is at a considerable distance from the medical officer's room; but, taken as a whole, the design is certainly a good one, although somewhat costly.

In design No. 10 the ward conveniences are placed near the main central corridor, about 50 ft. from the doors of the wards. The author of No. 13 has succeeded in illustrating his design on five stretchers only; it is a good production, but unsatisfactory in several respects, such as the length of the unlighted portions of the ward corridors. The authors of No. 14 have submitted two designs marked

A and B; in the latter the ward conveniences are at the free ends, but in the former they are arranged at the corridor ends as requested in the instructions. This is one of the few designs where this problem has been solved in a fairly satisfactory manner, but the design is so seriously defective in other respects as to be hopelessly out of the running. Design No. 15 shows careful thought, and is above the average.

The reports submitted by the competitors are not attached to the drawings, and it is, therefore, impossible for us to state the estimated cost of the designs, but the three premiated designs appear to be among the least expensive.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, W., the President, Mr. W. Emerson, occupying the chair.

Mr. Alex. Graham, Hon. Secretary, said he regretted to announce the decease of Mr. Newton Edward Jennings, M. Inst. C.E., of Melbourne, Victoria, who was elected a Fellow of the Institute in 1867.

The Royal Gold Medal.

The President said that, as they were aware, on the decease of her Majesty Queen Victoria the gift of the gold medal naturally lapsed, as the medal was a personal gift of her Majesty. As had been previously announced, the medal could not be awarded this year, because the time for its presentation came immediately after her Majesty's decease. After that sad event, some time naturally elapsed before they could approach his Majesty the King to ask him to extend his patronage to the Institute, and to present annually the gold medal; but at the right time they wrote to the proper quarter, and had just received an answer from Sir Dighton Probyn, who wrote that he was commanded to reply that his Majesty would be happy to continue his patronage to the Institute, and also to offer the gold medal, as was done by her Majesty.

The Architects' Benevolent Society.

The Chairman also said he desired to say a few words about the Architects' Benevolent Society, the annual meeting of which was held recently. The funds of the Society were in anything but a satisfactory condition, but for all that he had heard it stated that the Society was in so prosperous a condition that it could not get sufficient applicants for the funds at its disposal. He did not know how such a report could have got about, for it was absolutely untrue, and at the last meeting there were so many applicants (to many of whom it would have been advisable to give sums of not less than 20l. or 25l.) that they were not able to give more than 5l. in some cases in consequence of the smallness of their funds. Moreover, last year the Society wound up with a debt of between 40l. and 50l. The Society made an appeal last year to 5,000 architects to add to the funds, but only ninety responded. He did not think that redounded to the honour of the profession, and if each of the gentlemen written to had given half-a-crown or five shillings, the Society would have been helped very much. Mr. Macvicar Anderson had been so impressed by the necessity for increasing the funds of the Society that he very generously offered to give 50l. to cancel the debt, and had promised to increase that sum to 100l., provided 950l. could be raised amongst members of the profession. A sum of 100l. had since been raised by three gentlemen, and in addition Mr. Waterhouse had promised, and in addition the Chairman, very much hoped that the members of the Institute would do what they could to raise the money before the end of the year.

The Art of Pictorial Mosaic.

Mr. J. H. Brewerton, of Bournemouth, having been elected a Fellow,

Mr. C. Harrison Townsend read a paper on "The Art of Pictorial Mosaic," of which the following is an abstract:—

In introducing his subject, Mr. Townsend remarked on the paucity of published matter dealing with the history and practice of mosaic-work as a whole. M. Gerspach's "La Mosaïque," and Professor Middleton's short article in the "Encyclopædia Britannica," represented the only endopædia towards a

general history or a comparative criticism of the art. For the purposes of the present paper he proposed to consider the subject from the period when Christianity claimed the aid of mosaic-work. The earliest examples handed down to us are of the fourth century. Ciampini's theory that the Church of St. Costanza in Rome had been originally a temple of Bacchus was based on the nature of the ornament; but M. Mintz holds that the mosaics are of Christian origin, though under strong Pagan influence. A fragment of mosaic found in the cemetery of St. Callisto, Rome, and now in the Vatican, is apparently of the fourth century, and is interesting as being probably the earliest representation of the traditional features of Christ. The home of the martyrs Pudentiana and Praxedes, consecrated by the Pope in the second century, was largely altered in the fourth to adapt it to the purposes of a church, when the very beautiful mosaic work, still existing though much restored, was executed on the vault of the apse. This work, which shows the high level to which mosaic art had attained in the fourth century, may be regarded as a compendium of the early or Roman manner, untinged by the influence, later to be predominant, of the Greek canons and ideals. Constantine, after his removal of the seat of empire to Constantinople in 330 A.D., especially favoured the mosaic artist, and during his reign and that of his immediate successors a great number of churches in the eastern part of the Empire were beautified by this art. St. George's, Thessalonica, was cited. The mosaics in the Baptistery at Naples are of the fourth century, which closed under the growing influence and domination of the Eastern or Byzantine.

In the fifth century (c. 422 A.D.) the Empress Galla Placidia, widow of Constantine II., made Ravenna her seat, and it is to her that the city owes three of its treasures—the Baptistery of the Orthodox, the Chapel of the Archbishop, and the Mausoleum of the Empress herself. Describing and illustrating the mosaic work in these buildings, the author drew attention to the pagan symbols introduced in the Christian subjects represented, and remarked on the distinctively Roman treatment of the forms depicted. The very beautiful work in the Mausoleum of Galla Placidia seems, with its absence of gloom yet its dignity of invention, its Roman forms yet its Christian thought, to form the typical example of the fusion of the new and the old creeds. Other examples of fifth-century work still existing were referred to—viz., those at St. Ambrogio, Milan, and St. Sabina, Rome, and the series of mosaics on the Triumphal Arch of St. Maria Maggiore. These latter are particularly important among the early works of Byzantine art, and show the last effort for many centuries towards dramatic representation, before pictorial art became crystallised into conventional and traditional forms. The fairly precise reminiscences of the fifth century contained in the mosaic work of the Basilica of St. Paolo fuori le Mura, which retains the scheme of the original mosaics of Pope Leo I. (440-461), show how the earlier—Roman—symbolism was passing away.

The sixth century is rich in material for study, in both the Eastern and Western portions of the Empire. The gorgeous mosaics at St. Sophia, Constantinople, completed under Justinian in 550, lay concealed for many centuries under coats of whitewash. But in 1847 and 1848 an opportunity of studying the Byzantine mosaics occurred, and Salzenburg made his well-known series of drawings of the old work. Judging from these, there seems to have been a consistent scheme of decoration, a general tone of harmonious quiet colour, with silver largely used for the high lights, and soft green or blue folds in the drapery, and throughout a feeling of the antique or Roman style as it began to be influenced by the sterner, more rigid canons of the East. Touching the present condition of the mosaics of St. Sophia, the author stated that five years ago he examined, with the aid of strong glasses, the ceiling of the gallery, and came to the conclusion that the present whitewash serves as substitute for now absolutely vanished mosaics! The author then passed to sixth-century mosaics at Ravenna, describing those at the Baptistery of the Arians, or St. Maria in Cosmedin; St. Apollinare Nuovo, built in 500 A.D. for the use of the unorthodox, and converted into a Roman Catholic church in 570, traces of both influences being present in its treatment; St. Vitale, built A.D. 526, and utilised as a model for St. Sophia,

Constantinople; and St. Apollinare in Classe, still, for all its sadness of decay, a magnificent contribution to the history of the art. Regarding the art at Rome at this period, the dominance of the Northern races, after the accession of Theodoric in 493, had led to the selection of subjects appealing to and models selected from the strenuous and vigorous Northerner rather than the dreamy and ascetic Eastern. The work is characterised by freshness of treatment, but with a kind of grim hardness in the type of countenance selected—the Roman ideal at base, but with an all but barbaric respect for physical strength.

Seventh and eighth century examples—St. Agnese fuori le Mura and St. Theodore, Rome—were briefly described.

The achievements at Rome and Constantinople during the ninth century must be contemplated in the light of the great dispute of the preceding century as to the representation in religious subjects of the human or divine-human form, and the effect that the various Church rulings had exercised on Christian pictorial art. The result was to check the art along the particular lines affected, but to lead to a reaction during the following century, and the ultimate production of many great and important works. Works of the date referred to included the mosaic in the sanctuary of St. Ambrogio; the very beautiful and gorgeous mosaics of the Church of St. Prassede, Rome; and those at St. Marco and St. Cecilia, Rome.

From the second quarter of the ninth century till near the middle of the twelfth the art underwent in Rome a period of absolute stagnation. During this period, however, notable work was done at St. Mark's, Venice—work in which a Greek or Byzantine influence is manifest. At Torcello, in the twelfth century, a magnificent mosaic was placed on the apse ceiling.

The existence of a purely Sicilian school in Sicily is doubtful; it would rather seem that the Normans, under Roger II., called to their service Greek artists. There is much similarity of sentiment between the St. Mark's and the Sicilian work. Reference was made by the author to work of the twelfth century carried out in the following buildings: La Martonara, Palermo; the Cappella Palatina; the Cathedral at Cefalu, in which the characteristics of Sicilian work, and its affinity with that done at the same time in Venice, are evident; the Monastery of Daphne, near Athens; the Church of the Holy Sepulchre, Jerusalem; and the Church of the Nativity, Bethlehem.

In the Western world the twelfth century produced at Rome the apse of St. Maria in Trastevere, the character of the work still Roman rather than Greek or Byzantine; St. Francesca Romana, often ascribed to the ninth, but, as De Rossi maintains, really of the twelfth century—a very unusual and beautiful design; St. Clemente, Rome, dated by M. Gerspach as of the thirteenth century, but which the author placed as early in the twelfth, the work exhibiting a treatment rather apart from the usual motifs of Roman work.

In the thirteenth century the great scheme at St. John Lateran was executed for the Pope Nicholas IV. by the master-artist Jacopo di Torrita or Torriti, the design being signed by Jacopo and his worthy assistant, Camerone. The author next discussed the mosaic decoration carried out in the same century in the Baptistery at Florence and in the Cathedral at Pisa, and the further prosecution in the thirteenth and fourteenth centuries of the mosaic scheme for St. Mark's, Venice.

At Torcello the school of mosaic work showed a pronounced difference of aim and style from that of the same period in Venice. In this more Byzantine manner was executed the strange composition on the west wall of the cathedral—a work more probably of the fourteenth century than of the twelfth, to which M. Gerspach assigns it. The Greek mosaists had now become widely spread over the north of Italy, and had done notable work at Florence, Pisa, Siena, and Orvieto.

Rome saw two important works achieved in the fourteenth century, of which perhaps the principal was the completion of the fine work in the apse of St. Maria Maggiore, commenced by Jacopo de Torriti, and of the panels below it executed by Gaddo Gaddi.

In the fifteenth century Baldovinetti executed one of the overdoor spaces at the Baptistery, Venice, and his pupil and Michelangelo's master, Domenico Ghirlandajo, commenced in the cathedral the decoration of the Chapel of St. Zenobio. The really important works of this

century occur in the Chapel of the Mascoll at St. Mark's, Venice. These represent the principal legends of the Virgin, and in composition, colour, and execution are all admirable. It is with these panels that one approaches the end of the art of mosaic work from this point one sees the mosaicist, designer and executant in one, make room, to the ultimate destruction of his art, for the painter who called to his aid the "dull mechanic" hand of a workman to represent servilely painted pictures by means of cubes of glass.

The state of design rapidly became worse and worse. The seventeenth and eighteenth centuries saw work accepted and praised, though it transgressed, in its realism, its exaggerated movement, its rendering of accidentals, all the rules and canons that should regulate mosaic work. But it was reserved for the nineteenth century to strike the worse note of imitation and not only to execute indifferent mosaic, but to falsify the history of the Church as recorded by and on its walls, by treating the mosaic designs as pseudo-thirteenth-century work.

The author concluded with some observations on recent mosaic art in England. He cannot be said that some of the works are successes, save as to execution. The artist seems unwilling to suppress, as the loyal mosaicist should, many of the attributes of which, under other circumstances, he might justly be proud. The author expressed his conviction, however, that it would have been impossible to find in either France or Italy an artist who would have carried out work recently executed in England without falling still more egregiously into the errors which the great examples of the past showed to be present therein.

Mr. Walter Crane, in moving a vote of thanks to Mr. Townsend "for his admirable and interesting historical account—from the earliest period down to the present time," said the comprehensive way in which the lecturer had compressed so much within the limits of his paper was no small part of the difficulty of such a paper. Mr. Townsend called the subject the art of pictorial mosaic; he (the speaker) supposed that the question of "pictorial" or "decorative" was a mere matter of the interpretation of words. One might say that the mosaics which were most decorative (judging from the lantern views they had seen) were the least pictorial—he did not say in all cases, but in most cases. He was conscious of a certain loss in the views of the mosaics they had seen—a loss as to colour, he meant. It struck him that a photograph very imperfectly represented the real beauty of a mosaic, and one only got a kind of skeleton in some of the representations they had seen. The mosaic which appeared to be the most decorative of those they had seen, in the sense of pattern, was the procession of virgins (from St. Apollinare Nuovo), which consisted of a series of repetitions. There was a saying attributed to William Morris that mosaic was like beer: a little of it was no good. In view of the many experiments that had been made in the application of mosaic to buildings, he felt that was true. It was no good putting little snippets here and there, and calling that mosaic decoration. Though it indicated great sacrifice on the part of the architect to leave the surfaces of his building plain so as to give scope to the decoration, still mosaic did seem to be one of those arts in which, if it were to be done with justice, to the field must be left clear. Mr. Townsend showed a slide representing a work of the early fourteenth century—an example of mosaic treatment which the lecturer considered reached the limits of pictorial decoration, and he then spoke of the restraint of the designer. The mosaic designer of that period worked on precisely the same lines as the painter; the designer introduced perspective and a considerable amount of architectural background, just as the painter would have done; there was no necessity for any difference between the two. In the present day, however, a mosaic artist had to separate himself, as a rule, from all that the contemporary painter was doing, and to put himself into a totally different world—not necessarily the antique world—but, at any rate, he had to satisfy architectural necessity, and was put under what was called "restraint," and had to sacrifice a great deal that was popular and current in the pictorial art of the day. He (the speaker) very heartily echoed the wish of Mr. Townsend that we might have more decoration in our cities and towns, especially in this

grey world of London, which (in some parts at least) might be very much gilded inside, but had little gold outside. He hoped that mosaic one day would take the place of the poster on our exterior walls.

Mr. K. Anning Bell, in seconding the vote of thanks, expressed his amazement at the analytical power shown by Mr. Townsend in separating the centuries. He had seen most of the mosaics referred to, but his mind was quite confused as to their dates; he had always looked at them from the craftsman's point of view, not from the historical standpoint. Viewed historically, it appeared that the Art of Mosaic, as shown by the earlier Roman examples, was taken originally from painting, and the earlier work showed less appreciation of mosaic in its proper treatment than that of the middle period did. There were several points in the middle period which appeared to him to show a more elastic aim. After the eleventh and twelfth centuries the mosaicists seemed to be carried away again by the idea of painting. In the middle period there was not any painting. In the third century the Roman work showed that the mosaicists were men brought up as painters, and they carried the same idea of art into mosaic as they had in their painting. That was carried on by their pupils for some little time, but gradually mosaic dominated, and in the period when there was no painting to call painting—in the tenth, eleventh, and twelfth centuries—mosaic was found at its very best. When painting became prominent again, as it did in the fifteenth century, mosaic began to deteriorate. As to the technique, there was a great deal left to be done which the old masters did not quite touch in their day. He had seen, he believed, all the Italian and Sicilian work, and some little of that done in Egypt—not pictorial, but good work, and charmingly designed. They did not appear ever to have considered much the value to be got from the difference in the size of the tesserae and the difference in size of the interstices. No end of value could be got by varying the interstices, placing them further apart and making the tesserae large or small. One could get the emphasis on a piece of work like a face by putting the tesserae quite close and making the particular feature a solid mass with the surroundings rather looser. In that way attention was drawn to the part which was a solid mass, and quality could be got by making the other bits—trees or drapery, &c.—vary with the looseness of the tesserae. Such features of the work could also be made to vary by the size of the tesserae: thus they had two methods of getting variety to play with, but the tesserae must not be made big. He had tried big tesserae, and they looked like tiles, and the effect was most unpleasant. For exterior work they could afford to have the tesserae larger than for interior work. In interior work mystery was the essential beauty of mosaic, whereas for exterior work they could not get mystery, and they should not strive for it. In doing the work inside a low light was wanted, at least a vague and not a direct light—a side light which softened it; and as many lights as possible—not one. The best churches designed for mosaic that he knew were St. Mark's, Venice, and the Capella Palatina at Palermo. These each had the lights low in the dome, but in an ordinary church with nave and transepts it was not quite so effective in getting the colour. This applied, perhaps, mostly to gold, and in gold mosaic work (and the old work was mostly gold mosaic), in order to show its beauty to the greatest extent, a curved surface was needed, such as over domes; but on the flat it was not quite so successful, and one always felt that the whites, the greens, and blues tell as of greater value than the gold itself. He thought, from the workman's point of view, just as in the case of the old work, one must look at it and see if one liked it: the old mosaicists experimented, as we do. He had seen them try red and gold and yellow and gold; the red sometimes came off, but yellow never did. Yellow and gold were like white and silver—each knocks out the other. As to placing the tesserae, he thought they could not make their work satisfactory without placing them from the front on to the wall; they could not do the thing on bits of paper face downward, as had often been done recently. Another point was that the colours carry rather differently: the colours themselves seem to tell differently, from the spectator's point of view, from what one would expect from a close view, and they tell differently

also according to the different make of the glass itself. The artist buys a lot of glass stuff to use for his mosaic, and he finds that some of it will carry the colour further than other bits, so that he must look to that himself. The man who executes the work will try to match the artist's cartoon as far as a piece of transparent glass can match a piece of water-colour—which is very slightly; but when one gets fifty, seventy, or one hundred pieces, some will carry further than others. Some glasses hold the light more; some are more opaque; some, being transparent, hold a shadow from the piece above; and, apart from the texture of the glass, the colours themselves carry very differently. In outside work gold was seldom a success; even in the old things that he had seen the gold did not do with the outside at all—the remaining half dome at St. Mark's excepted; but the effect of a half dome was practically that of an interior, and the light was reflected from below: it wanted mystery and a vague soft glow to make it look at all well. In the case of gold mosaic the best result in the work was got by using cool colours, and that seemed quite natural. If there was a large mass of gold it dominated everything as a warm colour, and what was wanted with it was a cool colour. He found that, doing work without gold, he wanted warmer neutrals.

Mr. T. R. Spence said Mr. Townsend had not mentioned one of the most magnificent examples of mosaic work from a decorative point of view, and that was the dome in the shrine of Omar, Jerusalem, which stood in the Temple area. It seemed to him to be a very fine thing as a piece of decorative mosaic, and it was treated entirely with ornament. It was a very difficult matter to treat a dome with figures; they should be worked really into the ornament. He did not think that any dome could be treated successfully in storied figure subjects; the decorative intention should be dominant. He quite agreed with Mr. Anning Bell that gold should always be used in the interior, because much greater tone was got from the variety of light and shade.

Mr. J. D. Crace said he would like to join in expressing thanks to Mr. Townsend for his excellent paper, which was so especially interesting from the historical point of view. There were one or two technical points which had struck him, and one was the importance, as the old mosaicists recognised, of carrying gold (in the case of a gold background) into the subject, and not confining it entirely to the ground—allowing it to go, for instance, into the drapery of figures; it was only in that way that the figures would ever be saved from being detached from the ground itself. Everyone must have been struck, in looking at the lantern views they had seen, by the entire absence of mouldings, and one could not be too much impressed with the fact that moulding and mosaic did not go together, and that the mosaic treatment must be kept distinct from what one might call architectural expression in the more delicate sense, and from that point of view he thought it was fair to deprecate the use of mosaic in little patches, and as it had been used in this country only too frequently during the last thirty years—especially in little patches on the level of the eye. That was what mosaic was absolutely unfitted for, for if it was opposite the eye one saw the glare of the gold and nothing else, and if against the light, one saw practically no subject at all. The earlier examples of mosaic work were very few. Mr. Townsend did not allude to the examples from Pompeii, where there were one or two instances of the early *Illostromata*, as they were called. Pliny spoke of mosaic having first come into use in the form of pavement in the time of Sylla, and went on to say that "since that time mosaics have leapt from the floor to the vaulted roofs of our houses." That showed that mosaic must have been in very early use as a form of decoration, and its use appeared to have been almost continuous, although its mechanical treatment varied very little, considering the variations in the details of the art.

Colonel Prendergast said the paper had been one of the most interesting they had heard in that room; it was a most careful exposition of a subject about which none of them knew very much. But he would very much like to hear something on another aspect of that important subject, *i.e.*, its technique.

The Chairman, in putting the vote of thanks to the meeting, said Mr. Townsend's extremely interesting paper was entitled "The Art of Pictorial Mosaic," but the lecturer had given

them a history of pictorial mosaic. He (the chairman) would also like to hear something more of the technique of the art. It would be most interesting to devote another evening to a paper on that side of the subject, and he would propose that next session this should be done.

The vote of thanks having been heartily agreed to,

Mr. Townsend, in reply, said he had to treat the subject from either the historical or the technical point of view, for there was material enough for two papers. He hoped that the proposal that had been made to devote an evening to the practical side of the question would be acted upon.

The Chairman said that the paper by Mr. Francis Bond, which was to have been read at the next meeting on April 1, would be postponed until April 22, and the Art Committee's paper, arranged for April 22, would be read on a later date in the session. The meeting on April 1 would be devoted to a discussion on "An Amended Form of Conditions of Building Contracts."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION:

ROWTON HOUSES.

THE usual fortnightly meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., the President, Mr. W. H. Seth-Smith, in the chair.

The minutes of the last ordinary general meeting and a special general meeting having been read and confirmed, Messrs. R. H. Murray and C. R. Pinsent were elected members of the Association.

Mr. R. S. Balfour, hon. secretary, proposed the following votes of thanks: to Mr. J. F. Bentley for permitting the visit to the new Catholic Cathedral at Westminster on Feb. 16; to Mr. F. B. Wade for permission to visit the School of Art Needlework on the 2nd inst., and to Messrs. Broadwood & Sons, *re* the visit to their pianoforte exhibition on the 9th inst.

The votes of thanks having been agreed to, Mr. H. B. Measures read the following paper on "Rowton Houses" —

Rowton Houses (the subject of my paper this evening) are the outcome of a desire upon the part of Lord Rowton to provide decent accommodation for a large body of men who at the time were practically unprovided for. Lord Rowton had for many years been deeply interested in the many-sided problem of the housing of the working classes, and during his researches in the poorest districts he was greatly impressed by the need of some decent provision for the numbers of men who had no homes of their own, and generally used the common lodging-house.

From the commencement he appears to have set before him as an ideal that anything that was done must be on a business basis of "self-support." There was to be no question of a "charity scheme," but that those who used the buildings should do so with the knowledge that the charges made entitled them to what they enjoyed. The idea was generally scouted as impossible of realisation, and, in addition, that the class of men would neither appreciate nor use in a proper manner any such endeavours upon their behalf. Lord Rowton was fortunate in infecting Sir Richard Farrant with his enthusiasm, with the result that he added the weight of his experience, and it was finally decided to build Rowton House, Vauxhall, containing 475 beds, which was opened to the lodgers in 1893. The opening proved that Lord Rowton's estimate of the possibilities of such a scheme was correct; it was also a financial success, and has continued to be so. A company was formed with Lord Rowton as chairman for the purpose of extending the building operations. The Vauxhall House was taken over, and the building at King's Cross, with its 677 beds, was opened in 1895. This was followed by the house at Newington, with 805 beds, in 1897; another at Hammersmith, having 800 beds, in 1899, and the building in course of erection at Whitechapel, which should be ready for occupation this year.

Time will not permit of a detailed description of each Rowton House, I therefore propose to describe the house at Newington Butts, containing as it does practically all the essential features of a building of this description and,

moreover, because the site is one which both in frontage, depth, and general disposition, is as near as possible an ideal site for the purpose of providing accommodation for 800 men.

It is situated in a very crowded neighbourhood, frequented by the class of men who have in the past had to crowd into small houses as the lodger, or go to a common lodging house, with all its degrading surroundings. For the workman the position is one affording exceptional facilities for access to the heart of London, consequent upon the proximity of railways, including the South London and the tram and bus routes in all directions.

The site has a frontage of 214 ft. overlooking a well-laid-out public recreation ground, the site of the disused churchyard of St. Mary Newington, and is approached by a wide footway from Newington Butts. The depth of the site from front to back is an average of 138 ft.

The building is set back from the forecourt railing a distance of 10 ft., and as the ground floor is 4 ft. above paving, ample light is obtained for that portion of basement which is on the front of the building; at the back the main building is set back a distance of 25 ft. from the boundary. This gives a considerable space for light and air, whatever the adjoining owners may hereafter do on their land and, in addition, the dimension just enables the building to be erected to the height shown on section, without coming within the Building Act angle of $63\frac{1}{2}$ deg.

The central courtyard above ground floor has a width of 58 ft. 6 in.; this is wider than I have been able to obtain at either Calthorpe-street or Whitechapel, the latter being 49 ft. 6 in. wide, which I consider gives ample width, but is not so convenient for planning the ground-floor rooms as a width of, say, 60 ft. You will note that in all the plans, the plan of cubicle floor is based upon an elongated letter U; this I consider to be the most satisfactory form for planning, and preferable to an enclosed quadrangle; with the latter it may be possible to produce a large central staircase, but I do not advocate such in preference to those shown. The shape adopted gives an abundance of light, sunlight, and fresh air into the courtyards, and lends itself to the disposition of staircases at the extremity of each arm. I need hardly point out to you that with the staircases planned as on all the drawings before you, it is impossible for a man to be trapped in the event of fire, a thing that is likely to happen with a central staircase unless panic stairs are provided—these are expensive and would probably be overlooked in case of need.

The elevations are built in pressed Leicester bricks and mingled gaults, and the dressings in pinky buff terra-cotta. The whole of the interior walling is built with gault bricks, excepting where glazed brickwork is used. The brickwork throughout the building is in Portland cement.

The floors are breeze with steel joists, the breeze covering the underside of joists $2\frac{1}{2}$ in., the top screeded over joists for flooring.

The front roof is constructed of breeze slabs 4 in. thick, with angle iron therein, and the slating nailed direct on to the slabs, all other roofs are flat, of breeze and steel construction, covered with asphalt.

For administrative purposes the house is divided into five sections as follows:—

1. Lodgers' day-rooms;
2. Lodgers' cubicles;
3. Catering section, which includes sleeping accommodation for females employed in shop, kitchen, and scullery;
4. Bed-makers;
5. Superintendent's apartments, with separate accommodation for the office clerk.

If you will allow me for the purposes of this paper, I will assume that you are accompanying me upon a tour of inspection, following very much the course that a lodger would take. On entering the building, an office is provided in the vestibule; here the lodger makes application for a bed ticket, for which he is charged sixpence; this frees him to the use of all the day-rooms of the house and separate sleeping accommodation for one night. If he desires to do so, an opportunity is allowed him of renewing his bed ticket up to 9 o'clock at night, before which hour no new lodgers are booked, or he may take a bed by payment of 3s. 6d. for a week. A lodger can renew his cubicle from day to day, or by the week, so that he has the exclusive use of it. The office front and fittings in same are in polished teak, and a safe is provided for the custody of

any valuables or money given in charge of the clerk. Opposite the office window turnstiles are fixed; they serve as a "moral barrier," it being impossible to use them for checking purposes, as the lodgers are in and out of the building at all times. The space beyond the vestibule is a provision not only to give room where there is much traffic, but, in addition, to give sitting accommodation in what is a favourite place with the lodgers to watch the arrivals. These spaces and the corridors leading from them, past all the day rooms to the two cubicle and basement staircases have glazed brick walls from floor to ceiling, with a dado in chocolate and cream coloured bricks and ivory above. The floor is cement and granite chippings. Water for drinking is laid on to point shown on plans.

The dining-room has a floor space of 5,300 ft., and seating accommodation is provided for 440 men at tables; a number of extra seats and wooden easy chairs are placed in the room. The walls have a glazed brick dado in chocolate and cream, 4 ft. 9 in. high, with plastering above dusted to tint. The floor is of oak blocks laid herringbone. Tables and seats are teak, carried on cast-iron standards, the length being 7 ft., giving a provision for eight at each table. Four large cooking ranges, with ovens, hot plates, and grills are provided. These you will note are placed out of the line of traffic, and are built into glazed brick chimney breasts from floor to ceiling; this is necessary, as plaster work becomes discoloured in a very short period.

The portion of dining-room between the front and back wings is, in addition to windows, top-lighted and ventilated by four lantern lights, the whole of sidelights in which open for ventilation; in addition, all the windows are hinge-hung to fall in above transoms, and casement-hung below, the latter being secured by a latch and usually only opened for cleaning purposes; ventilation flues are also provided in walls.

A lodger may purchase cooked or uncooked food at the shop, or he is at liberty to bring his own purchases from outside and have the free use of the ranges, cooking utensils, and lodgers' scullery for the preparation of such food. You will note by reference to the photographs in the room that the walls are hung with framed engravings of many popular pictures, a feature in the furnishing which appears to be much appreciated. Between the two large sections of the dining-room a lodgers' scullery is provided, with walls built in glazed brickwork from floor to ceiling, fitted up with glazed fireclay sinks and teak draining boards. Sanitary pails are under each sink for the reception of potato peelings, tea leaves, &c.; hot and cold water is carried to each sink, and, in addition, a supply of boiling water is provided for tea-making, &c. This scullery is an essential, as otherwise the dining-rooms would be used for this purpose.

The crockery and service room between the dining and smoking rooms is built in glazed brickwork from floor to ceiling and fitted up with shelving. This is provided for those who cook their own food, and is furnished with pots, frying-pans, teapots, plates, cups and saucers, which are at the lodger's service, and which he leaves where used by him, to be collected by porters, who send them down the lift shown to basement scullery.

The shop has a teak front with sliding sashes, and is fitted up with counters in teak, hot plates, urns, and drawers and shelving for the varied assortment of articles sold. A tobacco licence is held. The prices charged are practically what would be paid outside at the cheapest class of coffee-house. The lift shown delivers into a service lobby outside kitchen and also into the scullery on basement, and the staircase gives access to same.

The smoking-room is approached from corridor and from dining-room. The floor space is 1,600 ft., and is fitted up and finished in a manner corresponding with dining-room; the seating at tables is for 112, with an additional seating accommodation in wooden easy chairs. The chimneypieces are in glazed faience, and large open fires are maintained. Although this room is called the smoking-room, smoking is allowed in any portion of the building used by lodgers during the day. This room is at times of pressure—say on Sundays—used as an overflow dining-room with service from shop where bay is shown.

At the back of building is the reading-room. This is an L-shaped room with an area of 2,550 ft.; the walls have glazed brick dado

with plastering above as in dining-room, the chimneypieces in glazed faience. Seats at tables provide for about 170 men, and a large number of easy chairs are provided around the fireplaces. It is very seldom that one can visit the house without finding each fireplace with its semicircle of men, reading, talking, or having a nap. You will notice that in all these rooms the doors are set into a recessed lobby; this allows them to open outward without projecting into the corridor, and, in addition, it is possible for the superintendent to obtain a view of the room while standing in this lobby to see that order is maintained.

The walls are hung with pictures, and two large teak bookcases filled with the works of a variety of authors are provided. Books are lent to lodgers on application to the superintendent. Games, such as draughts, dominoes, &c., are placed in the room.

Adjoining the dining-room you will note the locker corridors. The position assigned to these is the most convenient where planning will permit, as they are used for storage of food to a great extent. In the house under notice they are 1 ft. 6 in. cube, with a shelf dividing into two parts. Of these lockers there is a provision of 800; they are arranged in tiers four in height, and each locker is ventilated and numbered and has a separate key. Above these lockers a number of larger lockers of double the cubic capacity are provided for those who require additional space. Provision is made in them for a stick or umbrella, and a shelf similar to the smaller lockers. The charge for a small locker or a large is 6d. and 1s. respectively, and upon the return of key, 5d. and 1s. respectively is returned, which to a regular lodger is to all intents a charge of 1d. or 2d. for a year or more. In the locker corridors small tables are placed against the piers for brushing or sorting articles in lockers. The corridors are lighted and ventilated at ends by windows in addition to top lighting and ventilation.

The water-closets and urinals for day use are placed at the rear of building, and are disconnected from it by a ventilated lobby. The walls, partition walls, and divisions to urinals are all ivory glazed brickwork. The roof over is in lantern form, glazed from end to end, in T-iron bars, with vertical pivoted louvres. There are forty-one water-closets being a provision of one for every twenty men. The division and front walls are 6 ft. 3 in. high with a moulded capping and open above; each water-closet is fitted with a flushing cistern, having an iron supply pipe to pan. The pan and trap used are of the short hopper type. Glazed brick "soap size" is used for risers, and the whole of the space inside same, around pan and trap, up to the top of pan is filled in solid with cement concrete. This is found to be a perfectly effective means of avoiding breakages, wilful or otherwise. The seats are teak, bedded and screwed down on to the concrete. The doors are kept up 3 in. above floor for ventilation. The door stops and the hinges are slightly out of the perpendicular; the effect of which arrangement is that, excepting when the door is bolted, it automatically opens back on to the division wall, and by that means a lodger is always able to find which water-closets are unoccupied. The door frames are doweled down to 2-in. cement base blocks. The floor of water-closets is laid with a fall towards door, and constructed in concrete with granite chippings. The urinals are white glazed fireclay backs, finished on the front edge with 9-in. double bull-nose divisional piers, which are carried to a height of 5 ft. The top of urinal backs is covered down with slate overlapping copper sparge pipe with automatic flushing. This mode of construction has been found to stand, undamaged, the hard wear in each house. Adjoining these water-closets, near the foot of main staircase, a room is provided for fumigating bedding or other articles.

At the extreme end of back corridor a staircase is constructed, giving access to the roof over the portion of ground floor rooms within the centre courtyard; this roof is at first floor level and is paved with asphalt, fenced in, and provided with seats as an open-air lounge, and smoking space; it appears to be a much appreciated feature.

Basement.—The two main staircases are continued down at the end of ground floor corridors to the basement, a corridor leading from each into the lavatory. In passing I might say that the whole of the basement,



Roulton House, Newington Butts. General View.

where used by the lodgers, is built in glazed brickwork from floor to ceiling, and all the floors are cement concrete finished in cement and granite chippings.

The lavatory has a dado in French grey and ivory, with ivory above. There are eighty basins, fitted with hot and cold water supply, the construction being as follows:—Each set of ten is carried on three divisional walls with angle-iron bearers to carry slate top; the basins are white enamelled fireclay, with outer rim bearing on iron bar on edge, bearers shaped to basin and bolted to outer angle irons. Immediately under the slate top two horizontal water pipes, hot and cold, are carried from rising mains, on main walls, through to end division, with a plug for clearing in the event of a stoppage; branches rise vertically to gun-metal screw-down cocks. Iron waste pipes are used, discharging over channel in floor; for basins, loose turned wood plugs are used. The floor is laid with falls to the channels under these lavatories. Towel rails are fitted at ends of ranges and on walls with round towels supplied thereto. Central over each range of basins and running longitudinally a hat and coat rail is fixed.

A portion of lavatory is screened off by a glazed screen and fitted up with white glazed fireclay feet washing baths, with teak draining boards between each. Hot and cold water is carried to each, and the wastes discharge over a channel similar to the lavatories. I consider this room to be a great boon to the men, and it is much used by them. Towels are provided. In the front corridor leading from lavatory to the foot of main staircase you will note there are bath and dressing rooms; the walls are divisional walls 6 ft. 6 in. high, in glazed work, and the baths are white glazed fireclay, with a riser of glazed brickwork and finished with a teak top. I might mention here that baths uncased were tried in the first house, but the space around them, next to the walls, too often proved a receptacle for discarded underwear. Hot and cold water is laid on to each bath. A lodger pays 1d. for a bath ticket, which includes soap and towel; the water is turned into bath by the attendant. A chair completes the furnishing of bathrooms.

The dressing-rooms are to all intents and purposes as bathrooms, minus the bath. As no lodger is allowed in his cubicle during the daytime, it was considered and found to be necessary to provide accommodation to enable him to change his garments.

In the corridor connecting front and back staircase you will find a room described as "the lodgers' washhouse." Here, and particularly on Sunday, many wash the whole of their wardrobe of underwear, for which purpose white glazed fireclay washing-troughs are fixed on walls, with hot and cold water supply and draining-boards. A wringer is part of the equipment, with tables for the folding or sorting of garments. A Gill stove, surrounded by a galvanised-iron framework clothes-horse, is used for drying. In the same corridor, adjoining the lodgers' washhouse, is the porter's day room. This is fitted with lockers, tables, and easy-chairs for the officials' use during their leisure and at meal times. On the opposite side of corridor two rooms are allotted to a repairing shoemaker and a tailor, who find constant employment from the lodgers. Returning to the main back corridor, you will note a space between porter's room and lavatory; this is used as a boot-cleaning and clothes-brushing space, tables and foot-rests being placed therein. Opposite this space is another partly in use, the unused portion being a provision for extra locker accommodation, that in use being a parcel-room. A lodger with tools, boxes, or other belongings too large for lockers can, by payment of a small fee, store them here, and have access, in company with an official, from time to time. The barber's shop is fitted up for the purpose, and provides constant employment for a barber. The knife-cleaning room and the fitter's room adjoin, the latter being fitted with vice, &c., for minor repairs.

In the furnace-room two boilers supply the whole of the hot water used by lodgers for lavatories, baths, &c.; these are connected to two cylinders, each of 250 gallons' capacity, placed in linen and blanket store. A drying-room, fitted with galvanised iron frame-work, is built upon the setting of boilers, and utilises waste heat for drying purposes.

In the passage outside, at left end of buildings, 11 ashes and refuse from day rooms is fed in sanitary pails for removal by autho-

rities by the steps shown in area. All area walls and voids are in glazed brickwork.

Section II.—Cubicle Floors.—Returning to the ground floor of building, you will note the two main staircases giving access to the cubicle floors; these are carried up the full height of building, with steps of a uniform width of 4 ft. 6 in. to the flat roofs at top, where a gang-way is railed in from one staircase to the other, enabling lodgers in case of fire to ascend one staircase and descend by the other. The staircase is built in ivory glazed brickwork the full height, and the steps are formed of Portland cement with two angle-irons in each; the balusters and handrail are wrought iron. On each landing, approached by a door of same, is a sink space with hot-water supply for cleaning purposes, and cold for drinking, carried to a glazed fireclay sink. On each side of sink space a watercloset is formed, constructed as those previously mentioned, for night use only. A fire hose cupboard, fitted with hose-piping and nozzle, occupies the space marked FH on plan, the corresponding cupboard opposite being used for storage of brooms, &c., for cleaning of cubicles.

Taking the cubicle floor as a general scheme you will observe that it consists of a central corridor 4 ft. wide, extending around the U-shaped building, from staircase to staircase. It is divided by partition walls into sections, varying (according to convenience in planning) of from twelve to sixteen cubicles in each. Where possible, I endeavour to plan in sections of sixteen, for a reason which I will explain when dealing with lighting. Among other reasons, for the subdivision of cubicle floors into sections, are the checking and possible isolation of an outbreak of fire; another advantage is that, in a case of infectious or contagious disease, the isolation and efficient disinfection can be arranged without closing the whole of one floor of cubicles. Swing doors between each section conduce to quietness between each section; fanlights yellow these open for ventilation. The flooring is over these open for ventilation. The flooring is yellow, nailed direct upon the screeded breeze floor. The staircase in the internal angle of front section admits of the women bedmakers obtaining access to the various floors without passing through any of the lodgers' day rooms. The space where staircase is shown on first floor is occupied on all the other floors by a linen room, with lift from clean and soiled linen rooms in basement. This is placed as near centre of cubicle corridors as possible to avoid labour in carrying. On each floor, including one on each staircase, there are five fitted fire-hose boxes, with glass panel in door for access to bolt.

A typical section of cubicles is planned eight on each side of corridor, handed right and left from the centre of section. This method of handing from the centre is one that I consider most essential; it enables each bed to be against a cubicle partition on the other side of which is the passage space of the next cubicle, and not the bed; any reversal of this arrangement means that sleeping next to a restless or noisy sleeper would be a most unpleasant experience. You will also note that every cubicle in the building has its own window opposite the door, leaving a pier against the head of sleeper; those of you who have had the misfortune to sleep with the head immediately under the chilled atmosphere at a window will realise that this is not a small point in planning. The windows all have a high bottom bead permitting the raising of sash for ventilation at meeting rails, and the sashes are double hung and of an uniform width of 1 ft. 6 in. in the brickwork, carried up to within a few inches of ceiling. The framing for cubicle partitions is 3 in. chamfered frames filled in with 1½ V-jointed and tongued boarding, painted to a cream shade and twice varnished. The cross partitions are 7 ft. 6 in. high, and the partition next corridor 6 ft. 6 in. high, the height of cubicle floors from floor to ceiling is 9 ft. The door of cubicle is kept up 2 in. above floor for ventilation, and has a bow handle outside and bolt inside. At the foot of bed three hat and clothes hooks are fixed with a shelf projecting over and covering same, making it impossible for garments to be lifted off hooks over the partitions at night by other lodgers (a necessary safeguard). The cubicles are, excepting where breaks on elevations increase their length, uniform in size throughout the building, the minimum standard of 5 ft. wide by 7 ft. 6 in. being adopted, the beds are 6 ft. 3 in. by 2 ft. 6 in. over all, the space at the end next

corridor permitting the drawing out of bed for making and the hanging of clothes on pegs; the minimum floor space of each cubicle is, therefore, 37 ft. 6 in., and the cube air space, taking half the corridor for each cubicle, is a minimum of 427 ft. 6 in. I may add here that to provide for ventilation, independent of the windows in cubicles, which the occupants may keep closed, windows are planned at the end of corridors, and these, the fanlights over swing-doors, and the staircase windows enable the officials to let a current of fresh air through the various sections. With reference to the cubicle partitions, I have had various opinions from architectural friends as to the material used, some advocating wood material and others another. I can but give the result of experience extending over several years' user of these partitions, and it is, that although there have been several attempts to set them on fire by setting a light to the bedding, they have charred only; they are not troublesome in dealing with an occasional case of vermin. I have been surprised myself to find that they are free of carving or writing and that any damage by the shifting of bed has been of the nature of an indentation of the surface only, whereas, where plaster is used on the external and other walls, damage is done which is not easy to make good. While speaking on this matter, I would claim your indulgence, when viewing a Rowton House outside, for the regularity of windows and piers; I have told you my reasons for the arrangement of windows and piers so far as they affect the sleeper. From time to time I am asked, Why don't you group your windows? If I yield to that temptation, the result is elevation. Personally, I think the sleeper comes first, and that the elevator should truthfully proclaim it. On the top floor of building, at the back of sloping roof, you will notice a row of cubicles. These are of one side of corridor only (excepting in cubicle where they are on both), and the dormers in front are a provision for cross ventilation. On each floor two rooms are reserved for officials, who sleep there and are responsible for order. They are fitted as small bedrooms, and the space from top of partitions to ceiling is glazed for privacy. The staircases are lighted by a point on transom of door leading to sink space. This gives in addition sufficient light into sink space and water-closets through glazing of fanlights and doors. Taking a typical section of sixteen cubicles, two gas points are sufficient for lighting. Each is set opposite the second cubicle partition from door, and thus lights four on each side. There is not sufficient light for reading in bed, but ample for undressing.

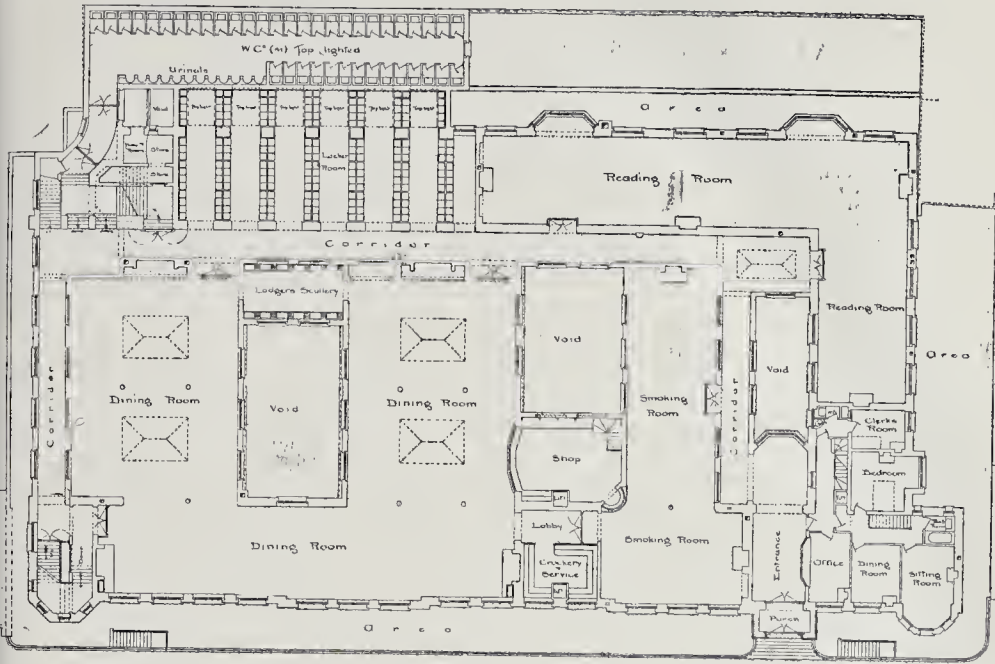
The gas points on staircases and at points on ground-floor corridors are a light all night, and in addition at the change of direction corridors on cubicle floors a point is also placed all night that a lodger may be able to find his way out at any time. The other gas points are controlled from the office when necessary.

The furniture of a cubicle consists of an iron bedstead, spring mattress, a mattress cover, horsehair mattress and pillow, two twin sheets, a blanket under same, and any reasonable number over, with a quilt, a wooden chair, and a chamber utensil.

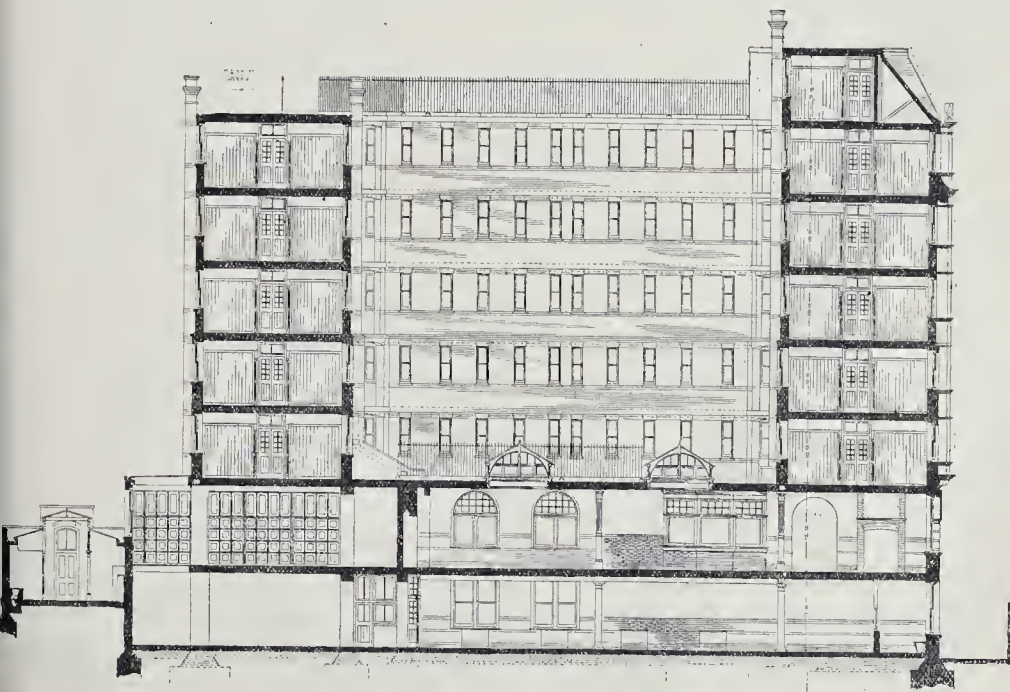
A lodger can go to bed at any time after seven o'clock by presenting his ticket to an official at the foot of one of the staircases. One staircase only is generally used, and found sufficient. He then finds on each floor direction-board giving the numbers of cubicles on that floor. Wrought-iron gates bar access to the cubicles during the day, and at night, except by passing an official, these gates are secured by a weak chain and padlock, which the weight of one man will easily break. It is found to answer its purpose as a moral barrier, and if weakness removes possible danger in case of fire. No lodger is allowed to remain in cubicle after nine o'clock in the morning, at which hour the bedmakers take possession of the various floors.

Section 3.—Catering Department.—The whole of this department is placed in the basement and is accessible only by way of the tradesmen's entrance, by passing through the office lobby or from the Superintendent's private residence.

The kitchen is built in glazed work from floor to ceiling, and has a wood block floor excepting where cooking apparatus is fixed, where red adamantine tiling is laid. In addition to a large range, steam and gas-cooking



The Rowton House, Newington Butts. Ground Plan (no Scale).



Scale of  Feet

The Rowton House, Newington Butts. Cross Section.

apparatus is provided; a kitchen store is provided for cooks' use and dwarf cupboards and dresser. Adjoining is the scullery, built in glazed work, with cement floor, fitted with large white glazed fireclay and teak sinks with draining-boards and a large range of plate-racks. A lift from here opens into the lodgers' crockery store above and another into the shop. The larder, the walls of which are tiled, is disconnected from the kitchen by a service passage (in which is placed the lift for kitchen and larder service to shop), slats and other shelving is fitted up in same. A staircase from shop, constructed in teak, gives access to service lobby and also to the corridor to stores and female staff-rooms. A store is provided for storage of spare crockery.

The large store-room, adjoining this corridor, is for groceries and provisions generally; it is fitted with flour, sugar and other bins, and shelving. The linen and blanket store has the hot-water cylinders therein, as previously mentioned, and is fitted from floor to ceiling with racks for storage; in the passage portion of the store a bench extends in front of windows for the purpose of sorting linen, &c., this is then despatched by lift in corridor to the upper floors. Kitchen coals, meter-room, and water-closet for catering staff is provided. The staff sleeps on the premises, under the reading-room, and has a sitting-room and five bedrooms; the walls of these are plastered, papered, and furnished with pictures, and the floors are wood block. A private door at basement level enables the Superintendent's wife to obtain access for supervision.

Section 4.—Bedmakers.—The bedmakers are not resident upon the premises; they enter the building by the door at side of office and descend to their room, in basement, by a staircase in full view of the office; this staircase is carried up as previously mentioned to the first floor of cubicles. A room known as the bedmakers' room is provided at the foot of stairs, fitted with a small range for preparation of their meals, tables and chairs. Adjoining this room is a cloakroom, fitted with sink, and a water-closet opening out of same; a door gives access to the soiled linen-room, which is built in glazed brickwork from floor to ceiling and has a cement floor. The lift delivers from all cubicle floors into here, and the dirty linen is checked into baskets and taken direct away to laundry.

Having given you a somewhat detailed description of what I have termed an ideal site I now propose, I trust without wearying you, to describe in a general manner the three other houses, of which drawings are before you. Taking them in their order of erection, you will thus the better judge where experience has dictated alterations of the general scheme.

King's Cross House.

This is erected upon a site which presented a good many problems in planning. You will note that it has quite a fair share of troublesome angles, added to which the paving around has a rise of 8 ft. from the entrance to the staircase end of the frontage in Calthorpe-street. In consequence, the basement floor is at a level varying from 8 ft. to 16 ft. below paving. Despite this, I can assure you the setting-back of frontage in Calthorpe-street 8 ft., and the facing of the heavy retaining wall with white glazed bricks, coupled with the use of ivory glazed work in the basement, has secured an amount of good lighting which, from a casual view of the plan, one would hardly expect.

There is a frontage of 200 ft. to Calthorpe-street and 125 ft. to King's Cross-road, with a superficial area of 17,180 ft. A portion of the foundation work was troublesome, although interesting, as on the west side (the left hand boundary) the old Fleet ditch followed the line of boundary. This necessitated the removal of a large quantity of particularly offensive mud and the filling up with concrete and carrying a thick slab some distance from the ditch on to firmer soil, as a very heavy weight consequent upon the staircase comes at this part.

Generally the construction and materials throughout are as at Newington.

You will observe the arrangement of Superintendent's residence, office, and entrance are planned in the same relationship, and also the provision of bedmakers' staircase for access to cubicles and their room in basement. There is also the same complete isolation of lodgers' portion of building from all other parts.

The house has cubicles for 677 lodgers.

The smoking-room has seating accommodation at tables for 128 men; the floor area is 1,600 ft. The crockery store is somewhat on the small side, and more provision is made in other houses.

The dining-room has seating accommodation at tables for 376 men, the floor area is 4,000 ft.; this room was planned in my first scheme of an L-shape, but it was decided that it would prove advantageous to increase the accommodation for lodgers who dined in the building and also to make special provision for those who wished to prepare their own food. The smaller section of dining-room was added, and the lodgers' scullery, with the result that this room is more generally used by those who prepare their own food. The lockers which had previously been planned here were placed in basement, the site being too small to permit of the retention on ground-floor. The reading-room has seating accommodation for 112 men at tables; the floor area is 1,528 ft.

As some of the tables in these day-rooms have seats on one side only, it is quite possible by the use of a few chairs in each room to seat every lodger at a table, independent of the usual seating around fireplaces.

Basement.—The lavatory has eighty basins; this is rather excessive, and in the other houses that number is found to be sufficient for 800 men; a basin of one basin for ten men is ample. The baths, feet-washing and lodgers' wash-house are on lines similar to Newington. Water-closets are provided for day use in proportion of 1 in 20; there are too many urinals.

The catering section and accommodation is proportionate to Newington. The vaults on site existed, and are used for coals, crockery, and meter-room.

Cubicles.—In general planning, sizes, and construction these are as Newington, with the exception that the staircases are not quite so ample, and but one water-closet for night use is placed on each of the various floors. Railed communication across the roofs is provided.

Hammersmith.

This building is erected upon a site within 200 yards of Hammersmith-broadway. The site consists of two parallelograms, the smaller of which forms the frontage to Hammersmith-road, the frontage to which is 65 ft. by a depth of 102 ft. to its junction with the larger, which has a width of 160 ft. by a greatest depth of 276 ft.; the total superficial area is 44,000 ft.

The site is one which is but seldom to be found in the London district, and, despite the small frontage, is one that lent itself admirably to the purpose of my building. The space was sufficient to permit the erection of a building upon the back portion, reserving large areas for light and air, while utilising a portion of the frontage for business premises with a reserved entrance to Rowton House. The site had been originally occupied by an old house known as Oak House and the land at rear was garden ground undisturbed; immediately below the surface a beautiful bed of sand and gravel gave a good foundation, and it therefore proved possible to place the whole of the accommodation other than cubicles upon one level, sinking a small basement for furnaces, bedmakers' room, and parcels-room only. To the west was vacant land, now covered with low buildings belonging to the Road Car Company, which secures good lighting in that direction, in addition to that on site of buildings; on the east, at present a passage known as Rose and Crown lane separates that boundary from a row of two-story cottages, while a width of an average of 30 ft. is reserved on site of buildings to protect light in the event of a rebuilding scheme for these cottages.

Materials and construction, excepting in a few minor details, as at Newington. The superintendent's residence is here a three-story building above pavement, the lower story being used for office, and is situated in relation to entrance and access from same as in other houses. The bedmakers use the front main staircase with a separate staircase down to their room; the catering staff enter at side of office and are isolated from the lodgers' section. The ground-floor main corridor has been made 2 ft. wider than Newington.

The smoking-room has seating accommodation for 164 men at tables; the floor area is 2,428 ft., it is top-lighted, in addition to large bay window; the fireplace in bay is covered down at sill level and the window runs over it. The dining-room has seating accommodation for 404 men at tables; the floor area is

5,722 ft. The reading-room has seating accommodation for 176 men, and a floor area of 3,128 ft.

The table accommodation in these rooms provides a seat for every lodger, exclusive of easy and other chairs. Lavatories, water-closets, baths, and feet-washing are proportioned as at Newington.

The lockers here are all 3 ft. 1 in. high by 1 ft. 6 in. square, with shelf and space for umbrella; they are placed three in height and may be taken as a new standard of size.

Cubicles.—In consequence of the length of site, it was found possible to throw out an arm from the usual U shape towards the north, with sufficient lighting, east and west, for the cubicles. This gave such increased accommodation on each floor that the building was built to a height one story lower than Newington or King's Cross, and still provides accommodation for 800 men. The lengthening to the north made a third staircase necessary—a staircase which, moreover, is convenient for access to the centre of cubicle floors, and is therefore most generally used.

Whitechapel.

This, the latest of the Rowton Houses, is in course of erection in Fieldgate-street, which runs parallel with Whitechapel-road, and is immediately behind the St. Mary, Whitechapel, station. It has a frontage to Fieldgate-street of 192 ft., and a back frontage of 239 ft., by a depth from front to back of 128 ft., giving a total area of 29,539 ft. While this gives an area somewhat in excess of the Newington site, the departure from the rectangular form, and the decrease in depth, gave me some little difficulty in planning the day rooms and catering, and other portions of the buildings. For cubicle planning the site is good, and permits of the omission of one story as compared with Newington, yet giving an accommodation of over 800 beds. To plan the day rooms on a ground floor with a basement under, would have provided excessive space in basement, and also increased the height above paving of building by a height of about 6 ft. I have therefore planned the entrance on paving level, and placed all the usual ground floor accommodation down on a sub-ground floor, the ceiling of which is 6 ft. 6 in. above paving. The only room displaced by this arrangement is the reading-room, which will be approached from entrance hall by a staircase rising 7 ft. only.

The entrance planning is as in other houses with these differences—the clerk has his bedroom, approached from the office by a staircase over the entrance; the superintendent's residence is two stories in height, and underneath his lower story a third story is obtained, by lowering the floor (in the height of two stories of main building) and forming a basement containing bedmakers' room and porters' room approached by separate staircases; the bedmakers' by the wooden staircase at end of entrance, and the porters' by a staircase from lower ground floor level under staircase to reading-room; parcel-room adjoins porters' room.

The dining-room is chiefly top-lighted, and seats 464 men at tables; the floor area is 5,832 ft. The smoking-room accommodates at tables 112 men and has an area of 1,960 ft. The lockers are of the size mentioned for the Hammersmith House and provision is made for one for each lodger.

Lavatory, bath, feet-washing, and water-closets are practically the same. The staircase up to reading-room gives access to the roofs, over the rooms in central courtyard; these will be railed in as a smoking lounge. The reading-room seats at tables 144 men in addition to easy chairs, &c., and has an area of 2,430 ft. You will note that on the same floor cubicles are planned, the central corridor leading to a staircase at each end. The upper floors of cubicles are served by three staircases; that at corner of building 1 anticipates will be the one in general use.

In conclusion, I would lay some stress upon one or two points. In obtaining a site it is doubtful whether one which permits of less than 400 beds is worth entertaining, as expenses all round are proportionately heavier than on a larger site. The site must be within walking distance of the heart of London, as many lodgers obtain casual employment only, and often at late hours. Do not have too many rules and regulations for the lodger. They are not necessary. I have copies of those in use at the Rowton Houses, and as you will see, most of them are directions rather than rules.

You may take it that the men know they have got a good thing, and that for another lodger to treat it otherwise is to call into existence a broad hint that police are not required to maintain order in that house.

The Chairman, in inviting discussion, said that they all felt that Mr. Measures, who seemed to have a monopoly of this class of building, was a master of his subject, and his comprehensive and exhaustive paper gave many interesting particulars. He might remark that he had received a letter from M. Chas. Lucas, asking for a copy of Mr. Measures' paper, in which M. Lucas said that there was nothing in Paris like Rowton Houses, and he would like some information on the subject. The occupation of the residents of these buildings had, he believed, been studied, and it was gratifying to know that there was not an architect or surveyor making use of the buildings, although nearly every other profession seemed to be represented. There were some very important questions connected with the movement for the provision of such buildings; one was, what effect an increase of this work would have on pauperism in London?—whether it really increased or diminished it? That was a most interesting social problem, and it rather seemed to him that such accommodation must have the effect of bringing to London from the provinces a class of casual workers who, when too old to earn even the small pittance that enables them to make use of these dwellings, would be driven into the workhouses, and in that way help to increase the burden of taxation. He would like to ask Mr. Measures whether intoxicating liquors were sold in these buildings.

Mr. Thomas Blashill, in proposing a hearty vote of thanks to the lecturer, said he had visited the Glasgow lodging-houses, which were pioneer buildings of this kind, and although they did a very useful work, still they were in many ways inferior to the Rowton Houses. He had been very much struck with the extremely good way in which everything was done in Rowton Houses—not only as to construction, but also as to finish; the amount of glazed work and good hard wood, for instance, that was used, gave quite a sumptuous appearance to the buildings. He would like to ask Mr. Measures how they managed to get such good work done at these buildings at a price which apparently recouped the investors, even though no more than sixpence per night was charged per head for accommodation. The London County Council built one of these lodging-houses as a kind of experiment at the time when there were none of these Rowton Houses, and the question they had to deal with was, What kind of building would be suitable? The result of a competition (which Messrs. Gibson & Russell won) was the Parker-street dwellings, Drury-lane—a building entirely different in style from the Rowton Houses. The basis of the idea for that building seemed to have been taken from a Sailors' Home in Wells-street, in which the idea seemed to be to provide something like the hull of a ship for the hall, with two or three galleries—the cubicles opening from the galleries. In the Parker-street buildings there were none of the luxuries which were provided at the Rowton Houses, except that some one provided books for the use of the lodgers. It was very good of Mr. Measures to give them so much valuable detail in regard to these buildings, for detail in such cases was of very great importance. He had heard a slight objection to these buildings on the part of a lodger who used the ordinary kind of lodging-house, viz., that there was an absence of the homeliness which he had been accustomed to. In regard to the remarks made as to the need of these buildings for architects, he might say that he had been much struck by the air of comfort in these buildings, and that there appeared to be nearly everything one wanted—perhaps, though, the cubicles would be a little efficient. He had met several gentlemen from various parts of Europe who had referred to the need in their towns of buildings of this kind and of the difficulty of lodging single men personally, he thought that provision of buildings of this kind was likely to be increased to a very great extent, for it seemed to be one way of solving the housing problem.

Mr. A. T. Bolton, in seconding the vote of thanks, said he had seen two of these buildings, and he could bear testimony to the great attention to detail that had been given by Mr. Measures in solving the problem of providing accommodation for single workers. One point

which had not been referred to by the lecturer had, he understood, been of extreme importance, and that was the width overall of the building, which was only 10 ft. A point which struck one in visiting these buildings was the central corridor, which looked narrow, in spite of the fact that the cubicles did not reach to the ceiling. If the corridors could have been 4 ft. 6 in. or a little more it would, he thought, be better, seeing what a length the corridor had. As to the architectural aspect of these buildings, he felt that they afforded a curious instance of how several structures of the same kind might lead to an advance in the treatment of a particular class of buildings. The last Rowton House, at Hammersmith, and the one at Newington were very much more interesting than the previous ones. The back of the Newington building had, in his opinion, an expression of its own with its enormous extent of blank wall of great height and all those uniform windows. It conveyed an idea of a building of a special character and purpose, and he wished that Mr. Measures had had the courage to treat the front in the same way, though no doubt the architect had felt he must make a concession to the man in the street by breaking up the façade and having some gables. As to Mr. Blashill's point about the finish of the buildings and the character of the work, that was probably due to some extent to the fact that the Rowton Houses Company were their own builders, and would, in order to save in natural repairs, secure the best materials possible. He thought the Association should try to arrange a visit to one of these buildings, because there were many points of interest which could be better understood by a personal visit than by a description.

Mr. C. H. Brodie asked if any progress had been made in the matter of providing similar houses for women.

Mr. H. V. Lancaster, in supporting the vote of thanks, asked if it had been found necessary to provide any artificial form of ventilation for the large dayrooms and dining-rooms?

Mr. Blashill said he should like to add a few words. There was a lodging-house for women in Glasgow, but he did not know whether the organisers of it had experienced any difficulty as to its working. People in London who had considered the subject had felt that there were difficulties in regard to the admission of women to such buildings. In a large provincial town where a house for women was run by the Wesleyan Connexion he put the difficulty before those connected with the lodging-house, and asked whether they were able to keep clear of objectionable characters. "Oh, no," he was told; "they are the very people we want to catch." That indicated that the scheme was rather charitable and philanthropic; what was wanted was a scheme run on municipal lines. He was told that the County Council intended to build such a house.

The Chairman said it had often occurred to him that something on the line of Rowton Houses, but with separate bedrooms, not cubicles, might be done for poor clerks and young fellows who were not able to earn more than 15s. to 17. a week. There were a large number of young and respectable men in London to whom a scheme of that kind would be a great boon. He did not know whether Sir Richard Farrant or any one else could do something for such young fellows. [Mr. Brodie: One exists already near St. Pancras Station.] The Chairman: Oh, yes, Hampden House; but that is not quite the sort of thing I mean, nor is the neighbourhood quite desirable. He would like to ask why cards were excluded from the houses, and he would like to know what, in Mr. Measures' experience, was the comparative wear of oak blocks and deal blocks. He would also like to know what the minimum cost of living was in these buildings, and if social entertainments were got up for the inmates? He understood that the houses were not classed under the Registered Lodging House Act [Mr. Measures: That is so.], and he did not quite recollect the reason for the decision of the Courts. In a somewhat similar building he had used Dashwood's terracotta partitions between the beds, and, as far as he could gather, the material had proved very satisfactory. It was absolutely vermin-excluding, and was strong and inexpensive. With the vote of thanks to Mr. Measures he was sure they would desire to associate the names of Lord Rowton and Sir Richard Farrant for allowing so much information to be made public.

The vote of thanks having been put to the meeting and heartily agreed to.

Mr. Measures, in reply, said as to the class of tenants using the buildings, there were men of every class, from the man in corduroys to the one in frock coat and silk hat; so far as it was possible to judge, the latter had to practice more economies than the former in the matter of living, despite the small outlay for accommodation, a fact which pointed to a greater wage earning difficulty. Intoxicants were not permitted on the premises because it would never do to run the risk of having drunken men in their houses. Cards and gambling went together, and they could not be permitted. As to the wear of oak blocks, he did not think they had to renew any of the oak blocks yet. Social entertainment was not provided, apart from facilities for reading, chess, draughts, &c., though at Newington at Christmas the lodgers got up an entertainment among themselves, and some of them showed a surprising amount of talent. As to the cost of living in addition to the cost of bed, a lodger could actually live in one of those buildings for between sixpence and sevenpence a day, but for a shilling a day he could be said to live in luxury. As to the dwellings being registered under the Common Lodging Act, he was not able to say much about that; but as a stigma was undoubtedly attached to a common lodging-house, it was very much desired by Lord Rowton to avoid that; and though the London County Council had said the buildings were common lodging-houses, the law had taken a different view. The expression, "a poor man's hotel," was the best designation for the places. As to the good work shown in the construction of these houses, the company were their own contractors and there was no inducement to scamp work. He could honestly say that everybody connected with Rowton Houses, from Lord Rowton down to those who had charge of the works, was keenly interested in the work, and that interest showed in the work that was done. As to the width of the cubicle floors, 10 ft. was the standard size from wall to wall inside. Every cubicle partition and sash was the same from bottom to top of building; and in repetitions like that there were bound to be some economies. If cubicle corridors were made 4 ft. 6 in., the extra width would be taken out of the sleeping apartments, and that, he thought, would not be at all desirable. As to houses for women, there was a good deal of talk about provision of that kind, and he would like to try the experiment of providing a building. Women required more room than men in their sleeping apartments, and more room meant more cost. The women could not be turned into the basement to wash, and that meant the provision of washing conveniences in the cubicle blocks, and that again meant more expense. There was a difficulty, too, in dealing with women in their relationship with other women. In a lodging-house for men and women within thirty miles of London, discrimination of class was exercised in the admission of women, with the consequence that the house was a failure on the women's side. As to ventilation, they had no artificial system; they could not afford to spend money in that way, and they relied on the windows. As to a visit of the Association to one of these buildings, he had no doubt that it would be possible to arrange a visit to the Whitechapel building when it was finished, later in the year.

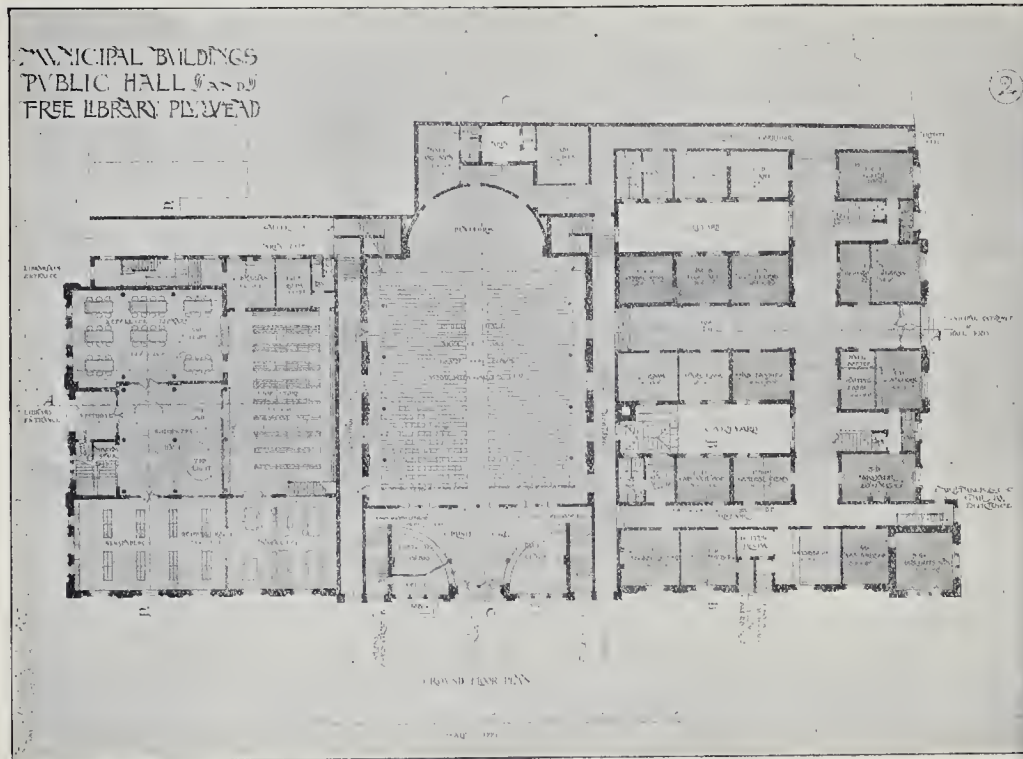
The Chairman announced that the next meeting would be held on the 29th inst., when papers would be read by Mr. H. D. Searles-Wood and Mr. H. R. Appelbee on "Small Suburban Houses," illustrated by lantern slides.

The meeting then terminated.

COMPETITIONS.

COTTAGES, TANFIELD.—The first premiated design in the competition for cottages at Tanfield, Durham, was sent in by Mr. Thos. Robinson, Burnopfield, Durham; and the design placed second was by Mr. G. T. Wilson, Blackhill, Durham.

PROPOSED RESTORATION OF MERCAT CROSS, ST. ANDREWS, FIFESHIRE.—It is proposed to restore the old Mercat Cross at St. Andrews in commemoration of the proclamation of King Edward. Mr. David Henry, F.S.A., of St. Andrews, has been consulted in the matter.



Illustrations.

PRINCIPAL ENTRANCE TO NEW SCOTLAND YARD.

ILLUSTRATION of a portion of Mr. Norman Shaw's celebrated building is reproduced from a very well executed tinted elevation by Mr. Harry Jones.

There have been many views of New Scotland Yard published, but a measured drawing of a part of the structure in detail is rather a novelty, and may be an interesting possession to some of our readers.

SOME RECENT DESIGNS FOR PIANOFORTES.

THESE designs are commented on in a critical sense in the second article in the present issue. It is only necessary here to briefly enumerate them.

No. 1 is designed by Mr. A. C. Blomfield, and is executed in Spanish mahogany inlaid with coloured woods; the interior of the lid is similarly inlaid on a ground of satinwood.

No. 2 is an upright grand designed by Mr. Gilbert Ogilvey; the case is of oak, with inlay decorations of black oak, pearl shell, ivory, and satin-wood, on a ground of richly coloured pollard oak.

No. 3 is a drawing-room grand designed by Mr. E. L. Lutyens, in an oak case with wrought steel pedal work and music desk.

No. 4 is a semi-grand designed by Mr. C. C. Allom, decorated with engraved inlay of coloured woods. The internal metal work is silvered and lacquered.

All the instruments illustrated were made by Messrs. Broadwood. No. 3 was exhibited in the English Royal Pavilion at the Paris Exhibition.

DESIGN FOR MUNICIPAL BUILDINGS FOR PLUMSTEAD.

THIS was a competition design submitted by Messrs. Russell, Malloes, and Grocock, the perspective view of which was exhibited in last year's Royal Academy. We append a

plan of the ground floor of the building as proposed.

It was intended that the walls generally should be carried up in stocks from the Sittingbourne district; the exterior elevations to be faced with red bricks and Portland stone dressings, and the internal courts on the ground floor faced with white glazed bricks.

The estimated cost, at the rate of 10d. per cubic ft., was 41,500l.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

By the invitation of Messrs. Broadwood the Architectural Association were enabled, on Saturday, the 9th inst., to view an interesting collection of pianos, comprising specimens of the earliest types down to those of the most recent construction and design. Mr. Rose, in a short speech, summarised the history and evolution of the instrument from its constructional aspect, and a tour through the showrooms showed examples of nearly every style of decoration since its invention. Of the earlier types perhaps the Sheraton and Chippendale appealed most to the members, by reason of their simplicity and dignity, though the inlaid work and carving of all was both chaste in design and admirably executed. Of the modern examples, the drawing-room grand, designed by Mr. Lutyens, which won the Grand Prix at the Paris Exhibition, claimed first attention. Jacobean in design and executed in dark oak with steel fittings, it was full of interest and quiet dignity, and was a standing argument in favour of the retention of the constructional form of the instrument in the treatment of its shell. The richly panelled casing was carried by about twenty legs, grouped at different points of support and connected at their feet with curved stiffening pieces; but, in spite of their number and disposition, one could not help being struck by the extreme slenderness of their proportions compared with the weight they had to carry; and the consequent impression of instability was not entirely dispelled by actual experiment. Of the upright grands one of the most pleasing was designed by Mr. Ogilvey, in oak inlaid

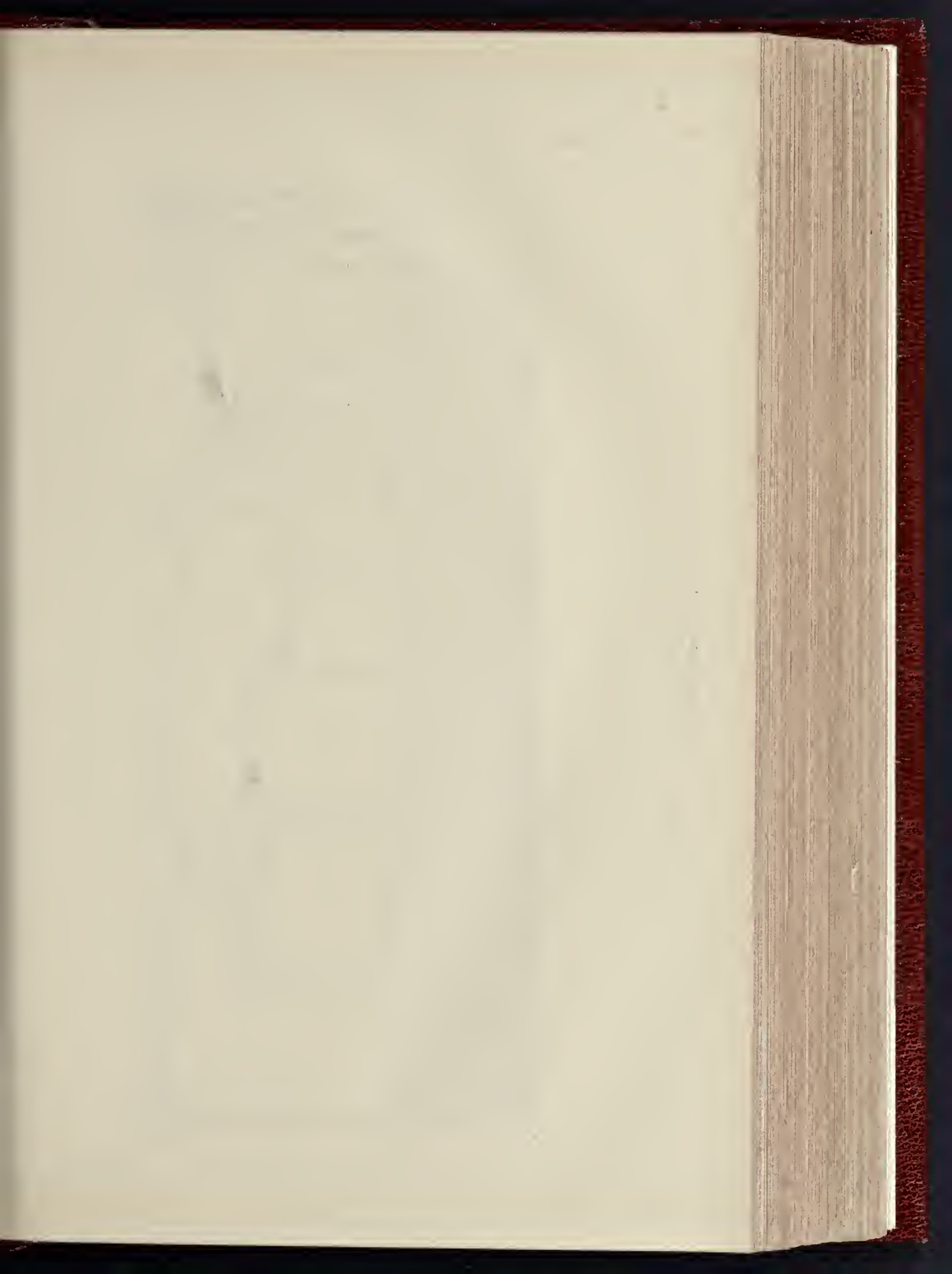
with pearl and coloured woods with polished iron fittings. To the same class belong three of Mr. Baillie Scott's—two in fumigated oak with copper fittings, and one in green-stained oak with steel fittings.

All these pianos when shut resemble a cabinet, and there is no visible indication that they are anything else. Perhaps the structural shape of an upright piano does not commend itself to modern design—though one wonders that they all seemed to strike one at first sight with a sense of "something that is gone." The same thought is suggested by the rather unusual octagonal and square shapes of the most recent designs; a sense of injustice, as it were, on the part of the body to the soul of the instrument. It may be that this objection is purely sentimental, the outcome of obsolete associations and meaningless traditions. Mr. Rose explained that a piano can be made to *any* given shape, but as the "harp" form apparently remains constant, we must presume that this would be effected by a process of "padding" in the frame. A vote of thanks was passed by the members for a very interesting visit.

The third spring visit took place on March 16 to Stanhope House. Judging from the outside, it would appear at the first glance that the sentiments which inspired the Gothic revival of the sixties and seventies is still extant. As a distinct contrast from what we now look upon as being an orthodox treatment of a modern exterior, Mr. Romaine Walker's effort in Park-lane suggests that "Mediævalism" has been a conditional factor of the design.

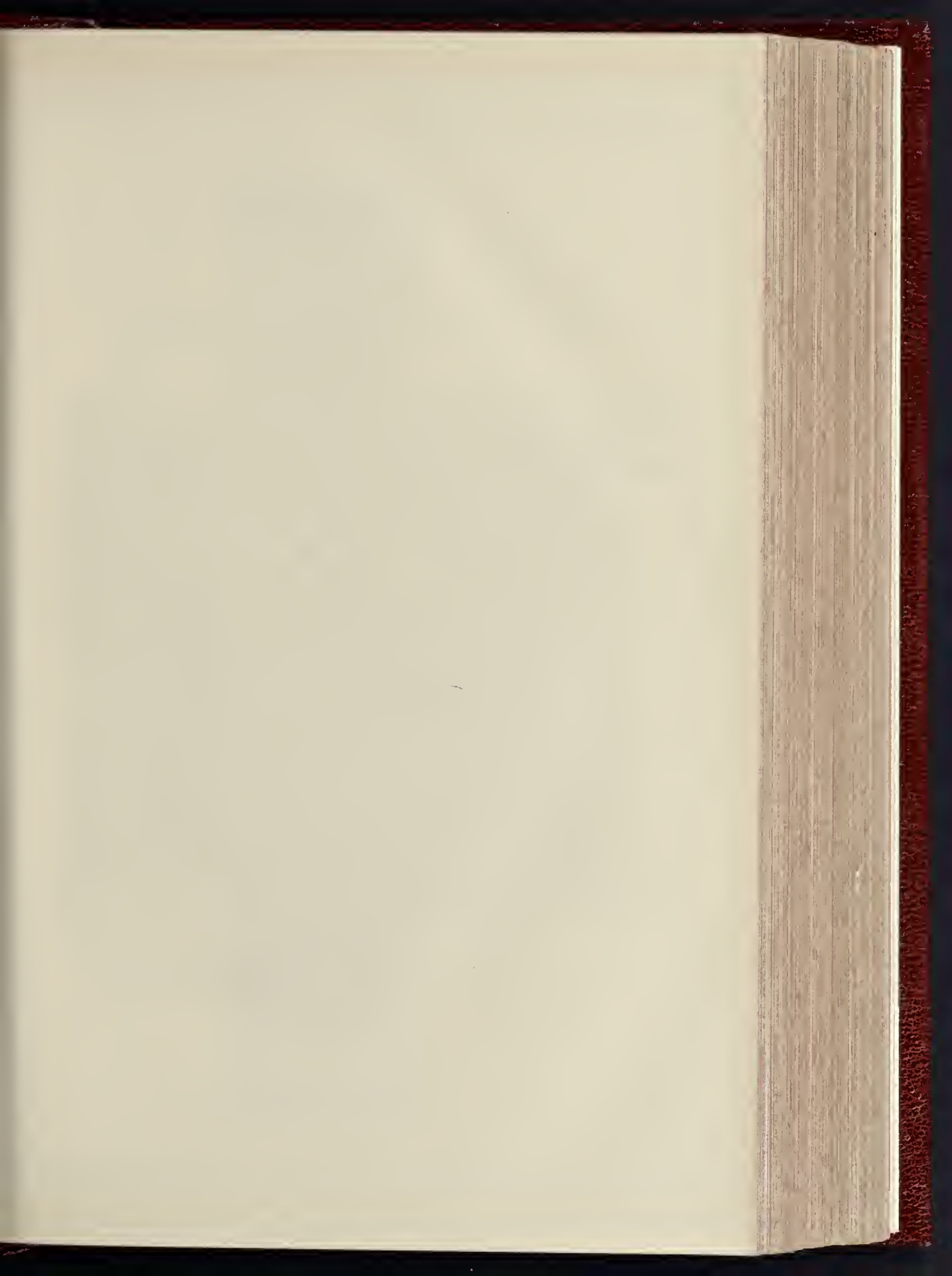
The grey Forest of Dean stone in which the elevations are entirely worked is a study in effect compared with the surrounding buildings. The colour is a variety; there is a lack of life in this stone which, to our minds, does not lend itself to elaborate dressings. There may be the corresponding advantage of durability which justified its use.

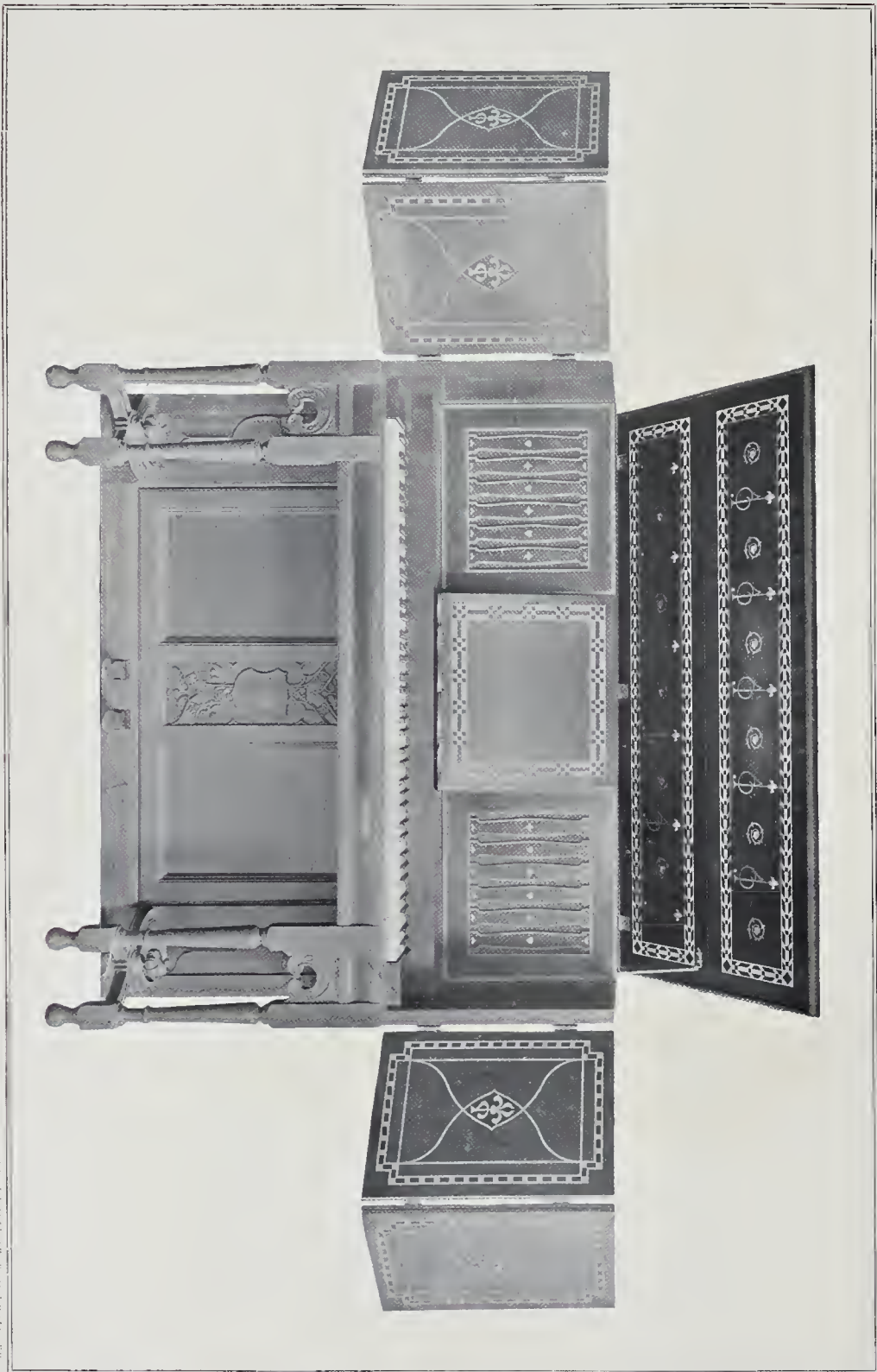
The house, which occupies a confined corner-site, is planned to meet the usual requirements and great skill has been shown by the architect.



THE BUILDER, MARCH 23, 1901.





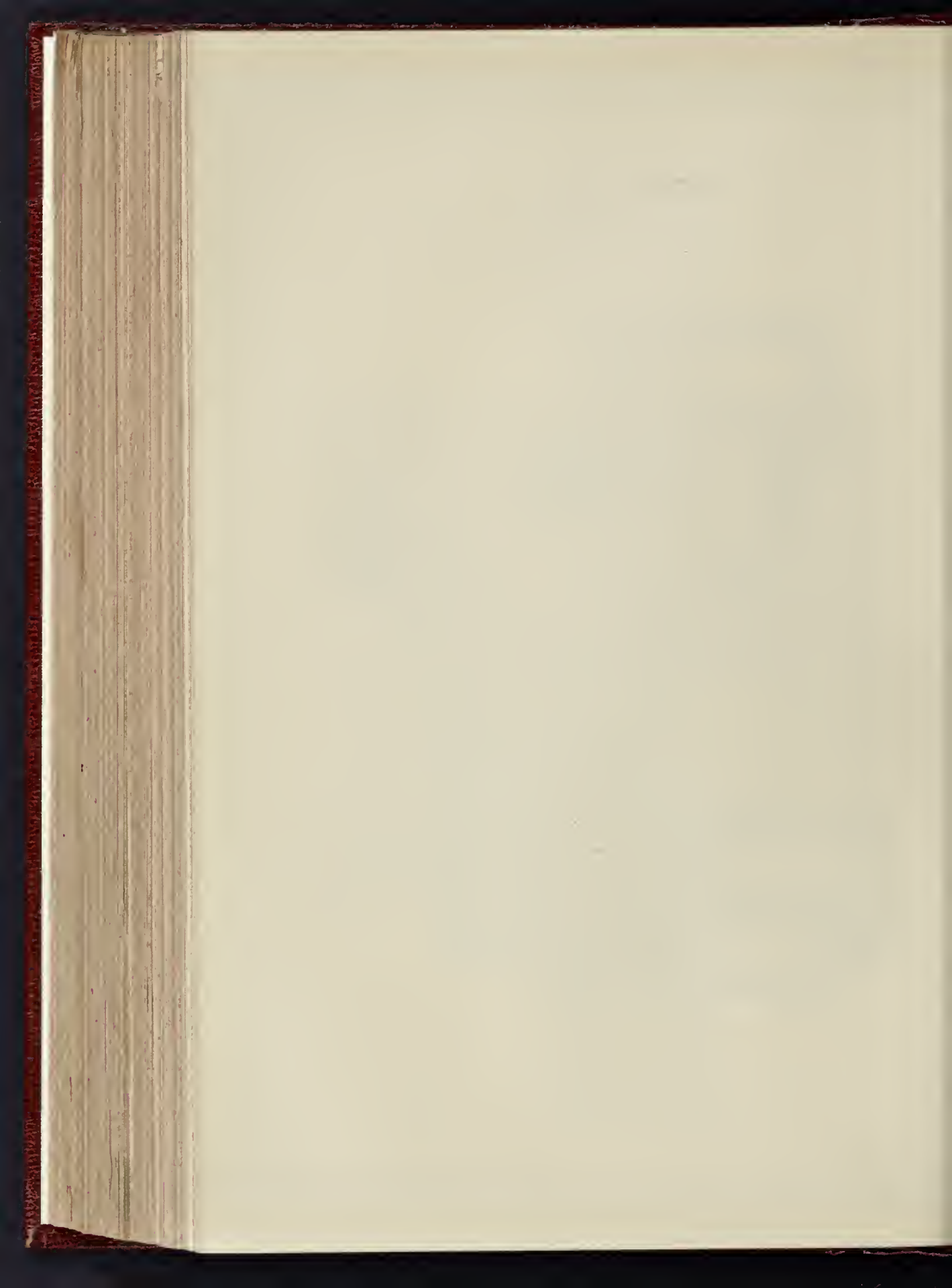


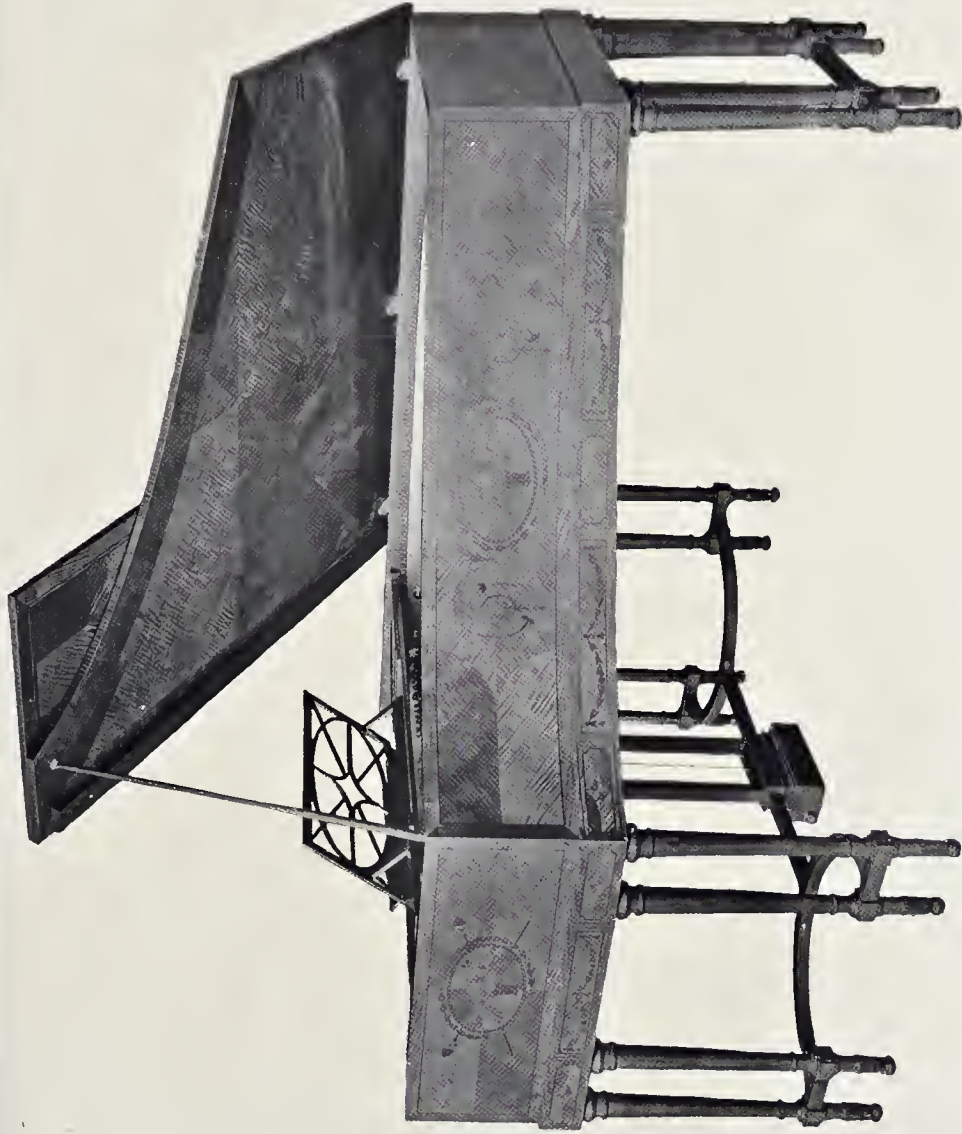
SOME RECENT DESIGNS FOR PIANOFORTES
No. 2.—UPRIGHT GRAND: DESIGNED BY MR. G. OGDEN.

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THE BUILDER, MARCH 23, 1901.





Sprague & Co., Ltd., 4 & 5 Essex Buildings St., Fetter Lane, E.C.

SOME RECENT DESIGNS FOR PIANOFORTES.

No. 4.—SEMI-GRAND PIANOFORTE: DESIGNED BY MR. CHAS. C. ALLOW.

in overcoming the intricate problems of the lighting of the staircases and the lifts.

Generally speaking, the interior is a contradiction to the outside, and with the exception of the vestibule, dining-room, and library, an "Adam" treatment predominates. The vestibule is successfully panelled and carved, following out the traditions of the exterior.

The staircase and hall, in white marble plaster modelling and a polished steel balustrade, conveys to the visitor an entirely satisfactory treatment, and it is well carried out.

The drawing-room, which occupies the whole of the front of the first floor, also suggests the Adam period. The wall surfaces generally, also a low dado, are covered with a monotone green hanging. We think an improved effect could have been obtained in this room if the ceiling decoration could have been brought more into sympathy with the three bays.

Looking towards the windows, a curtain arch, without which the Gothic element is incomplete, should have been adopted, or the ceiling should have been carried up to the stonework of the windows. This has been done on the second and third floor levels with good results.

The second and third floor levels are similar and contain comfortable suites of bedrooms with bathroom on each floor. The tiling of the bathrooms is excellent, both as regards the design of the tiles and the texture of the material, and it is seldom that tiling is seen to such advantage.

The basement is mainly in glazed brickwork, and the fittings of the various departments are teak. The kitchen is in Dutch tiles, with teak fittings, and the glazing is in lead lights.

Mr. Romaine-Walker attended the visit, and kindly explained to the members present the working of the design.

ARCHÆOLOGICAL SOCIETIES.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.—An evening meeting of this Society was held at the London Institution, Finsbury Circus, on Monday, 11th inst., when Canon Benham occupied the chair. Mr. T. W. Shore read a paper entitled "Anglo-Saxon London and its Neighbourhood," a continuation of a former paper which he had read, showing the importance of the City in Saxon times. The next paper was written by Mr. John Terry, the City Clerk of the Works, "On a Recently Discovered Portion of the Roman Wall," but, owing to the unavoidable absence of Mr. Terry, the paper was read by Mr. Charles Welch, hon. sec. The portion of the Roman wall spoken of was recently discovered at No. 8, Old Bailey, adjoining the Sessions House, but before describing it the paper gave a short account of the wall from the time of its erection *circa* A.D. 306. It ran from the river to Ludgate, then to Newgate, and on to a point between St. Bartholomew's and Christ's Hospital, and so on to Aldersgate, Cripplegate, and Bishopsgate, whence it was carried south to near where the White Tower now stands. The portion now discovered at the Old Bailey was about 8 ft. high and 8 ft. 3 in. thick above the foundation, which was 14 in. wider. From the base of the foundation there was 3 ft. 6 in. of rubble work of large ragstone. Then came three courses of tiles, and then 2 ft. 7 in. of smaller ragstone and two courses of tiles, on the top of which was other rubble work. The interior of the wall was ragstone, roughly thrown in, and grouted with lime mortar of excellent quality, the whole forming a hard concrete mass. The inner face, where not mutilated, was in a good state of preservation, but the outer face showed the effects of the water of the old Fleet Ditch. Mr. Terry next mentioned the spots where portions of the wall had been discovered at different times: that at Bishopsgate, 1707; the Minories in 1811; Playhouse Yard, Blackfriars, 1843; and others at Fish-street-hill, and Broken Wharf to Lambeth-hill. He had also written another paper on the bastion at Cripplegate. When the Corporation refused to repair this bastion, he personally superintended the work. It was a piece of the wall which had many times undergone repair, chiefly of an injudicious character. Originally the face of the wall was of ragstone, but at one time or other a mixture succeeded it, and now ragstone had been reintroduced to harmonise with the remainder. In getting out the decayed portions of the wall a mis-

cellaneous collection of broken stones was brought to light, together with a portion of the head of a Gothic window and several pieces of gravestones. At the time when the recent repairs were being done it was thought advisable to inspect the wall below the ground level, and excavations were made to a depth of 18 ft. The lower portion of the wall to the height of about 4 ft. was in excellent condition, and judging by the materials, was of Roman origin. Above this height the wall was of a different character, several kinds of stone being used, intermixed with Roman tiles and flints in occasional layers of oyster shells. The mortar was of an inferior nature to that below. Although Roman materials were used, there was not the slightest sign of the work being Roman. The many repairs this bastion had received were due in a great measure to the fact of its being placed at an angle of the wall, and consequently being a chief point in assault. Mr. Terry next referred to the discovery of a red brick tunnel or drain, an illustration of which was shown to the meeting. This, he said, was built in Roman cement and was splendidly constructed. It varied from a height of 4 ft. 6 in., and was 2 ft. 6 in. wide. At intervals chambers of a height of 12 ft. to 14 ft., covered over with large flat stones, were attached. The tunnel was investigated to a distance of about 200 ft., and then it was found to be broken up for the purpose of houses being built above it. It was also found that it had several branch drains. The main portion followed the line of the old City, in what must have been a ditch. He thought it was constructed for the purposes of a drain, for the floor was circular in formation. It was probably built in 1648 to take the water of the ditch. Had it been built for another purpose, the floor would have been flat. In Harrison's "Notes of London Churches," the following description appears to identify this culvert, and to supply some explanation of its present position:—

"Moredich, from Bishopsgate to Moregate, was arched over with a great number of brickworks, and then filled up, and made plaine ground over it in the year 1638 and soe left. But the rest of the ditch from Moregate to Cripplegate was arched over as the other in 1648, and left by the City at great rates but long leases of the ground, and one condition that they shall build such houses as they appointed them and in such a time. There are many faire houses built their already, this year 1658."

Mr. George Potter exhibited some excellent illustrations of the old Roman Wall from the earliest period to latter-day discoveries.

ARCHITECTURAL SOCIETIES.

BRISTOL SOCIETY OF ARCHITECTS.—The ordinary monthly meeting was held at the Fine Arts Academy, Queen's-road, Clifton, on Monday evening last, Mr. W. L. Bernard, F.R.I.B.A., in the absence of the President, in the chair. After the routine business, Mr. Archibald Dawnay, Assoc. Mem. Inst. C. E., read a paper on "Constructional Steelwork as applied to Building." The paper dealt very fully with the origin and development of cast iron construction in the early part of the last century, and thence onward to the rolled wrought ironwork and more recent steel construction of the present day. The lecture was illustrated by a very admirable series of full-sized drawings of the different forms of stanchions, girders, &c., employed in large buildings.

DUNDEE INSTITUTE OF ARCHITECTURE.—A lecture to the student section of the Dundee Institute of Architecture, on the "Ecclesiastical Architectural Antiquities in Fife," was delivered in the Technical Institute on the 9th inst. by Mr. Charles G. Soutar. After briefly tracing the influences which affected ecclesiastical art in Scotland generally, from the time the Irish influence was superseded by that of Rome, through the various stages of the Gothic art, he took up severally the principal examples of structures showing these influences found in Fife, amongst which were the following in the order of their foundation:—The Monasteries in St. Andrews, Church of St. Regulus, Cathedral of St. Andrews, Balmerino Abbey, Abdie Church, Newburgh, Leuchars Church, St. Monance Church, Crail Church, Cupar Church, St. Salvador's or College Church, St. Andrews, and Dairsie Church. These were treated both from an historical and architectural point of view, and were illustrated by numerous lantern slides and drawings.—*Dundee Advertiser.*

SANITARY INSPECTORS' ASSOCIATION:

ANNUAL DINNER.

THE eighteenth annual dinner of the Sanitary Inspectors' Association was held on Friday evening last week at the Royal Venetian Chamber, Holborn Restaurant. Archdeacon Sinclair presided, and among those present were the Rev. C. W. Whitfield, M.A., the Master of the Carpenters' Company, Mr. W. H. Dickinson, L.C.C., Dr. G. Groves, D.P.H., Dr. F. G. Allan, D.P.H., Dr. Howard, the Mayor of Deptford, St. Pancras, Finsbury, and Poplar, Alderman Redfern (Stockport), Councillor Wilson (Bury), Mr. W. H. Grigg (Chairman of Council), Messrs. E. Gibbs, C. Gordon, A. Richardson, H. Lovegrove, E. Lewis Thomas, T. Cato Worlford, A. Mills, T. Ashdown, T. G. Dee, E. Tidman, and J. Young.

After the toast to the King, the Mayor of St. Pancras proposed "The Houses of Parliament," which was responded to by Alderman Redfern.

"The Defenders of the Empire" was then submitted by the Mayor of Finsbury.

Dr. Groves, in reply, said a corps of medical officers and sanitary inspectors should have been sent to South Africa. He could not conceive of anything more scandalous than the number of deaths from enteric fever during this war.

Dr. Howard, who had served in the Crimea, also responded, remarking that the mistakes of the past would teach us to be fully prepared in the future.

Dr. Groves, in proposing "Local Government," referred to the question of the security to the sanitary inspectors of the tenure of their office. It was unfair to appoint a sanitary inspector for twelve months, or for two or three years, so that he could be dropped at the end of that period. This was frequently done outside London, especially in the rural districts. If a sanitary inspector appointed under these circumstances became a bad friend to owners of property who were members of the Local Authority he was bound to be dropped at the end of his term, and an inspector dropped in that way did not get another appointment.

Alderman Dickinson, L.C.C., in response, likened local government to a locomotive, the three principal factors of which were the machinery (the officials), the driver (the members of the Authorities), and the motive force (the electors). He said he was glad to find that Local Authorities now insisted upon having skilled men as sanitary inspectors, because their work was very trying and responsible. The Authorities themselves had undergone a great process of improvement, and if they had carried out their duties twenty or thirty years ago as well as they did now we should not have had the terrible state of overcrowding which existed now.

Alderman Redfern and Councillor Wilson also responded.

Archdeacon Sinclair submitted "The Sanitary Inspectors' Association." He said the Association had fully justified its existence by the many things it had already achieved. Their general objects were very praiseworthy. They met together to discuss and to receive instruction in regard to the various sanitary Acts of Parliament, and such subjects had been dealt with as the source of the water supply of London, the smoke nuisance, and the inspection of lodging houses. One important object they had was a general promotion of sanitary science; and another was to purchase property—and he hoped they would become wealthy and prosperous—while another was to receive gifts. During the past year they had held an exhibition at Lincoln, which had been very successful. The Association had already 600 members, and he learned from the Secretary that this number was monthly increasing. There was no question that the duties of the sanitary inspector were very trying, as they had a large amount of prejudice, stupidity, and superstition to contend with. He trusted that their tenure of office would soon be amply secured. In conclusion, he wished it had been the duty of the sanitary inspectors to see to the ventilation of our churches and public buildings. Acting for the Bishop of London he had inspected churches before they were consecrated, and he rarely found that sufficient attention had been paid to ventilation. Perhaps this was one of the two reasons why people went to sleep in church. He then presented the medals and certificates earned in connexion with the Lincoln Exhibition. A silver medal was

awarded to Messrs. Oates & Green, of Halifax; a bronze medal to Messrs. Guest & Chrimes, and one to Messrs. Wilson & Stockdale. Certificates were awarded to Mr. Charles Duckering, Messrs. Arnold & Co., Mr. E. F. Nurdock, and Messrs. F. Lockerbie & Wilkinson.

Mr. W. H. Grigg, in responding to the toast, said he was glad to know that the medical officers were doing all in their power to assist sanitary inspectors in regard to their tenure of office. They had included this in their Bill, and he thought it would be advisable for the inspectors to drop their Bill and press forward that prepared by the medical officers.

The toasts of "The Chairman" and "The Visitors" concluded the list.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME Counties District Meeting of the members of the Association of Municipal and County Engineers was held at the Council Offices, Wimbledon, on Saturday, March 16. Mr. C. H. Lowe, C.E., Hampstead, President occupied the chair, and there were present Messrs. W. Weaver, Kensington; J. P. Barber, Islington; R. J. Thomas, Aylesbury; W. H. Harpur, Cardiff; J. Parker, Hereford; — Martin, Wandsworth; A. H. Campbell, East Ham; — Cooper, Wimbledon; — Ainsworth, Teddington; — Jenkins, Walton; — Parr, Willesden; — Brookes, &c.

The President, in opening the meeting, informed the members that the Council had taken steps to express the feeling of the members of the Association with respect to the lamented death of her late Majesty Queen Victoria, by conveying a vote of condolence to the King and Royal family in the loss which they and the nation had sustained. As to the orphan fund, he was pleased to say that it had been carried to a successful issue, and the Committee had been enabled to make a grant from the fund, so that it was now in working order.

Mr. Cooper, Engineer to the Urban District Council, then gave a short description of the various public works which had been carried out since the previous visit of the Association in 1898. The railway-station bridge, which was now being demolished, was erected about 1866. It has a clear width between the parapets of 30 ft., the girders from the parapets being 7 ft. 6 in. by 2 ft. continuous, but the flanges were not thickened where the bending moment was greatest. These parapets carried the entire structure; the bottom flanges were covered, being seriously affected by the fumes from locomotives. The bridge now being constructed would be 50 ft. in width between the parapets, the carriage-way being 30 ft. in width, with 10 ft. paths on either side. The carriage-way was carried on eight 1 ft. 6 in. by 2 ft. girders, and each path on three similar girders. The contract for the work was let to Messrs. Firbank at 12,628l. The eastern portion of the bridge had been erected and carried traffic during the demolition of the old bridge. When the Association visited Wimbledon in April, 1898, the buildings forming the depot were in course of erection. They were now completed and occupied, providing stabling for thirty-nine horses, with six isolation loose boxes, store block, and residence for the storekeeper and housekeeper. They had lately acquired an additional acre of land on the east side of Ashcombe-road, which they hoped to connect up by sidings. The seven buildings forming the Isolation Hospital had been in use since September of last year. The administration block was built to accommodate a staff of twenty persons, and the cooking was done there for the other wards. There was a large ward with twenty-two beds, a twelve-bed ward, and two isolation rooms on the Local Government Board type. Then there was a lodge laundry, ambulance, and mortuary. There was only one peculiarity about the scheme, and that was the bringing of the steam from the sewage pumping station, where steam at 50 lb. pressure could be obtained. The steam was conveyed in a 3-in. cast-iron main for a distance of about half a mile, and the loss in pressure was about 5 lb. At present their tank accommodation at the sewage works was less than half a day's dry weather flow. When the proposed new tanks were completed they would have rather more than a day's dry weather flow. The new tanks would consist of four tanks, 110 ft. long by 30 ft. in width. They could be used either

separately or in series. The sludge taken from the tanks would go into a large sludge tank, and it was proposed to raise it by an ejector to the present sludge tank in order to allow of pressing. He proposed trying an experiment, as soon as he got them, by using one as a septic tank, and seeing how they could get on with it. He had lately constructed ten artisans' dwellings. They were let at 7s. 6d. a week each, which just covered the cost, and interest on and repayment of loan in thirty years. He was also preparing plans for other artisans' dwellings, in which he was trying to put in bathrooms. Some of them were in flats, in which there would be bathrooms, but he found it very difficult to introduce bathrooms in the others, without doing away with a bedroom or else materially increasing the rent.

Mr. James said he understood there was more accommodation for women than for men at the isolation hospital, which was very unusual. He would like to know whether that was because the children were treated in the women's wards.

Mr. Ainsworth, Teddington, asked the cost of the artisans' dwellings, and whether the rent of 7s. 6d. covered every expense to the Local Authority.

Mr. Jenkins, Walton, did not consider the provision of a bathroom to be necessary in an artisan's dwelling. It was possible to have a bath in the kitchen or scullery.

Mr. Gladwell asked the cost per head of the isolation hospital, and separately the cost of the land and buildings, as the cost of land varied so much in different districts.

Mr. Harpur, Cardiff, who moved a vote of thanks to Mr. Cooper for his description of the works he was carrying out, said they had not erected any artisans' dwellings in Cardiff up to the present time, but there was a cry for such dwellings. His difficulty was, if he put up any such dwellings, how to do it so as to let them at about 4s. a week. The ordinary speculative builder in Cardiff provided houses in any number which let at 6s. 6d. to 7s. 6d. per week, and if they were to provide any dwellings for the labouring classes they must let at a less rent than that. His own opinion was that the ordinary builder would provide houses there was a demand for, but necessarily he must get a profit upon his outlay. When they as Local Authorities had paid for the upkeep of the building and interest on and repayment of loan, he did not see how they could do better than the ordinary builder. It was a very difficult problem, and one constantly brought to the front, but how it was to be met by Local Authorities who had to repay the principal in thirty years, and still not burden the ratepayers, he did not see.

Mr. J. Parker, Hereford, who seconded, said that most of the municipalities had entirely misunderstood the housing problem. It was not dwellings for artisans they had to build, but for labourers. From the slums they were ousting tenants who were paying 2s., 2s. 6d., or 3s. a week rent. It was quite true they were miserable hovels. He saw no hope of building dwellings which would meet the requirements of the Local Government Board and their own by-laws at such a rent. The lowest they could do was 4s. 6d. per week, and that did not meet the problem for the poorest class of tenants. Mr. Boulnois had come nearest to a solution at Liverpool.

The vote of thanks was accorded with acclamation.

Mr. Cooper, in reply, said the answer respecting the wards at the Isolation Hospital was self-evident, and the gentleman who asked the question answered it himself. It was that the children went into the women's ward. As to cost, the administration block was constructed so as to be sufficient when further pavilions were erected. At present the cost per bed was high, but when the hospital was completed he anticipated that the cost per bed would not amount to 400l. The artisans' dwellings they had erected cost 270l. each. Cottages were letting in Wimbledon at 9s. 6d. per week, so that they were giving a better cottage with more room in it at 2s. per week less than the rent of the district. As to the question of a bathroom, he could not agree with Mr. Jenkins, and would much prefer not to have food cooked in a kitchen where persons had been bathing themselves. As regarded cost, the dwellings worked out at a rent of about 1s. 6d. per room per week, as there were three bedrooms, kitchen, and sitting-room, leaving out the small scullery.

The members then proceeded to inspect the

bridge over the railway near to the station and the depot at Queen's-road, with the proposed extension on the east side of Ashcombe-road. Luncheon was served at the Baths, Worple-road, Mr. C. H. Lowe presiding, and the afternoon was devoted to inspections of the destructor at Streatham and the electric lighting station at Fulham.

DWELLINGS FOR THE WORKING CLASSES.

AT Carpenters' Hall, London-wall, E.C., on Thursday last week, Mr. W. E. Riley, the Superintending Architect to the London County Council, gave a lecture upon "Dwellings for the Working Classes." Mr. R. M. Beachcroft, L.C.C., presided.

Mr. Riley, whose lecture was illustrated with limelight views, said that the earliest efforts in connexion with this important question were initiated by the late Lord Shaftesbury, who introduced two Bills into Parliament in 1851 dealing with lodging-houses, in which term were included block dwellings. The Housing of the Working Classes Act of 1890, with its more recent amendment, formed the basis of the operations now performed in London and most provincial towns. The lecturer first illustrated overcrowding by pictures of the Boundary-street area before the improvement, Mill-lane, Deptford, and the Churchyard, St. Pancras, and he explained that a large number of persons were displaced in consequence of houses being pulled down for private enterprise and new buildings not being provided soon enough. He pointed out the details of an improvement scheme carried out by the Council and the huge expenditure involved in clearing the site. The Council had a very difficult task in providing cheap dwellings when there was no outside financial aid. Many of the big owners of dwellings bought their land from the old Metropolitan Board of Works at a cheap rate, and in some cases philanthropists had contributed large sums. The cost of land with the Council, taking into consideration the clearing of the site, was very heavy, and apart from the small profit which had to be shown, and the rates and taxes to be paid, they had to provide a sinking fund so as to hand the building over free in fifty-nine years. If the term was extended to ninety-nine years, or if there was no sinking fund at all, as in the case of some companies, how much less could be the amount of rent charged! But it must not be overlooked when considering the amount of rent which a family paid in an overcrowded place that when that family moved into one of the Council's buildings and paid more rent, they had more rooms and a greater air space. Mr. Riley then showed pictures of the various types of buildings used in the re-housing of the poor, including the dwellings erected by the Council at Millbank, Boundary-street, and those to be erected on Reid's Brewery Estate. He pointed out the difference between the associated tenements and the self-contained tenements; the domestic offices in the former being shared by two or three tenants. The former was generally considered the cheaper system. Plans of the Tottenham Estate were also shown, the rentals of which would range from 6s. to about 11s. 6d. The elevation was very picturesque, somewhat similar to the buildings already erected by the Council at East Greenwich. The lecturer also referred to the lodging-house for rent to be erected at Mill-lane, Deptford, which he said would be very similar to those erected by Lord Rowton, and to the lodging-houses built by the Glasgow Corporation for men and women and for families, in which the scale of charges was very low. In conclusion, he stated that in the Council's buildings every effort was made to prevent fire, and he showed pictures of the fire-resisting floors and the arrangements in the domestic offices.

A vote of thanks was afterwards moved by the Chairman, and carried.

HULL ROYAL INFIRMARY.—The report of the Hull Royal Infirmary shows that during last year plans were prepared by Messrs. Botterill, Son, & Bilson for an extension of the Nurses' Home, capable of accommodating twenty-two nurses. These plans have now received the approval of the Board, and it is proposed to proceed at once with the work at an estimated cost of about 4,000l., including furnishing.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The seventh meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on the 13th inst., Mr. R. H. Weymouth, vice-chairman of the section, in the chair. Mr. P. G. Maule read a paper on the subject of "The Architect and the Garden," which we will print in another issue. Mr. J. S. Blunt proposed a vote of thanks to the author for his paper. Mr. F. G. W. Buss seconded, and the discussion was continued by Messrs. W. A. Forsyth, W. A. Pite, R. H. Weymouth, and R. Weir-Schultz. Mr. R. Weir-Schultz, who attended as Special Visitor, gave a most interesting comment on the paper.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Erection of Homerton Sub-Fire Station.—On the recommendation of the Fire Brigade Committee it was agreed that the tender of Messrs. Martin, Wells, & Co. to execute for 8,120l. the work of erecting the Homerton sub-station be accepted.

Tenders.—The Asylums Committee reported the acceptance of the following tenders:—Additions to gas-holder plant.—Messrs. Newton, Chambers, & Co., Limited, -412l. Combined hot-plate and cupboard.—Messrs. J. & F. May, 95l.

Committees.—The standing and special committees were then elected. The following gentlemen will comprise the Building Act Committee:—

Messrs. C. Goddard Clarke, W. Davies, G. Dew, W. Goodman, R. W. Granville-Smith, G. A. Hardy, F. Hemphill, H. Jephson, G. B. Longstaff, R. Parker, Lieut. Colonel C. Probyn, H. R. Taylor, D. S. Waterlow, E. White.

The Historical Records and Buildings Committee was elected as follows:—

Messrs. J. A. Baines, J. W. Benn, W. W. Bruce, W. J. Collins, F. Dolman, J. D. Gilbert, R. W. Granville-Smith, H. A. Harben, E. J. Horniman, W. Leaf, J. F. Little, W. E. Mullins, G. H. Radford, G. S. C. Swinton, Sidney Webb.

Notices of Motion.—There were two notices of motion. One was in the name of Mr. Spokes, which desired the Local Government Committee to find out who were the shareholders in the companies owning gas, tramways, water, in London. A motion by Mr. Hubbard was in favour of third-class season tickets. Both were carried without discussion, and the Council adjourned at an early hour.

THE LONDON BUILDING ACT, 1804. THE TRIBUNAL OF APPEAL AND THE LINE OF FRONTAGE.

The Tribunal of Appeal under the London Building Act, 1804, sat at the Surveyors' Institution on Tuesday to hear an appeal by Mr. R. Elsey Smith, on behalf of Mr. E. C. Christmas, against the certificate of the Superintending Architect of Metropolitan Buildings, dated January 18, under sections 22 and 29 of the Act, defining the general line of buildings on the south side of Sydenham Park between the vacant land at the eastern end of the street and Sydenham Park-road. The Tribunal consisted of Messrs. Arthur Cates (chairman), A. H. Hudson, and J. W. Penfold. The grounds of appeal, as outlined by Mr. Vestbury Preston, the appellant's solicitor, showed that during 1900 the appellant, under the sanction of the London County Council, altered Burton Villa, Sydenham Park-road, the flank wall of which crosses Sydenham Park, and is distant 46 ft. from the centre of the roadway and parallel to it. The boundary wall next to Sydenham Park was set back to a distance of over 20 ft. from the centre of the road, a strip about 3 ft. 6 in. wide being given up to the use of the public without compensation. In August, 1900, the appellant applied to leave to erect a house adjoining No. 50, Sydenham Park, the main front to line with the flank of Burton Villa as altered. His application was refused by the London County Council. Another application was made for leave to erect a house with the front wall set back 48 ft. from the centre of the road. This application was made on the 13th of October 1900, and was refused. The Superintending Architect was then asked to define the frontage line, and he did so by certificate dated January, 1901. The appellant was aggrieved by the terms of the

certificate and appealed to the Tribunal under Section 25 of the Act. In arguing that the terms of the certificate should be modified, it was pointed out that the main front of 54, Sydenham Park-road was not as defined by the Superintending Architect, but 4 ft. nearer to the centre of the road, and that No. 52, a considerable structure, was in advance of the building line as defined. While Section 27 provided that the erection of the additions to Burton Villa did not, in consequence, affect the appellant's line in that part or adjoining parts of the road, there was, at the same time, nothing in that section to prevent the frontage thus created being considered in dealing with the frontage for future buildings, and it was reasonable that it should be thus considered. There being no other line established by this building, the line as defined by the Superintending Architect was not, it was contended, warranted by the circumstances. The appellant asked that the Tribunal should vary the certificate to a line running parallel with the centre of the road at a distance of 45 ft. from the centre, or at such other distance as the Tribunal considered reasonable.

Mr. Andrews, for the Superintending Architect, contended that the correct line of frontage was from the recess portions of No. 54 and the fronts of Nos. 50 and 52, Sydenham Park-road. Moreover, when application was made for the alteration of Burton Villa, which was a corner house, it was contemplated that the intervening spaces should be regarded as garden ground, but that the appellant had taken advantage of the previous consent by the County Council to alter the line of frontage.

After bearing evidence, the Tribunal directed that the certificate of the Superintending Architect should be so varied that the general line of building in Sydenham Park-road on the south side should be 45 ft. back from the centre of the road opposite the north-eastern angle of No. 54 to a point 46 ft. back from the centre of the road opposite the angle of Park Mansions at the corner of Sydenham Park. The Tribunal made an order for twenty guineas costs against the London County Council.

BOOKS RECEIVED.

A DICTIONARY OF ARCHITECTURE AND BUILDING. By Russell Sturgis, A.M., Ph.D. Vol. I.; A—E. (Macmillan & Co.)
THE MONASTERY OF SAINT LUKE OF STIRIS, IN PHOCIS. By Robert Weir-Schultz and Sidney Howard Barnsley. (Macmillan & Co.)
THE COTTAGE HOMES OF ENGLAND. By W. Walter Crotch. (P. S. King & Son.)
SPONS' ARCHITECTS' AND BUILDERS' PRICE-BOOK. By W. Young. Twenty-eighth edition. (E. & F. N. Spon.)

Correspondence.

To the Editor of THE BUILDER.

THE ARCHITECTURAL ASSOCIATION DAY CLASSES SCHEME.

SIR,—In your leading article of the 16th inst., in which you so ably sum up the advantages to be anticipated from this movement, you raise the question as to whether it will be necessary or desirable to carry on the evening school concurrently with the day classes.

The committee are not of opinion that the day classes will appreciably affect the evening work, for the reason that a large proportion of the Architectural Association students are assistants who cannot take advantage of any classes excepting those commencing after 6.30. The present students, moreover, who are pupils, are scarcely more free to attend a day course of training outside the office.

Eventually, of course, the evening schools may be modified in proportion to the success of those held in the daytime.

W. HOWARD SETH-SMITH.

BRICKLAYERS AND THEIR WORK.

SIR,—I trust in fairness to the operatives you will find space for these few lines. Much has been said about the idleness of workmen, more especially bricklayers; and whilst admitting that there are a few misguided men, who would cheerfully ruin an employer, yet the greater majority of men do a fair day's work. The reason brickwork was done at such absurd prices was because it was scamped and the workers were sweated. Ten years ago men could be bought body and soul for a halfpenny per hour or a few pots of beer; but since men drink less, they think more, and refuse to become beasts of burden, toiling at high pressure and going home fit only for bed. I have not only gone home tired, but got up tired, knowing I had to slave under a broiling sun, for bricklaying, although looking easy, is laborious; and when we come to think that a rod of

work weighs 15 tons and is equal to a wall 272 ft. long by 14 in. by 1 ft. high and has to be skillfully constructed to a prearranged form, the present cost is not out of the way. A BRICKLAYER.

WILLIAMS & COOKE.

SIR,—In your report of the above case in last week's issue it is stated that our Mr. Greenwood said that "the best slates came from Portugal and Penrhyn," whereas what he said was "Port Dinorwic and Penrhyn." We presume the similarity of the first syllable accounts for the error.

Again, in his evidence he stated that the "roughest" slates were used for damp courses, which does not necessarily mean the "worst."

Your report does not make it clear that the allegation that Portinadoc slates were ordered was entirely abandoned by the defence, and we will, therefore, thank you to publish this letter.

JOHN WILLIAMS & CO.

The Student's Column.

SANITARY FITTINGS AND PLUMBING II.—BATH WASTES AND OVERFLOWS, &c.

IMPROVEMENTS in bath wastes and overflows have in the main followed the same lines as the improvements in the corresponding parts of sinks and lavatories. The tendency has been to make the various parts more accessible for cleansing, to increase the size of the waste-outlet in order that the bath may be emptied more quickly and the waste-pipe and trap be self-cleansing, and to render the parts as simple and as easily adjusted as possible.

In some towns—Manchester, for example—the by-laws require that every bath shall be fitted with an overflow-pipe carried through an external wall, and left with the end exposed, so that any waste of bath-water can be detected by the water inspectors without entering the building. It is not customary to place a trap on such a pipe, as the flow of water through it would be so irregular that the trap would probably be unsealed by evaporation. An untrapped pipe, however, will serve as an air-trap unless some method of closing the opening is adopted. The simplest arrangement consists in fixing a flap-valve (fig. 1) on the end of the pipe; A is a copper valve and tube with curved spring on the top to prevent the valve opening too far. B is a brass valve with union for iron pipe, and C a brass valve for connection with lead pipe. The overflow-pipe is connected to the bath by means of a brass union and grating as shown in fig. 2, Chapter 7.

This kind of overflow is commonly adopted in cheap baths, a plain hole being left in the iron or other material to receive the grating. In towns where the connexion of the overflow and waste-pipe is not prohibited, a pipe is often taken from the overflow grating and connected with the waste-pipe. The joint ought to be between the bath and the trap, as shown in fig. 2, but the writer has known several cases where ignorant plumbers have fixed the trap close to the bath and connected the overflow pipe to the waste-pipe at some point beyond the outlet of the trap. A free current of air can therefore pass up the waste-pipe to the junction with the overflow pipe, and then up the latter to the bath room. As the waste-pipe of a bath is often to some extent fouled with soapy or other matter, the air may be contaminated, and, unless the foot of the pipe is properly disconnected, still fouler air from the drains may be carried into the house.

With grated overflows of the type already described, the waste is generally an ordinary washer with fly-nut, union, and bent tail (fig. 3), fitted with a plug and chain. The plug may be of brass, either solid or sunk, or of indiarubber (with or without metal core), or of vulcanite. In the case of baths, which (being fixed at a low level) are liable to severe blows from falling plugs, it is highly desirable that the plugs should be as light and soft as possible; this is especially necessary for japanned and metal-enamelled baths, as a single blow from a hard and heavy plug may destroy the enamel at the point of impact and expose the metal beneath. For this reason indiarubber and vulcanite plugs are to be preferred; the extra cost is very small.

The plugs for baths are made in various sizes—1½ in., 1¾ in., 2 in., 2½ in., 3 in., and even 4 in. The waste shown in fig. 3 has the following dimensions for a 2½ in. plug—diameter

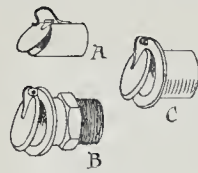


Fig. 1.

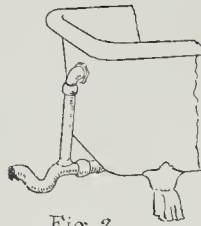


Fig. 2.

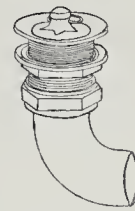


Fig. 3.

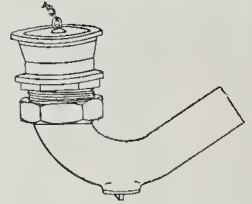


Fig. 4.

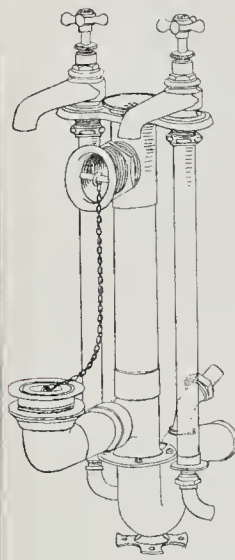


Fig. 5.

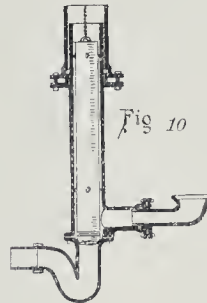


Fig. 6.

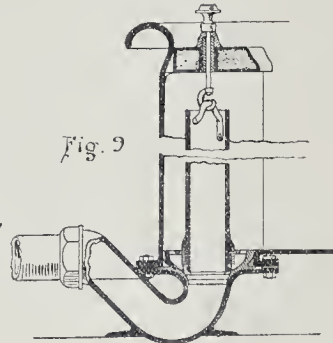


Fig. 7.

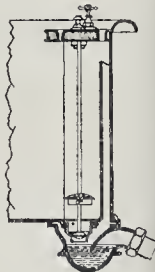


Fig. 8.

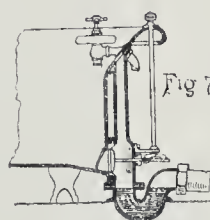


Fig. 9.

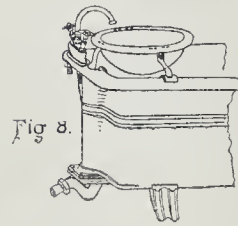


Fig. 10.

Illustrations to Student's Column.

of flange, 4 in.; and diameter of screw, 2½ in. It is made in brass (either plain or nickel-plated) or in white metal. The waste with tapered tail, shown in fig. 4, Chapter 7, is well adapted for baths; the plug is 3 in. in diameter (either brass or vulcanite), and the tail is tapered from 3 in. to 2¼ in. This waste ensures a rapid discharge from the bath and a thorough scouring of the trap and waste-pipe. Bath plugs ought not to be less than 2 in. in diameter, or the waste-pipes less than 1½ in.

Sometimes in cast-iron baths a cast-iron trap is provided at the outlet. Many of these are dip-traps, and are far from satisfactory. If an ordinary chain and plug is used the overflow pipe from the bath must be carried through an external wall for the reasons already stated, or made to discharge over a lead safe from which a pipe must be carried through the wall, and finished with a flap valve. The brass bath-trap shown in fig. 4 is of better shape, and has a 3-in. rubber or vulcanite plug with cross-bars below, and a trap tapering to 2 in. at the outlet. The flange is 4½ in. in diameter, and the screw 3½ in., the total height being 8 in. The trap is provided with a cleansing screw.

Instead of the lead overflow pipe and trap shown in fig. 2, other metals may be used. In Milne's "Exposed Combined" bath-fittings (fig. 5), the principal parts are of gun-metal, either polished or nickel-plated. These fittings are made in three sizes, having respectively 2½-in., 3-in., and 4-in. vulcanite plugs, 2-in., 2½-in., and 3-in. cast-brass traps, with 1-in., or 1¼-in. couplings for anti-siphonage pipes, 2-in., 2½-in., and 3-in. overflows and standards, and 1-in. or 1¼-in. solid-drawn copper supply pipes (13 B.W.G.). A perforated soap-tray, 4½ in. in diameter forms the top of the over-

flow standard, and can be unscrewed for cleaning the standard and trap.

In many cast-iron baths the overflow-tube forms part of the casting; fig. 6 is an example. The trap is of cast iron 2½ in. in diameter and glass-enamelled inside, and forms a connexion with the foot of the overflow-tube. The plug is of the safety type, and is actuated by a spindle passing through the outlet grate, which is fitted with a bayonet catch so as to be easily removed when the valve or trap requires cleaning. It is an advantage to have the grating above the plug, as the openings in it can be more easily kept clean than when the grating is in the washer below the plug. A slab of porcelain is fitted across the foot of the bath to form a tray for soap, sponges, &c. This tray drains into the bath through the perforation A; another perforation B is made near the back of the slab, so that a brush can be passed through to clean the overflow-tube.

The overflow in Shank's "Perfecto" bath (fig. 7) is merely a modification of the last. The upper part of the foot of the bath is made with a slope, so that the overflow is vertical and more easily cleaned. The overflow pipe is oblong in section, and is of glass-enamelled cast iron, swelling out at the foot to fit the 2½-in. glass-enamelled cast-iron trap, which is fitted with a brass union for connexion to the lead waste-pipe. A special feature of the bath is the waste arrangement, with valve working horizontally and actuated by a spindle and knob, and with a hinged nickel-plated brass grating. The porcelain soap-tray supported by the taps is quite detached from the bath itself, so that every part of the bath and tray can be easily cleaned. Instead of the porcelain tray, a nickel-plated brass soap-and-sponge

holder is sometimes used and has the advantage of being easily removed.

Standing wastes and overflows are largely used for baths. Fig. 10 shows the ordinary type. The standing overflow, of copper or brass, is placed in a tube at the foot of the bath, and has generally a rubber covering at the end to make a tight joint on the valve seating. It is raised by means of a chain (or spindle) and knob. Doulton's improved overflow (fig. 9) has a standing overflow placed in a recess at the foot of the bath, the overflow can be removed by lifting it upwards after raising the waste-pull. A porcelain soap-dish is fitted across the foot of the bath. The trap is of glass-enamelled cast-iron, 2 in. in diameter, and the outlet grating is of large size flush with the bottom of the bath.

As a rule the fittings are arranged at the foot of the bath, but cast-iron and other baths are now made with the fittings arranged at the front, a position which is often advantageous when the bathroom is small. The combined bath and lavatory shown in fig. 8 is also useful in similar situations. The bath is of cast iron, painted, japanned, or enamelled in various ways, and the lavatory basin is of enamelled iron, made to tip up and discharge the contents into the bath. The hot and cold water is supplied through a swivel arm, which can be turned to fill either the basin or the bath. A soap dish is cast at one corner on the roll edge.

HONORARIUM TO CITY ARCHITECT, EDINBURGH.
At a recent meeting of the Edinburgh Town Council it was decided to grant an honorarium of £1000, to Mr. Morham, the City Architect, for extra work at the new City Chambers and the City Hospital.

GENERAL BUILDING NEWS.

RESTORATION OF LICHFIELD CATHEDRAL.—A special thanksgiving festival has just been held at Lichfield to mark the completion of the restoration of the cathedral. The Birmingham *Weekly Mercury*, in a brief review of the restorations which the past nine years have witnessed, says that the central tower and spire have been repaired; new mullions have been placed in the two windows of the Lady Chapel, and its buttresses have been repaired; the south transept has been repaired; the north transept has been thoroughly renovated and a new window, on the exact lines of the original, now adorns it; the parapets and clearstory in the choir and Lady Chapel have been repaired, as have also the library buttresses; and the north aisle of the nave has been secured against further decay, though the proposed repairs to this part of the building have not been carried out, the Dean and Chapter being anxious to leave it undisturbed because of its special antiquarian beauty and interest. Internally the Lady Chapel has been adorned with a reredos of triptych form, carved by the peasants of Oberammergau from a design by the artist, and the choir has been constructed at the various entrances to the Consistory Court, where may be seen part of the wall of the second church which occupied the site before the cathedral was built; and sacristy fittings have been added. St. Chad's Chapel, which for a long time had been used as a munition room, has been restored to its original purpose at a cost of 12,000l., was originally asked for in order to carry out the works that were considered absolutely necessary, but so generously were subscriptions made that nearly 24,000l. was received, and the Chapter funds and other sources also yielding more money than had been expected, the Dean and Chapter were enabled to undertake further desirable restorations. Repairs to the fabric absorbed 15,000l., for some parts were found to be worse than was expected, and other contingencies swelled the cost. Mr. R. Bridgeman, of Lichfield, has executed all the repairs to the fabric, both in wood and stone, under the direction of Mr. J. O. Scott, the architect. The raising of the roofs to their original pitch, and the restoration of the stone groining in the nave, which were recommended by Mr. Scott and Mr. Christian, though not regarded as a necessary work of pressing importance, were included in the scheme. They remain to be effected if at any time money for the purpose is placed in the Chapter's hands. The work is estimated at 5,000l. A request for 3,000l. for ornamental objects, such as statuary, carved woodwork, and stained glass, was met by the contribution of nearly 9,000l., so that here again the Chapter were able to undertake more than was at first contemplated. Eighteen windows have been filled with stained glass, at a cost of about 4,400l., and forty-seven statues—twenty-two of alabaster and the remainder of stone—have been added, so that no niche which was ever filled is now vacant. Large and small, there are more than 200 statues. Twelve more figures are to be executed in alabaster and placed in the open arcade on each side of the reredos. The fund for statuary and stained glass was obtained in large sums from a few donors, but in order that the many others who desired to do so might have a share in the decorative work, the memorial window to Bishop Hackett was chosen as the object to which the offerings and collections throughout the festival should be devoted. The window has cost about 200l. It is just above Bishop Hackett's tomb in the south aisle, and depicts the Cathedral as he found it in 1601, with the central spire in ruins and the roof battered in.

BAPTIST CHURCH, KIRKDALE, LANCASHIRE.—On the 6th inst. the foundation-stone of the new Walton-lane Baptist Church, Kirkdale, was laid. The new buildings occupy a site at the corner of Walton-lane, Fountains-road, and Barry-street, directly facing the Airedale-road entrance to Stanley Park. The buildings, which are Classic in style, freely treated, will consist when completed of a basement schoolroom, 49 ft. by 45 ft., with accommodation for 400 persons. On the same floor there will be five classrooms and conveniences, with two staircases. The whole of the basement will be well lighted, the chapel being raised considerably above the surrounding footwalk. The schools will be approached by two flights of stone steps, 6 ft. wide, from Fountains-road and Barry-street, and this floor will be laid with pitch-pine wood blocks. The ground floor consists of a chapel, 54 ft. by 43 ft., with side transepts, and will have accommodation for 400 adults. On this floor there are to be two vestries. The main entrances to the chapel are from Walton-lane and Fountains-road, and lead into entrances containing the gallery staircases, and then to a vestibule before entering the chapel. The gallery, which is situated on three sides of the chapel, will provide seating accommodation for 310 persons. The side galleries will have two rows of pews, and the end gallery and transepts seven and eight respectively. The pulpit will be placed in the chancel, with the baptistry immediately in front. The main front of the chapel will face Walton-lane, with a main gable flanked on each side with staircase wings and porches. The three principal elevations will be carried out in red pressed Accrington

brick, with Cefn stone dressings. The whole of the building will be heated with a low-pressure system of hot water. The building is to be lighted throughout with electricity. The total cost, exclusive of land, is about 5,000l.; and the contractors are Messrs. Tougl & Billing, of Liverpool, and the architects, Messrs. Richard Owen & Son.

CHAPEL, ST. JOSEPH'S ORPHANAGE, MOUNTJOY-STREET, DUBLIN.—Within the last year an addition has been made to St. Joseph's Orphanage by the erection of a little chapel for the use of the sisters of the community and children of the orphanage. The new chapel, which is dedicated to St. Joseph, consists of nave, 60 ft. long by 22 ft. 6 in. wide, in which is the nuns' choir and a space for the accommodation of the children. The sanctuary is 16 ft. long by 16 ft. wide. There is a side chapel and sacristy accommodation. The principal entrance to the nave is at the west end. The nave is lighted on the sides by lancet windows, having trefoil cusped heads. The sanctuary is lighted at the side by a two-light tracery window, and the window over the high altar in the sanctuary gable is a four-light window, filled in with tracery. The windows have moulded labels overhead. There is an organ gallery at the west end of nave, with a panelled ornamental front. This gallery is approached by a staircase carried up in an octagonal turret lighted by loop-hole windows and surmounted by an embattled parapet. The high altar is of white statuary marble. The altar table is supported on coloured marble shafts, with carved and moulded caps and moulded bases, and the centre panel in the frontal of the altar is filled with a sculptured group representing Christ blessing the little children. The reredos has richly moulded arches with coloured marble shafts, having carved and moulded caps and moulded bases, and carved and moulded cornice. The tabernacle and canopy are also of white statuary marble, with coloured marble shafts. There is a basement under the chapel comprising refectory, kitchen, serving-room, scullery. The building is in the Gothic style of the Early English period. The walls generally are built of brickwork, and the doors, windows, and buttresses have dressings of chiselled limestone, while the walls of the basement story are carried up in granite. The contractor for the work is Mr. Kevin Toole. The stained glass artist, and the high altar executed by Mr. Edmund Sharp. The building was carried out from the plans, and under the superintendence, of Mr. Wm. H. Byrne, architect, Dublin.

WESLEYAN CHAPEL, MANSFIELD.—The opening of a new chapel in connexion with the Wesleyan Methodist denomination at Mansfield took place on the 6th inst. The building, the foundation-stones of which were laid in July last, is situate at the junction of Rosemary-street and Byron-street. The original scheme was to erect a chapel capable of accommodating 600, but as yet the nave only has been completed, providing room for 300 people. Mr. J. E. Goodacre, of Mansfield, was the architect, the contract being executed by Messrs. Vallance & Blythe, Mansfield, at a total cost of 2,358l. 2s.

NEW WESLEYAN CHURCH, BEESTON, NOTTINGHAM.—The foundation-stones of this church were laid on the 6th inst. The premises comprise church with nave, transept, and choir gallery, and school in the rear portion of the site. In the church, which has a gallery round three sides, there is accommodation for about 750 persons. Ample vestry accommodation is provided for the minister, choir, &c. The organ will be placed behind the choir gallery and the rostrum in front. The school premises consist of a large assembly room, an infants' school, an adults' classroom, a ladies' room, and seven classrooms, which are grouped round the large room and open out into it. The exterior, designed in the Decorated style of Gothic architecture, is of pressed brick with facings and tracery windows of rich design in stone. The entrance front faces Chilwell-road, and at the south-west corner is placed a tower and spire rising to a height of about 100 ft. The interior woodwork of the roof and pews is pitch pine, the roof being wagon-headed in shape. The tracery windows will be filled with ornamental tinted leaded lights. The cost of the entire building will be about 6,000l., and the church portion is at present in course of erection. The architect is Mr. W. J. Morley, of Bradford and Harrogate.

BOARD SCHOOL, BALBY, YORKSHIRE.—The memorial stone of a board-school which is being erected at Balby was laid on the 13th inst. Mr. F. W. Masters, of Doncaster, is the architect, the contractors being Messrs. Gill & Son. The lighting is being carried out by Messrs. Farr & Son.

THE BUILDING TRADE IN DUNDEE.—Not for many years has the outlook in the building trade in Dundee in all its branches been so gloomy and unpromising as is now the case. After a period of unexampled prosperity a reaction has set in, and operations are almost at a standstill, with no prospect of an improvement now or in the near future. Both employers and men are feeling the pinch keenly. Of the latter nearly a fourth are unable to find regular employment. This unsatisfactory state of affairs is, in the opinion of the employers, due in a great measure to the almost prohibitive prices of material, as well as, in a lesser degree, to the prevailing high rate of wages demanded by the employees, both circumstances inducing speculators to postpone their transactions

till such a time as these can be more favourably and profitably carried through. The best index to the position and prospects of the building trade is the state of the property market. Not only are the prices which obtained two or three years ago still maintained, but there seems to be no disposition on the part of any one to purchase property. Within the last twelve or eighteen months, also, the rate of interest has increased from 3 to 3½ per cent. Three years ago one could borrow as much money as one desired at 3 per cent.; in fact, there was a scramble amongst investors to lend at that rate. Now the accepted scale is 3½ per cent., and, unless in cases where loans have been granted for a fixed time, the proprietors are being called upon to pay the higher rate. Again, there are indubitably a great many houses standing empty, and these are the most modern and high-class dwellings, for which abnormal rents are charged. Another thing which influences investors to hold aloof is the uncertainty that prevails as to what the future will produce with regard to the rates of material and wages, and it is believed that if these rates could be settled on any basis of continuity, it would go a long way towards stimulating the industry.—*Dundee Advertiser.*

ALBERT WORKS, LAMBETH, S.E.—On February 25 a foundation-stone was laid at these works to commemorate their reconstruction owing to the widening of the London and South-Western Railway Company's line. The works belong to Mr. B. E. Nightingale, builder and contractor, and have been practically rebuilt from the design of Mr. Alfred E. Nightingale, architect. They consist of a range of stores, saw, planing, and moulding mills, fitted with new and modern machinery, a new chimney shaft of over 100 ft. high, offices, boiler, and engine-houses, rain-water reservoir tank, new gables and flats, yard foremen's and timekeeper's offices, and new dwelling for caretaker.

CHURCH HALL, FETTERCAIRN, KINCARDINESHIRE.—A church hall is to be erected at Fettercairn from plans by Mr. D. Wishart Galloway, of Brechin. The contractors are as follows:—Mason, Mr. D. Douglas, Edzell; joiner, Mr. Ritchie, Thornton; plumber, Mr. Fox, Edzell; plasterers, Messrs. Burness & Son, Montrose; slaters, Messrs. Lindsay & Son, Montrose.

VOLUNTEER DRILL HALL, PORTSMOUTH.—The drill hall which has been erected in Stanhope-road, Portsmouth, for the 3rd Volunteer Battalion of the Hampshire Regiment, was opened on the 6th inst. The building is of dark red brick with Bath stone dressings. The central hall measures 144 ft. by 118 ft., the floor being laid with tarpaving by Messrs. Bradshaw, of Southsea. The walls are coloured with Appinall's water paint. The hall will be illuminated by eight electric arc lamps, the fittings having been executed by Messrs. Frye, Harris, & Co., of London. The small hall is fitted as a gymnasium, its dimensions being 76 ft. by 42 ft. The floor of this hall is of Elnor's pitch-pine blocks. The lighting will be by incandescent lamps. The building contains also a dining-room, kitchen, &c., besides the officers' quarters. The plans were prepared by Major A. H. Bone, of Portsmouth. Mr. J. Crockerell, of Southsea, was the builder, his foreman being Mr. J. F. Flux. The clerk of works was Mr. G. Felton Lancaster.

PROPOSED NEW HOSPITAL AT HAMPSHIRE.—Sir Richard Temple presided recently at the Hampstead Town Hall at the annual meeting of the Hampstead Hospital, and announced that the council of the hospital had secured a site at Hampstead-green for the proposed new hospital. Mr. Keith D. Young had been appointed architect of the new building, which was to contain fifty beds, and to cost 20,000l.

WESLEYAN CENTENARY HALL, CITY.—The Wesleyan Centenary Hall in Bishopsgate-street Within is being pulled down. New premises for the Wesleyan Methodist are to be erected on the site. The architect is Mr. Cuthbert.

ART GALLERY, WHITECHAPEL.—The art gallery which has been erected in Whitechapel was opened on the 12th inst. A reproduction of a design for the building by Mr. C. Harrison Townsend, the architect, appeared in our issue for May 30, 1896.

SANITARY AND ENGINEERING NEWS.

ENGINEERING CONGRESS, GLASGOW.—A Congress of Engineers is to be held in connexion with the Glasgow Exhibition from September 3 to 10, under the presidency of Lord Kelvin, Sir Douglas Fox being chairman of the London Committee. The Congress will be arranged under the following sections:—(1.) Railways.—Chairman, Sir Benjamin Baker; Hon. Secretary, Mr. R. Elliott Cooper, 8, The Sanctuary, Westminster, London, S.W. (2.) Waterways and Maritime Works.—Chairman, Sir John Wolfe Barry; Hon. Secretary, Mr. L. F. Verpon-Harcourt, 6, Queen Anne's-gate, Westminster, London, S.W. (3.) Mechanical.—Chairman, Mr. William H. Maw; Hon. Secretary, Mr. Edgar Worthington, Institution of Mechanical Engineers, Storey's-gate St. James's Park, London, S.W. (4.) Naval Architecture and Marine Engineering.—The Institution of Naval Architects: Chairman, the Earl of Glasgow; Hon. Secretary, Mr. George Holmes, 5, Adelphi-terrace, London, W.C. (5.) Iron and Steel.—Chairman, Mr. William Whitwell; Hon. Secre-

tary, Mr. Bennett H. Brough, 28, Victoria-street, Westminster, London. S.W. (6) Mining.—The Institution of Mining Engineers: Chairman, Mr. James S. Dixon; Hon. Secretary, Mr. James Barrowman, Stancaere, Hamilton, Scotland. (7) Municipal.—Chairman, Mr. Charles H. Lowe; Hon. Secretary, Mr. Thomas Cole, 11, Victoria-street, Westminster, London, S.W. (8) Gas.—Chairman, Mr. George Livesey; Hon. Secretary, Mr. J. W. Helps, Gasworks, Croydon, London. (9) Electrical.—Chairman, the President of the Institution of Electrical Engineers; Hon. Secretary, Mr. W. G. McMillan, 28, Victoria-street, Westminster, London, S.W.

STAINED GLASS AND DECORATION.

WINDOW, DONNINGTON WOOD CHURCH.—Recently the chancel window of St. Matthew's Church, Donnington Wood, Salop, was filled with stained glass as a memorial to the late vicar. The subjects are:—"The Crucifixion," in the centre, St. John and Mary on either side; below, on the base, St. Matthew and Chad and Aidan. The subjects are placed under canopies of a light treatment, the colours being confined to the backgrounds mostly. The window was designed and executed by Mr. T. W. Camm, of Smethwick.

NEW WINDOWS, GATESHEAD CHURCH.—The large three-light windows in the north and south transepts of St. Helen's Church, Gateshead, have just been filled with stained glass by Messrs. Percy Bacon & Bros., of London. They consist of single figures under canopies, representing on the one side the four Evangelists, on the other the major prophets, two figures being placed one over the other in the centre light. The one is erected to the memory of Edward Joyce, who built the church, and the other to the Rev. W. H. Sissons, the late vicar.

FOREIGN.

FRANCE.—The Municipal Council of Paris has officially taken possession of the smaller Art Palace on the Champs Elysées, and has under consideration a scheme for its decoration presented by M. Girault, the architect of the building.—A marble bust of the Duc d'Aumale has been placed in the Salle des Séances of the Institut.—The Committee for the Gambetta Monument, which is to be erected at Bordeaux, has accepted the sketched design by M. Dalou, which represents Gambetta standing with his arms crossed, having on his right an allegorical group representing National Defence, and on the left another representing Wisdom coming to the support of Liberty. At the base of the pedestal are sculptured the armorial bearings of Bordeaux, backed by a trophy of flags.—A new firemen's barracks is to be built at Montmartre, behind the church of the Sacré Cœur.—The Chamber of Deputies is occupied with an important scheme for the improvement of the port of Bastia (Corsica), at an estimated expense of 1,250,000 fr.—M. Detaille has presented to the Carvalet Museum a picture representing the Porte Maillot in the month of November 1870, during the siege of Paris.

—A hôtel is to be built at Marseilles for the Société des Architectes de Bouche du Rhone, on a site on the Prado left to them for that purpose.—M. Adrien Chancel, architect, and "Inspecteur-Général de l'Enseignement du Dessin," has died suddenly at Perpignan, during a tour of inspection. M. Chancel, who was born in 1853, has had a brilliant career. He was a pupil of Constant Dufeux and of Moyaux, carried off many prizes at École des Beaux-Arts, and in 1877 obtained the Second Grand Prix in Architecture. He received medals in the Salons of 1879 and 1884, and a medal of the Third Class in the 1889 exhibition. In 1894 he obtained the cross of the Legion of Honour. He had distinguished himself in various public competitions, especially in that for the commemorative monument for Versailles, and was the selected architect for the new Mairie of Ivry-sur-Seine. Among his numerous works may be mentioned the restoration of the cathedral at Auch, and the erection of the Salle des Fêtes and the monumental grille of the Palais des Elysées, to which he was officially attached as architect. He was a remarkable draughtsman, and an architect with a great deal of perception in design.—The death is also announced, at the age of eighty-one, of the painter Charles Jalabert, an old pupil of Delarocche. He was at first chiefly known as a painter of religious and historical subjects, and in the Salon of 1855 his picture of "Christ on the Mount of Olives" was much remarked. But his subsequent and greater success was in portraiture. Among his principal works of this class may be named the portraits of the Duchesse d'Albe, Mme. de Montigo, the Comtesse de Paris, the Duchesse d'Aumale, and the Princesse de Nemours. He was elected "Officier" of the Legion of Honour in 1867. For the last few years his name had been nearly forgotten by the general public.

INDIA.—The Government of India has agreed to make a contribution of 45,000 rupees from Imperial revenues towards the cost of enlarging and improving St. Mark's Church, Bangalore. The consulting architect to the Madras Government is to carry out the work.—The Indian Government has decided to erect a large girder bridge over the

Swat river, and has already called for detailed estimates.—Large military buildings are being erected at Manipur for the permanent garrison; the cost is estimated at seven lakhs of rupees.—Mr. C. H. Stevens, of Bombay, is the successful competitor for the best design for the new military secretarial buildings in Calcutta.

RUSSIA.—We learn that the granite industry of Finland has of recent years been so successful that new quarries have been opened up in several places, particularly by the Finnish Stone Industry Company, of Helsingfors. Mr. J. Sederholm, chief of the Geological Survey of Finland, has been mainly instrumental in this, and the endeavour is to bring into the Russian market the fine-grained granites found near the town of Nystad, to the north of Abo. At the present time three different kinds are being quarried, one of silver-grey tint, suitable for rubble and pavement work; another of brownish-grey tint, which occurs in thick masses; and the third light grey, especially suitable for architectural purposes, and which is now being employed in the construction of the Finnish National Theatre, at Helsingfors.—Messrs. C. Cammell & Co., of Sheffield, are about to establish large works at Odessa, for the manufacture of edge tools and hardware generally.

UNITED STATES.—The death is announced of Mr. Benjamin Silliman, a well-known architect of New York. He studied architecture for some years at Charlottenburg, near Berlin, before practising in America. Amongst the notable buildings designed by him are the Morse building, and Temple-court, both in New York City.—Another celebrated architect, Mr. Thomas R. Jackson, of New York, has recently died. He was born in London in 1826. Amongst important works designed by him are the Old Academy of Music, the Old Vaudeville Theatre (now the Star Theatre), Tammany Hall, and the Jerome Park clubhouse. At one time Mr. Jackson was appointed Superintendent of the Federal buildings in New York.—The Board of Regents of New York University has had for three years in preparation a list of photographs of paintings, statues, and works of architecture, suitable to be hung in schools; the work is now approaching completion.

MISCELLANEOUS.

OVERCROWDING IN THE EAST END.—A conference on the housing question was held on the 14th inst. in the boardroom of the Whitechapel Guardians, Mr. James Brown presiding. A paper on overcrowding was read by the Rev. W. H. Davies, who pointed out that the average population for the whole of London was thirty-seven per acre. In Whitechapel there were 195 persons to the acre, while in Spitalfields the figures were 330. The immigration of the poor aliens and people from the country was unquestionably answerable for much of the overcrowding. The increase of rents was largely due to the alien, but they must not forget that that class had introduced new and useful industries.—After discussion, a resolution was passed to the effect that the conference could not emphasise too strongly the evils of overcrowding, and it was the duty of the authorities to deal with such promptly and effectively. A resolution was also moved affirming that the clearances carried out and the new buildings erected had not met the needs of the classes affected, but the motion was not pressed. A resolution to the effect that every person having any interest in inhabited houses should be registered was adopted, as also one recommending that the value of a site should remain as an asset for all time, and that the period of repayment should be extended beyond the period of sixty years. It was also affirmed that no clearances for public or private purposes should be allowed until provision had been made for the population dispossessed.

THE PYX CHAPEL, WESTMINSTER.—In the House of Commons on the 14th inst. Mr. G. T. Kenyon asked the First Commissioner of Works to state by whose authority the custody of the Pyx Chapel had been transferred from the Board of Trade to the Office of Works; what was the object gained by the transfer; and whether he could give any assurance that the chapel would not be submitted to any process of restoration, or improved away altogether, as was the case with the Rolls Chapel.—Mr. Akers-Douglas: The transfer of the Pyx Chapel was made by leave of the President of the Board of Trade, with the approval of the First Lord of the Treasury. The object is to place the chapel in charge of the authority who has already the care of the Chapter House adjoining, and whose function it is to maintain buildings of national interest. The chapel will not be submitted to any process of restoration.

DISCOVERIES AT FURNESS ABBEY.—The excavations at the ruins of Furness Abbey, which have been going on for some years under the direction of Mr. St. John Hope on behalf of the Cumberland and Westmoreland Archaeological and Antiquarian Society, have been renewed within the past few days, and the guide, Mr. Jesse Turner, while working in the refectory, has come across a sub-vault of Norman dormitories, or burial-place, in the south wall. At another point, the remains of a very fine fire-place have been discovered.

ELECTRIC LIGHTING, DARLINGTON.—The Corporation electric lighting at Darlington was inaugurated on the 11th inst. The electrical engineers were Messrs. R. V. Lunn.

MUSEUMS ON SUNDAY.—The Sunday opening of the South Kensington Museum, the branch Museum at Bethnal Green, and the Geological Museum in Jermyn-street, will be, till further notice, from 2 to 6 p.m.

PUBLIC IMPROVEMENTS, NOTTINGHAM.—At the Guildhall, Nottingham, recently, Colonel Luaro R.E., held a Local Government Board inquiry into an application by the City Council for permission to borrow 34,000l. for purposes of street improvement and the reconstruction of Carrington-street bridge. The Town Clerk (Sir Samuel Johnson) explained that 24,000l. was required for the purchase of property in Parliament-street in connexion with the proposed widening of that thoroughfare. The reconstruction of the Carrington-street bridge would cost 10,000l., the remainder of the loan asked for. Evidence as to the structural work was given by Mr. A. Brown, the City Engineer.

NORWICH MASTER BUILDERS' ASSOCIATION.—The second annual dinner of the Norwich Master Builders' Association was held on the 14th inst. at the Royal Hotel, Norwich. Mr. G. E. Haves, President, occupied the chair. The "Health of the King" having been proposed from the chair, the military and naval toast was proposed by Mr. E. Reeve and responded to by Mr. H. Harper Smith. The President then gave the toast of "Prosperity to the City of Norwich." Mr. Norman Cunneill, in reply, remarked that sometimes the citizens were apt to think, looking to the decay of the city's old manufactures, that things were going backward; but it had to be admitted that in place of those which had disappeared others had sprung up—trades so important that they were continuing the prosperity of Norwich, and would, he believed, long continue to do so.—"The Health of the Architects and Surveyors" was proposed by Mr. J. S. Smith (the vice-chairman), who said that if building work was to be successful there must be co-operation between the builder and the architects and surveyors. Whilst every consideration should be given to the employer and his wishes, the work should be conducted in such a way that the builder should be fairly remunerated, and the building contracts should be so drawn that they did not press too harshly upon the contractor, who had to incur enormous risks and liabilities. As far building contracts, it was felt by the Association that every builder's contract should provide for the architect, so that in the event of any dispute arising it could be fairly and easily adjusted to the satisfaction of both parties. Happily, in Norwich, the two interests got on fairly well. Take the clause respecting the granting of certificates. The architects were never found too slow in granting the first certificate, nor too fast in granting the final one.—The toast was acknowledged by Mr. E. Boardman, Mr. J. B. Pearce, and Mr. A. E. Collins. Mr. Collins said that Norwich ought to be proud of its architects in practice and its builders in business. Building work was carried on in Norwich in a very creditable style. There was a substantiality about it that was not to be found in many cities. "The Norwich Master Builders' Association" was proposed by Councillor Barnard, who said that he had some thirty years' experience of the master builders of Norwich, and that capable business men no one could wish to be associated with. The President, in response, said it was now three years since the Association established itself in Norwich, and in that time they had made themselves a power in the city. "The Merchants of Norwich" was proposed by Councillor W. T. Scaries. The Mayor (Mr. J. Dawson Paul), Mr. F. Havers, and Mr. G. Jewson responded, and the toast list closed with the health of "The Visitors," proposed by Mr. J. Youngs.

HAMPSTEAD HEATH PROTECTION.—The fourth annual general meeting of the Hampstead Heath Protection Society was held in the Drill Hall, Heath-street, Hampstead, on the 19th inst., when it was resolved to oppose the proposed Tube Railway under Hampstead Heath. Sir Richard Tople, who proposed a strongly-worded resolution against the tunnel, could not understand why it was wanted. The station at Lily Hill was near the Heath, and it gave ample access to it. He saw great danger to the fauna and flora of Hampstead Heath in the proposal. The resolution was seconded by Mr. Pooley, and carried. The Earl of Mansfield presided at the meeting, and it was stated that a petition against the proposal would be sent to the House of Lords.

THE MUNICIPAL YEAR-BOOK.—"The Municipal Year-Book for 1901" (Edward Lloyd Limited, Salisbury-square, E.C.) has been improved and made more convenient for reference by placing towns (about which so much interesting and useful information is given) in alphabetical order, instead, as was done in previous issues, of dividing them into three categories—great towns, country boroughs, and other incorporated towns. Under the heading of the towns a short general sketch is given of the main features of the municipal work, and in most cases in addition will be found information respecting baths, free libraries, markets, refuse and sewage disposal, technical education, &c. Information as to trams, water, &c., is also given, at the end of the book. A long list of Urban District Councils (other

than town councils) is also included in the work, as well as an account of municipal government in Scotland and local government in Ireland. Altogether it is an admirable handbook to municipal government.

CROYDON AND DISTRICT BUILDERS' FEDERATION ANNUAL DINNER.—The annual dinner of this Association took place on Tuesday evening, February 19, at the Greyhound Hotel, Croydon, Mr. S. Page, President, in the chair. Mr. Alderman Taylor proposed the toast of "The Federation," and in his reply, the President mentioned the continual increase in the number of fine buildings erected in the main streets of the town (to make way for which most of the old narrow streets were gradually disappearing), and the improved appearance of the town from year to year. Passing over the work of the committee during the past year, he devoted the remainder of his remarks to the uselessness, and need of abolishing, the present system of security for contracts for public works, pointing out the trouble and worry added thereby to the builders' burden, especially now that the insurance companies, without exception, refused to secure the builder, even when largely increased premiums were offered. Mr. D. W. Barber proposed the London Master Builders' Association, pointing out that the thanks of builders generally were due to the London Association for their help and encouragement in all matters relating to their mutual benefit during the past year.

NEW MAP OF LONDON.—Mr. Edward Stanford sends us a new map of London, or at least a map in which new existing or proposed lines of railway or tramway are inserted. It is more especially for the use of those who are interested in any way in new schemes that are before Parliament. In the corner is a list of plans for Metropolitan railways, tramways, and miscellaneous improvements, deposited with the London County Council up to November 10, for consideration during the session of 1901. These are numbered, and the lines of route or the districts affected are correspondingly numbered on the map.

BUILDING TRADES FEDERATION.—In their Report on the six years' work of the Birmingham District Building Trades Federation, the Executive say that for four years they have been able to report a state of trade eminently satisfactory. The war has doubtless been one of the causes of a change for the worse, which has visited all the branches of the building industry in our district. The last year of the nineteenth century will, however, compare favourably with any since the Federation came into existence. Two societies have been added to their number, the wood carvers, Branch 19, and the hot-water fitters, Branch 5, making the total sixteen, which is second to none in the kingdom. In the spring of the year the operative plasterers and masons succeeded in obtaining in a peaceful manner an increase of wages. During the summer an effort was made to obtain funds to assist the building trades' gift to the nation. Many of the members of their societies heartily contributed. The architects, builders, builders' merchants, and employees worked harmoniously. The result was gratifying, the sum forwarded having been greater than from any other provincial town. Their relations with the master builders were never better. The working rules and wages now prevalent were not likely to be disturbed for at least another year. There is, however, a feeling that a uniform working time for all trades should be the ideal. Probably efforts to bring this about will be made in the near future. Financially their position is better than the most sanguine could have expected six years ago. Sevenpence a year per member enabled them to manage the organisation and to show a balance in the bank of more than a 600*l.*—*Birmingham Post.*

ST. JAMES'S-SQUARE.—We hear that the War Office authorities have taken as offices the upper floors of the building recently erected on the west side of the square, at the corner of King-street, by Messrs. Holloway Brothers, contractors, from the designs of Messrs. Rolfe & Matthews. The new edifice, erected in 1898-9, stand on the site of Cleveland House, which was pulled down in the winter of 1869-7, and had been occupied during a long period by the Duke of Cleveland, to whose estates Henry, Lord Bernard, succeeded after the death of the fourth Duke in August, 1891.

A RECORD OF THE PARIS EXHIBITION.—The volume dealing with the Paris Exhibition, which has been appearing in monthly parts in connexion with the *Art Journal*, has now been separately issued with a carefully compiled index. A considerable portion of the volume is devoted to reproductions of the work produced by the skilled manufacturers of the world, and there is ample material for critical comparisons of the artistic eminence of every country.

SANITARY CHRONICLES OF ST. MARYLEBONE.—The annual report of the Medical Officer of Health (Dr. Wynter Blyth) states that a recurring nuisance during the summer months is the non-removal of stable manure. The borough, owing to the extension of suburban districts, is continually being, as it were, removed farther and farther from the country districts, where the manure is required. The railway rates for such an article as stable manure are prohibitory, and at certain seasons it is only possible to get manure removed by paying a relatively high

price. It may, however, be stated generally that the stable manure was better and more regularly removed in 1900 than in any previous year.—The St. Marylebone Shelter, established for the purpose of receiving for short periods families temporarily turned out of their homes during the operation of disinfection, has been used ten times, and has afforded accommodation for seventeen adults and two children. During the year the medical officer has paid 460 first visits and 1,662 visits of re-inspection to workshops and laundry workshops. In the course of these visits he found several workshops which had not previously been visited by any inspector. The cubic measurement of each new workshop has been taken, and ventilation and sanitary conditions investigated before placing on the register. Improvement in ventilation has been effected in twelve workshops; three have been discontinued as unsuitable; ten gas stoves used for heating irons have been removed from the workshops or provided with means for carrying off the fumes generated. In three wash-houses a ventilating hood with a pipe fixed over the copper. Of the 1,318 workshops on the register, 1,004 are lighted by gas, 204 by electricity, and 110 by lamps. The more general adoption of electric lighting for workshops is hindered by the fact that gas has warming powers which electric lights have not. Dr. Blyth refers to the very harmful practice so much in vogue of warming the rooms by burning gas. He thinks that, in the interests of the workers, there should be a definite regulation that, should gas be used for warming purposes, it should only be through the medium of properly ventilated stoves.

METROPOLITAN PUBLIC GARDENS ASSOCIATION.—The eighteenth report of this Association states that the income of the Association during 1900 has amounted to 4,484*l.* 18. 6*d.*, against 4,865*l.* 13*s.* 1*d.* in 1899, showing a decrease of 381*l.* 12*s.* 5*d.* This is mainly attributable to the adverse effect of the war in generally diverting and lessening contributions. Since the commencement of 1900 the Association has laid out four new recreation-grounds, and has assisted in the formation of many others. Thirty-six new members have been elected, making a total of 870. Among the works carried out by the Association during the past year the following may be mentioned:—The Christ Church disused burial-ground in Blackfriars Bridge-road was laid out by the Association at a cost of about 400*l.* The parish churchyard of Plaistow, to which a valuable plot of adjacent land was added, has been laid out by the Association at a cost of 450*l.*, 10*0d.* of which was given by Mr. Threlfall. The Camberwell Vestry having secured a strip of vacant land in Sumner-road, it was laid out by the Association as a public playground at a cost of about 300*l.*, of which the Vestry paid half. When the last report of the Association was issued about 2,500*l.* was still required to make up the sum (50,000*l.*) needed for the purchase of the Dollis Hill estate. The whole of the ground has now been secured, the Association having paid over the sum, 519*l.* 11*s.*, collected for the purpose. During the year the scheme for acquiring the Alexandra Park and Palace for the public has progressed so favourably that the whole of the 150,000*l.* required has been collected. The size of the estate is 173 acres. It was found necessary to introduce a Bill into Parliament for placing the park and palace in the hands of trustees nominated by the contributing bodies. The Association took an active interest in the passage of this Bill, and secured important amendments therein for the free access of the public to all parts of the park. In regard to work in hand, the Association is laying out Leyton-square, Camberwell, S.E., as a public recreation-ground; and has promised to lay out, or to assist in laying out, if their maintenance is secured, Marian-square, Hackney-road; St. Giles' disused burial-ground, Hackney-road; the Swedish disused burial-ground, Prince's-square, E.; West-square, St. George-the-Martyr, Borough; Hoxton-square, the garden of the Wesleyan Church, Camberwell-road; and the eastern end of the Churchyard of St. Mary, Bow; and the southern portion of the Churchyard of All Saints, Poplar. The balance of the money collected for the purchase of the Golden's Hill Estate has been deposited with the Association. It amounts to 245*l.*, and forms the nucleus of a fund for any future extension of Hampstead Heath. The neighbouring property, known as Telegraph Hill, being for sale, steps are being taken towards its possible acquisition, and the Association is also inquiring into the question of the proposed electric railway under the Heath.

THE DUKE OF BEAUFORT'S MONMOUTHSHIRE ESTATES.—On March 26 and 27 current will be offered for sale by auction at Monmouth various properties situated in and around Monmouth belonging to the Duke of Beaufort. The several lots comprise the Duke's seat, Troy House, with 1,670 acres, upon the banks of the Wye and Trothy, and the ruins of Monmouth Castle. Amongst the many buildings in Wales and the borderland which are attributed to Inigo Jones is reckoned Troy Mitchell, near Monmouth, built shortly before his death in 1652, for Edward, second Marquis of Beaufort; confer Madden, "Privy Purse Expenses." Monmouth Castle, reputedly of Saxon origin, was rebuilt by William Fitz-Baderon, one of the Conqueror's followers; Edward I. erected the

Monks, Dixton, Wyebridge, and Over-Monnow-bridge gates, and rebuilt the castle walls. The honour, castle, and manor of Monmouth, with those of Lancaster, were bestowed upon the Earls of Gainsborough, one of whom, John of Gainsborough, lived there some while, and there his grandson, Henry V., was born. During the Civil War Sir William Waller captured the castle from Lord Herbert, who had garrisoned it for the King.

EXPENDITURE ON PUBLIC BUILDINGS.—The Lords Commissioners of his Majesty's Treasury have sanctioned the expenditure of the following items (subject to the approval of the House of Commons) on public works and buildings during the financial year commencing on April 1 next:—**Marlborough House:** Installation of electric light, on account, 1,000*l.* (total cost, 11,000*l.*); probable expenditure to March 31, 1901, 6,800*l.*; construction of scullery for guardroom, 300*l.*; warming enclosure at grand entrance, 150*l.*; Royal Mews, Pinlickie: New fittings and washing tanks, 450*l.*; warming large coach-house, &c., 100*l.*; Windsor Castle: Installation of electric light, further on account, 1,000*l.*; erection of permanent shelter for fire appliances, 150*l.*; construction of underground cellar at canteen, 125*l.*; Windsor Home Park: Alterations to lodge, Datchet-road entrance, 130*l.*; St. James's Palace (partly in occupation of his Majesty): Installation of electric light, on account, 1,000*l.*; preparation of Nos. 77 and 78, Pall Mall, for occupation as a Grace and Favour residence, in substitution for Bushey House, which is to be occupied as a National Physical Laboratory, 3,000*l.*; Kensington Palace: Completion of lightning conductors, 125*l.*; Hampton Court Palace: Re-erection of ornamental iron screens, 1,000*l.*; erection of sheds, fences, &c., 230*l.*; Hampton Court Gardens: Reconstruction of glass houses, 1,000*l.*; New Gardens: New pumping-house, mains, &c. (total, 2,575*l.*), on account, 600*l.*; annexe to Museum 3, 360*l.*; additional stabling (450*l.*), on account, 100*l.*; Temperate House, flag pavement, 100*l.*; ditto, soft water supply, 225*l.*; melon ground, new wall, 100*l.*; herbarium, new wing, on account, 500*l.*; Richmond Park: Public conveniences (600*l.*), on account, 250*l.*; Green park: Widening of Piccadilly (works within the park only), 500*l.*; Houses of Parliament Buildings: Providing water purifiers for steam boilers, 950*l.*; providing hydraulic lift for removal of ashes from boiler-room, 120*l.*; For the Gladstone monument (erection and erection) in Westminster Abbey, 2,100*l.*; For alterations and additions to Lambeth County Court, 1,200*l.*; British Museum: Improving the lighting of Ethnographical Gallery, 350*l.*; works and alterations of a minor character, 300*l.*; Natural History Museum: Further on account of the installation of electric light throughout the building (total estimated cost, 7,500*l.*), 500*l.*; adaptation of new room for taxidermist, 150*l.*; enclosing a portion of the open basement, 150*l.*; works and alterations of a minor character, 300*l.*; Science and Art Buildings, South Kensington: Erection of shed to protect blast and reverberatory furnaces, &c., 175*l.*; Custom House: Extension of refreshment room, 300*l.*; alterations to hydraulic lift, 175*l.*; erection of a new dwelling-house at the Customs Storage Depot (late Burning Ground), Rotherhithe, 650*l.*; erection of an office at Victoria Dock, 100*l.*; additions and alterations of a minor character at the Custom House and outlying offices, 300*l.*; Post Office.—General Post Office, West, additional space for cable and instrument work, 950*l.*; Mount Pleasant, enlargement of telegraph factory, Block E, 12,000*l.*; new sorting office at Clapham, 4,300*l.*; branch post office at West Brompton, 2,675*l.*; sub-district post office at West Kensington, 2,000*l.* (towards a total estimated cost of 18,325*l.*); Civil Service Commission, Burlington Gardens: For preparation and adaptation of the premises vacated by the London University for occupation by the Commission, 7,500*l.*; Duke of York's Royal Military School: For provision of a gymnasium, 5,000*l.*; Horse Guards: Conversion of residential rooms into office-rooms for Inspector-General of Fortifications, 1,150*l.*; Patent Office Extension: Acquisition of site and erection of buildings, 30,500*l.* (to complete the total estimated cost of 162,500*l.*); Royal Mint: For the erection of new die and medal department, 1,800*l.* (to supplement the 0,250*l.* already expended under this head); War Office, Winchester House: Alterations and re-arrangement for the accommodation of the Intelligence Department of the War Office, 5,500*l.*

PUBLIC CREMATORIA.—The Leeds City Council will promote a Bill in the course of the present session of Parliament, which provides for powers to make certain local improvements, at an estimated cost of 100,000*l.*, to include additional waterworks, a crematorium, and the acquisition of the house on the Harehills Estate, and the purposes of the Judges' lodgings. The Corporation of Hull have recently opened a crematorium at Hull that has been constructed at a cost of 2,500*l.*, and is, we believe, the first building of its kind erected by a municipal body in England.

CAPITAL AND LABOUR.

NORTH STAFFORDSHIRE BUILDING TRADE.—The annual report of the North Staffordshire Builders' Association, of which Mr. J. Bowden, Mayor of Burslem, is secretary, states that 95 per cent. of the builders in the district are members, all of whom

22,860.—SKETCHING-EASELS: H. W. Roberts.—The easel combining a carrying-rod, a board whereof the lower end fits against the body of the artist, and an upper sketching-board that a string loop joins to the carrying-rod. The board is held in its place with an eye screwed into the rod, and lies upon cord, webbing, or some similar support, so that the artist passes around himself and then secures to the carrying-rod.

22,884.—CONSTRUCTION OF FLOORS, WALLS, CEILINGS, &c.: F. Kemnitz.—A network of metal ropes or wires that are laced between hooks, eyes, or bent rods clamped on to the flanges of the standards or joists is embedded in concrete, cement, or artificial stone, provision being made for intensifying the tension of the wire network. For holding up the cement until it has become set boards may be dispensed with by laying wire netting, which has been coated with a compound of cow-hair, glycerine, and glue, beneath the tightened network.

22,895.—A CUTTER-HEAD FOR PLANING AND MOULDING OF WOOD: R. Perrin.—The cutter-head is fashioned with two transverse slots, in which the cutters of, say, a rotary planing machine are clamped with wedges that are pressed outwards with cutters tightened with nuts, which are held against the block by dovetailed flanges that do not impede their turning. If only one of the slots is thus adjusted a ring fence is attached to the head, the ring being held with pins clamped in the other slot.

22,895.—A FASTENING FOR WINDOWS AND DOORS: J. B. Podmore.—A plate, on to which an arm is pivoted, is fitted with a stay against the neck of which a projection impinges when one moves back the arm into its free position. For drawing the sashes into place one turns a thumbscrew, which is at the end of the arm, down on to a counter-sunk plate, which, however, can be discarded if the contrivance is used for fastening a door.

22,907.—LOCKS FOR DOORS: F. J. Gibbons.—For locks that have two differently-sized keyholes for masters' and servants' keys, as in an asylum or a similar building, the inventor attaches a long gating to one of the tumblers, so that when the door has been double-locked with the master's key the tumbler falls down and blocks the servants' keyhole. The use in the servants' keyhole of the master's key is prevented with collars upon the barrels of the key and external bosses upon the keyholes. The invention is claimed as being applicable alike for latch-locks, which are turned on one side of the door with a handle, and for dead bolt-locks.

22,938.—BORING AND SIMILAR MACHINES: R. Lang and W. B. Lang.—In order that the saddles of a horizontal boring-machine or a radial drilling-machine may be less liable to become twisted, the inventors provide guides upon one side of the carrying standard or frame; the bed-saddle and the spindle-saddle have side-bearings upon the corresponding edges respectively, and the saddles are retained upon the slides by the remaining other members of the frame.

22,997.—A WRENCH FOR PIPES, NUTS, &c.: W. H. Robinson.—The serrated stem upon which the adjustable jaw slides is made in one piece with the fixed jaw, and the former jaw is secured by two toothed dogs, the dogs being forced on to the stem with springs and lifted out of engagement with a stirrup. In order that they shall press against the adjustable jaw and so relieve the strain upon the pivot end, the dogs are shouldered near the pivot. An increase of grip is obtained with the turning of the wrench by means of the action of an inclined slide worked with a spring upon the face of the adjustable jaw. In another shape a plate having a bevelled stem projects from the movable jaw into the impulsion of a spring, and a spring dog is put in the jaw so that the dog will engage with the stem as the incline on the stem passes aside with the pressure of the jaw upon the work.

23,006.—CANS FOR WORKMEN'S USE: F. Böhm.—The can, devised for carrying and warming food, has an outer casing through which a lamp can be inserted from underneath, the opening may be closed air-tight if desired, with a slide. The trap is to be extinguished by turning a plate which will shut holes in the lid of the casing; and the lid of the can is fastened with a bayonet adjustment.

23,054.—A SAFETY APPLIANCE FOR HOISTS AND LIFTS: F. Eastwood.—A disc is fitted on to the upper end of a fixed cylinder whose other end is shut with a similar disc, and long links join the two discs together, the power being exerted in a line through the two discs. In order to ensure some amount of separate angular movement, each of the discs is keyed into the shaft with a wide keyway; as the load is ascending the discs fail to grip the cylinder, because during that time the connecting links are parallel to the shaft, but upon cessation of the power the upper disc becomes turned, by the load, in relation to the lower disc, whereby the links are inclined to one another and bring the discs into frictional contact with the cylinder.

23,066.—GULLY TRAPS: J. Place & Sons and W. H. Place.—In order that the capacity of the gully shall not be diminished, the inventors fashion the trap in one piece with a containing vessel or receiver; they also provide at the top an opening to serve for purposes of cleaning the trap.

23,113.—A WATER HEATER FOR DOMESTIC USE: T. P. Shaw.—At the lower end of the drum are a diaphragm and a casting in the shape of a ringed dish; the opening through the former is placed out of centre with the wall. There is also a flattened diaphragm, and the openings are joined with tapering and elliptical tubes respectively, the latter having ends with nipples. A block at the lower end of a tube, with passages through which water will drip from the top of the block, constitutes a water-trap for the casing. With the apparatus is recommended the employment of a movable gas-burner, from which the passage of the products of combustion may be controlled with dampers, expansion being met with a stuffing-box connexion upon the branch pipe.

23,141.—A SWITCHING CONTRIVANCE FOR USE WITH CRANES, HOISTS, AND OTHER LIFTING GEAR: G. Goddard.—The object of the invention is to provide means of exhausting the load to stop at any required point. By one method two sets of conducting strips are affixed on to the wall of the well in such a manner that the spaces of one set shall be opposite the strips of the other set, contact being made with a continuous conductor. Contact is made or broken by moving the handles of contact-levers or triggers that bear against the strips, or switches may be used for breaking contact. The cage has projecting levers to be struck by triggers or switches which are geared to the main switch, so that it may be kept "on" with an electro-magnet. At the breaking of circuit the switch is returned to the "off" position by a weight. With the specification should be read No. 5,423 of 1898.

23,157.—AN AUTOMATIC SPRINKLER: J. Bulcher.—For a system of sprinklers wherein an electro-motor controlled with a thermostat, regulates the supply of water. The sprinkling nozzle is set above a thermostat, which consists of a flexible chamber that will expand as the fire warms the air within it. As the thermostat expands, it closes an electrical circuit, which in starting the electro-motor opens a valve in the supply-pipe, whereupon an electro-magnet is excited to open the sprinkling-valve. The contraction of the thermostat, as the temperature falls, serves to close the circuit, and the valve upon the service-pipe becomes again shut through the further turning of a crank, which the electro-motor sets in motion.

23,211.—APPARATUS FOR BASCULE BRIDGES: J. P. Cowing.—The rollers, having various diameters, which support the flanged segmental end of the bridge are journaled in base-blocks upon the pier, and on the end of the bridge are segmental rails set in gear with toothed wheels that are driven with a motor and pinions; when the bridge is not being used the bridge and load are supported in part by skew-backs which are secured to the pier, when it is lifted upwards the end roller is stopped with a curved stopping-block; a counter-weight brings the centre of gravity of the bridge to the centre of the segmental end, being arranged in balance upon the opposite sides of a line or plane passing through the centre of gravity, and if the weight is partly without and partly within the segmental bearing surface it is taken by a recess formed in the pier; another form an endless chain is used for connecting the end rollers and in that case a rotary motion is communicated to the segmental end by means of frictional contact, the end rollers being driven with toothed gearing.

23,300.—AN APPLIANCE FOR MEASURING-INSTRUMENTS: A. A. Common.—For an exact adjustment of the line of collimation in the telescopes of measuring and similar instruments, the inventor has devised an eccentric ring which will turn an eccentric cell upon which he mounts the object glass. He also contrives that the eccentric ring shall turn in another ring around it so as to constitute an extension of the telescope; for an adjustment of the two rings he passes a Tommy through slots in the surrounding ring and thence into holes in the edges of the two rings, he provides a short tube to be fastened with a screwed ring as a covering for the slots after the adjustment has been completed.

23,319.—ELECTRICITY METERS: L. B. Atkinson.—The invention concerns current meters. A surrounding coil moves in a closed vertical glass tube a float, having a thin stem and containing an iron or steel wire. The float is weighted so as to maintain the stem in a vertical line, and air is introduced above the liquid—such as water or ether—with which the glass tube is partly filled. By another method the stem is placed downwards in two unmixable liquids within the tube. The invention applies to several modifications of the initial arrangements, including a bulb at the base of the glass tube for a correction of variations in density with temperature, as the expanding liquid effects a compensating rise of the level of the surface of the liquid; the use (for a liquid of water that has been saturated with ammonium sulphate or chloride, or other salt more readily soluble at increased temperatures, together with an excess of the salt within the tube) and the substitution for the float of a cylinder having flattened ends, in a coloured liquid, in order that a scale may indicate the position of either end of the cylinder. The appliance is described as being adapted for purposes of a maximum current indicator, and of measuring electro-motive force or current.

MEETINGS.

FRIDAY, MARCH 23.

Architectural Association Discussion Section.—Mr. S. L. Crasbie on "The Exhibition Cathedral," 7 p.m. Institution of Civil Engineers (Students' Meeting).—Mr. O. L. McDermott on "The Hunstet Railway, and Bridge over the River Aire," 8 p.m. Institution of Junior Engineers (Westminster Palace Hotel).—Engineering Question Night, 8 p.m. Institute of Sanitary Engineers (Incorporated).—Examination in Practical Sanitary Science.—Glasgow Architectural Association.—"Temporary Carriage Works," (1) Mr. R. Stuart on "Gabbert Sea-folds and Crane Seats"; (2) Mr. R. Wilson on "Centering"; (3) Mr. W. H. Baxter on "Temporary Stands," 8 p.m.

SATURDAY, MARCH 23.

Institute of Sanitary Engineers (Incorporated).—Examination in Practical Sanitary Science. Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "Sound and Vibration," V. 3 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Sewage Works, Sutton, 3 p.m. Edinburgh Architectural Association.—Visit to the Victoria Cabinet Works, Kircaldy. Dundee Institute of Architecture.—Visit to Baldovan Asylum.

MONDAY, MARCH 25.

Surveyors' Institution.—Adjourned discussion on Mr. Thomas Blashill's paper on "The Present Condition of the Building Industry," 8 p.m. Sanitary Institute.—Demonstration, for Sanitary Officers, of Bookkeeping as Carried On in a Sanitary Institution, Office of W. A. Taylor, 7 p.m. Society of Arts (Cantor Lectures).—Major Philip Cardew on "Electric Railways," III. 8 p.m.

TUESDAY, MARCH 26.

Sanitary Institute (Lectures for Sanitary Officers).—Professor Henry Robinson on "A Sewage Disposal," 8 p.m. Institution of Civil Engineers.—(1) Paper to be further discussed: "The Best Treatment of Bridge Structures," by Mr. Joseph Husband. (2, time permitting), Mr. E. Sandeman on "The Barrator Works for the Water Supply of Plymouth," 8 p.m.

WEDNESDAY, MARCH 27.

City of London College Science Society.—Mr. A. T. Walmisley on "Building Stones," 7.30 p.m. Builders' Foremen and Clerks of Works Institution.—Quarterly meeting of the directors, 8 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the East London Water Works, Lea Bridge, Clapton, 3 p.m. Society of Arts.—Mr. A. A. Johnston on "Clocks, Carillons, and Bells," 8 p.m. Institution of Electrical Engineers (Birmingham Local Section).—Mr. W. Wylde on "Polyphase Equipment in Factories," 7.30 p.m. Institution of Civil Engineers.—Students' visit to the Hford Sewerage Works and Sewage Disposal by Bacteriological Methods. Train from Fenchurch-street to Hford Station, 1.30 p.m. Edinburgh Architectural Society.—Mr. W. Scott-Morton on "Aids and Hindrances to Design."

THURSDAY, MARCH 28.

Society for the Encouragement of the Fine Arts.—Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. Sanitary Institute (Lectures for Sanitary Officers).—Professor Henry Robinson on "Scavenging, Disposal of House Refuse," 8 p.m. Institution of Electrical Engineers.—(1) Mr. H. W. Ravenshaw on "The Electrical Transmission of Power," (2) Mr. S. F. Walker on "Portable Electric Lamps," 8 p.m.

FRIDAY, MARCH 29.

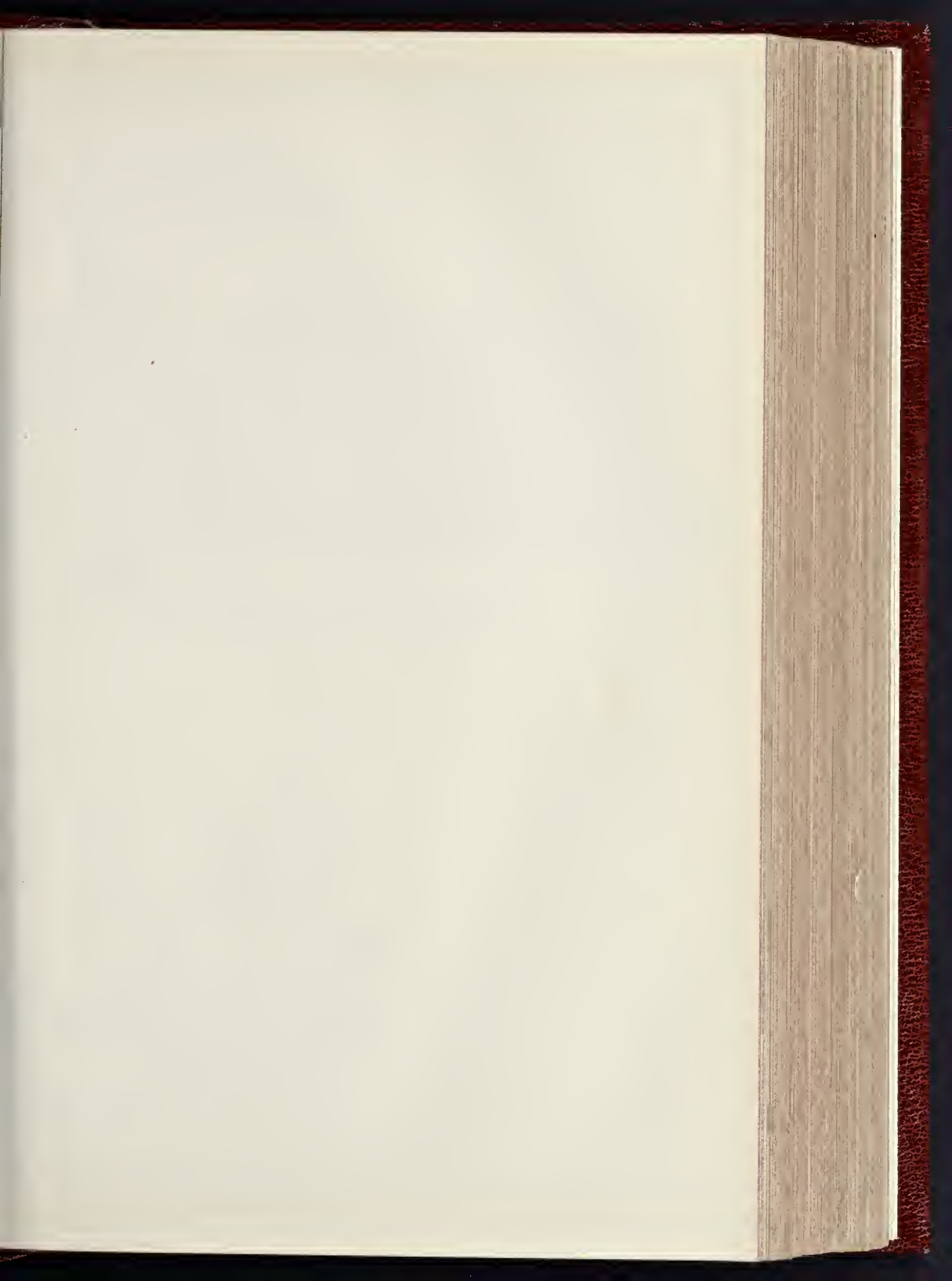
Architectural Association.—Mr. H. D. Seales-Wood and Mr. H. R. Appelbee on "Small Suburban Houses," 7.30 p.m.

SATURDAY, MARCH 30.

Architectural Association.—Spring Visit to the new buildings of the Prudential Assurance Company, Holborn Messrs. Alfred Waterhouse, R.A., and Lord, architects, 2.30 p.m. Royal Institution.—The Right Hon. Lord Rayleigh on "Sound and Vibration," VI. 3 p.m. Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Outfall Works, Barking, 3 p.m.

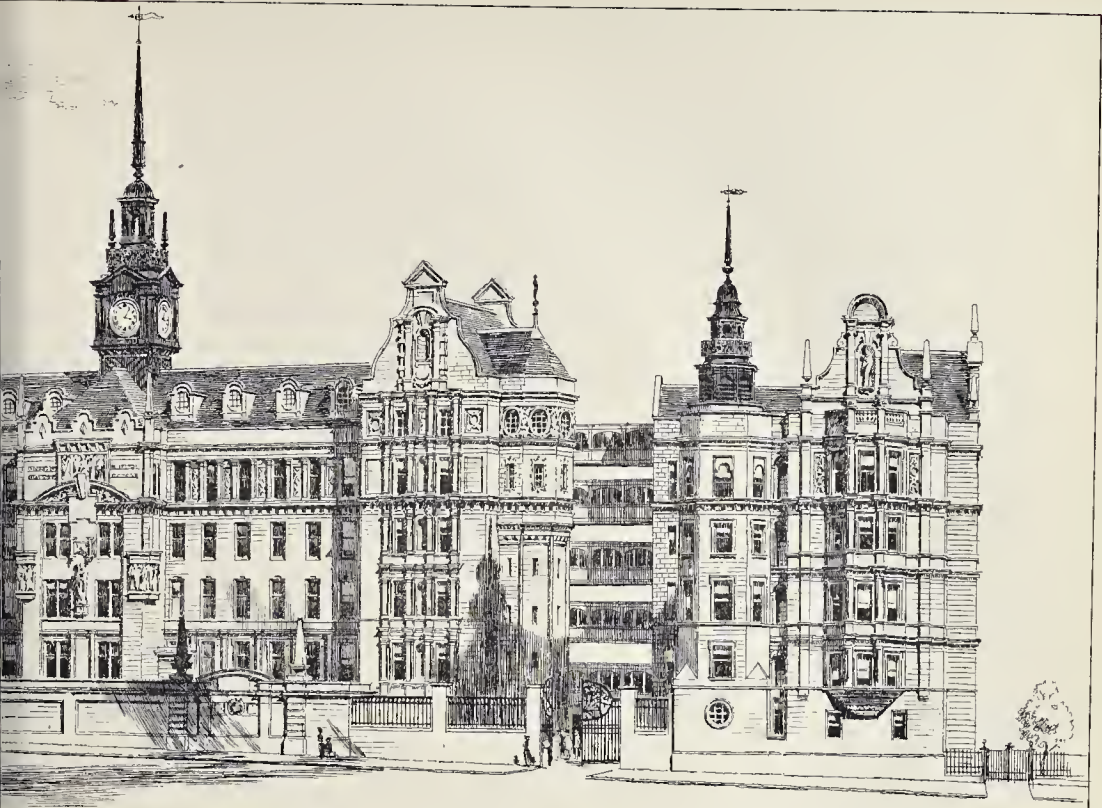
SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.
March 6.—By ASH & SCARFATT (at Stoke-on-Trent).
Milton, Staffs.,—Hawthorn Chemical Works, area 18 a. f. and c.
Chatterley, Staffs.,—Tunstall Chemical Works, area 27 a., u.t. 10 yrs., r. 36l. 38s.
Cheddler, Staffs.,—The Willowdale Farm, 17 a., u.t. 20 yrs., r. 100l.
Felt House Farm, 81 a., r. 4 p. f.
The Tunned Farm, 84 a., r. 27 p. f.
March 7.—By STEPHENSON & ALEXANDER (at Cardiff).
Llanishen, Glamorgan,—"The Hollies and 1 a., u.t. 75 yrs., g.r. 19l. 15s. 4d.
A freehold cottage.
Ely, Glamorgan.—Hardden and Boulton, 12 a., By THOMAS & BETTRIDGE (at Birmingham).
Neith, Whitacre, Warwick.—Boil's Green Farm, 157 a., r. 1. 32 p. f.
By J. A. C.
Bethnal Green.—212, W. Hance-rd., f. r. 56l.
89 and 497, Cambridge-rd., f. r. 100l.
Limehouse.—117 and 120, Coutts-rd., f. r. 52l.
Mile End.—92 and 94, West-st., f. r. 200l.
Victoria Park.—27, 31, and 33, Cadogan-rd., u.t. 49 yrs., g.r. 5l.
Stratford.—18 to 24 (even), Windmill-lane, and 9 to 23 (odd), Waddington-st., u.t. 49 yrs., g.r. 8l. 10s.





COMPETITION DESIGN FOR GLASGOW ROYAL



VIEW TO CASTLE STREET

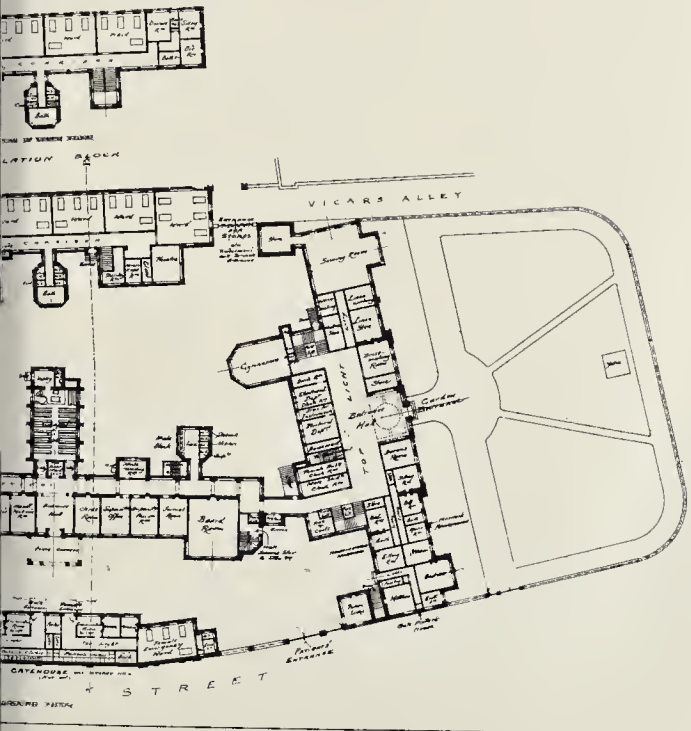
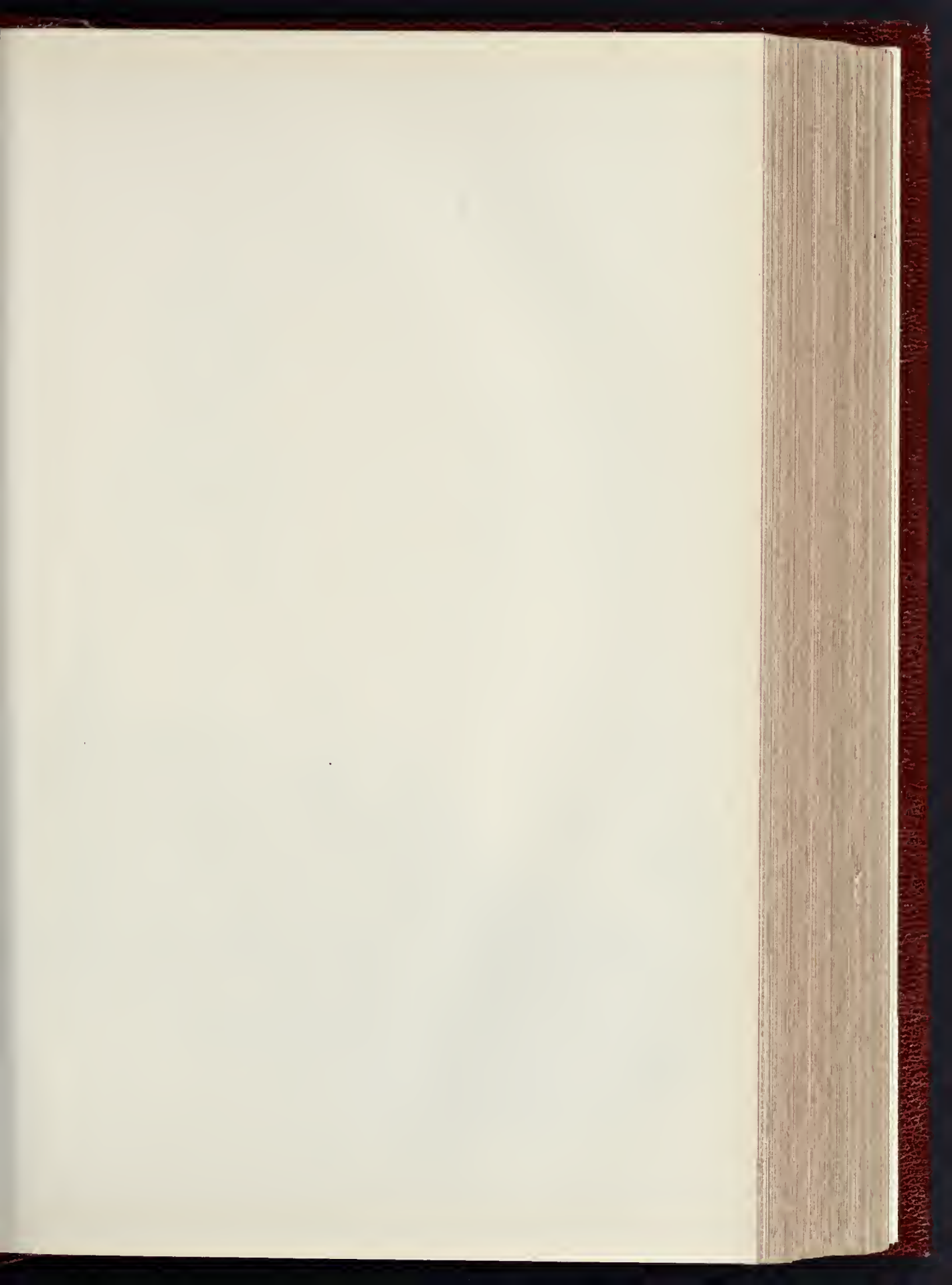


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MARY.—By MESSRS. MALCOLM STARK & ROWNTREE.



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CONTRACTS AND PUBLIC APPOINTMENTS.

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

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Coal and Coke	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	Mar. 26
Quartzite Road Metal	West Malling (Kent) R.D.C.	J. Marshall, surveyor, West Malling	Mar. 27
Alterations at Union Workhouse	Amphill Union	See Advertisement	do.
Road Works, Crescent-road	North-Eastern Railway Company	W. Bell, Architect, Central Station, Newcastle	do.
Shops, &c., Bishop Auckland	Burgess Hill (Sussex) U.D.C.	A. F. Hardwick, Church-road, Burgess Hill	do.
Road Works, Crescent-road	Blyth & Tyne Brewery Company	J. Potts & Son, Architects, 57, John-street, Sunderland	do.
Rebuilding the Briar Dene Hotel, Whitley	North Dublin Guardians	J. O'Neill, Union Offices, Dublin	Mar. 28
Additions to Workhouse, North Brunswick-street	Hackney Borough Council	Borough Engineer, Town Hall, Hackney, N.E.	do.
*Making-up Roads	Barton Regis R.D.C.	J. A. Henderson, Surveyor, Winterbourne Down	do.
Surveyor's Materials	Lichfield U.D.C.	W. Holt, Engineer, Council Offices, Lichfield	do.
Asphalt Works	Sale (Cheshire) U.D.C.	T. Bullock, Surveyor, Eglington	do.
Surveyor's Materials	Repton R.D.C.	H. Russell, 5, Market-street, Lichfield	Mar. 29
Sewerage Works	St. George-in-the-East Guardians	J. H. May, 249, High Holborn, W.C.	Mar. 30
*Nurses' Home	Brighton Borough Council	Borough Engineer, Town Hall, Brighton	do.
Motor Room, &c.	Batley Town Council	J. Russell, Civil Engineer, 22, Waring-street, Belfast	do.
Surveyor's Materials	Chew Magna (Bristol) School Bd.	W. E. Milton, School Board Offices, Chew Magna	do.
Business Premises, Whitehead, co. Antrim	Whitwood U.D.C.	A. Hartley, Surveyor, Castleford	do.
Additions to Schools	Rochford R.D.C.	H. Beswick, County Architect, Newgate-street, Chester	April 1
Road Works, Marchant-street, &c.	Basford (Notts) R.D.C.	F. Gregson, Council Offices, Southend	do.
Police Station, Wilmow, Cheshire	Newport (Salop) U.D.C.	S. Maylan, Public Offices, Basford	do.
Road Materials	Fulham Borough Council	See Advertisement	April 3
Sewers, New Cossall	Loughton U.D.C.	See Advertisement	April 6
Works and Materials	Bromley U.D.C.	T. Reid, Architect, Breda	April 8
*Sewerage Works	The Prison Board	Council's Offices, Bromley, Kent	do.
*Oranite	Lancashire Asylums Board	See Advertisement	April 10
Villa Residence, Brede, Sussex	West Suffolk County Council	F. Whitmore, Architect, Chelmsford	do.
*Road Materials	Madeira Estate Freeholders	Byfield & Son, 3, Stone-buildings, Lincoln's Inn	April 11
*Building Materials and Tools	Sevenoaks U.D.C.	T. Hennis, 6, DeLahay-street, Brighton	April 15
*Farm Buildings	Debyshire County Council	J. H. Manton, Architect, 32, Walbrook, E.C.	April 24
Police Station, Sudbury	Brighton Town Council	E. J. Tillstone, Town Hall, Brighton	April 26
*Villas Residences	Wrotham U.D.C.	H. P. Monckton, Architect, 32, Walbrook, E.C.	No date
*Stoneware Pipe Drain	Mrs. Heath	J. H. Mangan, Architect, Church-street, Kircaldy	do.
Police Station, Clowu	Mr. J. O. Walton	J. W. Godderidge, Architect, Tamworth	do.
Steelwork for Electricity Station	Tipton (Staffs) U.D.C.	J. E. Preston, Architect, 8, Allerton-terrace, Chapel Allerton	do.
*Isolation Hospital		T. B. Thompson, 15, Parliament-street, Hull	do.
Resecting St. Cuthbert's Church, Blackpool		W. H. Jukes, Surveyor, Public Offices, Tipton	do.
Tenements, &c., Bowhill, Cardenden, N.B.			
Schools, &c., Lowther-street, Kendal			
Two Villas, Trent Valley-road, Lichfield			
Two Houses, Shadwell-lane, Moor Allerton, Yorks			
Additions to 63 and 65, Spring Bank, Hull			
Surveyor's Materials			

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Islington Borough Council	£l. 10s. per week	Mar. 21
*Junior Clerk	St. Marpleton Borough Council	£58. per week	do.
*Surveyor	Isle of Thanet R.D.C.	200l. per annum	Mar. 22
*Clerk of Works	Swindon and Highworth Union	£3. 3s. per week	Mar. 30
*Clerk of Works	London County Council	£l. 13s. 6d.	April 1

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.

PRICES CURRENT (Continued).

WOOD.	At per standard.	
	£ s. d.	£ s. d.
Dry Walnut, American, per ft. sup. as inch	0 10 0	1 0 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 2 3	0 3 0
JOISTS, GIRDERS, &c.		
	In London, or delivered to Railway Vans, per ton.	
	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 15 0	8 15 0
Compound Girders	9 10 0	10 15 0
Angles, Tees and Channels, ordinary sections	9 7 6	11 7 6
Fitch Plates	9 15 0	10 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 5 0	10 0 0
METALS.		
	Per ton, in London.	
	£ s. d.	£ s. d.
IRON.—Common Bars	9 10 0	—
Staffordshire Crown Bars, good merchant quality	9 15 0	10 0 0
Staffordshire "Marked Bars"	14 10 0	—
Mild Steel Bars	9 10 0	10 10 0
Hoop Iron, best price	10 5 0	10 15 0
" " galvanised	16 0 0	—
(* And upwards, according to size and gauge.)		
Sheet Iron, Black—Ordinary sizes, 6 ft. by 2 ft. 3 ft. to 20 g.	10 15 0	—
" " 10 24 g.	11 15 0	—
" " 10 26 g.	13 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. 3 ft. to 20 g.	13 0 0	—
" " 22 g. and 24 g.	13 15 0	—
" " 26 g.	15 10 0	—

PRICES CURRENT (Continued).

METALS.	Per ton, in London.	
	£ s. d.	£ s. d.
IRON.—Sheet Iron, galvanised, flat, best quality—Ordinary sizes to 20 g.	17 0 0	—
" " 22 g. and 24 g.	17 10 0	—
" " 26 g.	19 0 0	—
Galvanised Corrugated Sheets—Ordinary sizes, 6 ft. to 3 ft. 20 g.	13 0 0	—
" " 22 g. and 24 g.	13 10 0	—
" " 26 g.	14 0 0	1 10 0
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	—
" " 22 g. and 24 g.	14 0 0	—
" " 26 g.	15 0 0	—
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	11 0 0	—
LEAD—Sheet, English, 3 lbs. & up.	16 0 0	—
Pipe in coils	19 0 0	—
Scal Pipe	19 0 0	—
ZINC—Sheet—Vieille Montagne	25 0 0	—
Silesian	24 10 0	—
COPPER—Strong Sheet	0 1 6j	—
Tin	0 1 2	—
Copper nails	0 1 2	—
BRASS—Strong Sheet	0 0 11	—
Tin	0 1 1	—
TIN—English Ingots	0 2 4j	—
SOLDERS—Plumbers	0 0 8j	—
"Tinmen's	0 0 8j	—
Blowpipe	0 0 9j	—

PRICES CURRENT (Continued).

ENGLISH SHEET GLASS IN CRATES.	
26 oz. thirds	43d. per ft. delivered
" " fourths	42d. " "
32 oz. thirds	54d. " "
" " fourths	51d. " "
Fluted sheet, 15 oz.	34d. " "
" " 21 "	42d. " "
" " 22 "	42d. " "
" " Hartley's Rolled Plate.	3d. " "
" " "	3d. " "
" " "	4d. " "
OILS, &c.	
Raw Lined Oil in pipes	per gallon 0 2
" " in barrels	" 0 2
" " in drums	" 0 2
Boiled " in pipes	" 0 2
" " in barrels	" 0 2
" " in drums	" 0 2
Turpentine, in barrels	" 0 2
" " in drums	" 0 2
Genesee Green English White Lead	per ton 25 10
Red Lead, Dry	25 0
Best Lined Oil Putty	per cwt. 0 2
Stockholm Tar	per barrel 1 10
VARNISHES, &c.	
Fine Elastic Copal Varnish for outside work	per gal. 0 10
Best Elastic Copal Varnish for outside work	" 0 10
Best Elastic Carriage Varnish for outside work	" 0 10
Best Hard Oak Varnish for inside work	" 0 10
Best Extra Hard Church Oak Varnish for inside work	" 0 10
Fine Hard Copal Varnish for inside work	" 0 10
Best Hard Copal Varnish for inside work	" 0 10
Best Hard Carriage Varnish for inside work	" 0 10
Extra Pale Paper Varnish	" 0 10
Best Japan Gold Size	" 0 10
Best Black Japan	" 0 10
Oak and Mahogany Stain	" 0 10
Brunswick Black	" 0 10
Berlin Black	" 0 10
Knottling	" 0 10
Best French and Brush Polish	" 0 10
ENGLISH SHEET GLASS IN CRATES.	
15 oz. thirds	21d. per ft. delivered.
" " fourths	24d. " "
21 oz. thirds	34d. " "
" " fourths	34d. " "

TO CORRESPONDENTS.

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

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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

Any communication to a contributor to write an article is given subject to the approval of the editor, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and of to the Editor.

LONDON.—For Muswell Hill Baptist Church and schools. Messrs. Geo. & Reginald P. Baines, architects, 5, Clement's-lane, Strand, W.C. :-

Table with columns: Church Estimate A, Upper part of Tower Estimate B, Gallery and Approaches Estimate C, Boundary Walls, Fences, and Gates Estimate D, Sawn hoarding on roof Estimate E, Total. Lists estimates for Smith & Son, V. Good, Gregar & Son, etc.

[Architect's estimate, £6,740.]

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

BRIGSTOCK, Northants.—For sinking a well, for the Irish Council. Mr. Beaby Thompson, F.G.S., Northampton, and Mr. John Chadwick, C.E., Bletchley:— Barlow .. £349 10 Siddons & Freeman, like & Ockenden 193 0 Oundle .. 149 16 M. Stone .. 185 8

ESHER.—For a private residence for Mr. T. Westray. H. Knight, architect:— Wheatley & Sons .. £3,200

HORNCASTLE (Lincs).—For the supply of granite and metal (5,975 tons), &c., for the Rural District Council. Mr. W. H. Holmes, Queen-street, Horncastle, and Henry White, Tumble Woodside, Mareham-le-Fen, Ston, Surveys:— Granite. Tons. Price per ton. s. d.

Table listing granite suppliers and prices: Ellis & Everard, Barton Hill; Whitwick Granite Co., Whitwick; J. & C. Wood, Boston; Forest Rock Granite Co., Whitwick; Grif Granite Quarry Co., Nuneaton; Groby Granite Co., Groby, Leices.

HULL.—For the erection of a warehouse, offices, &c., oil-plant. Messrs. Freeman, Son, & Gaskell, architects, 11, Carr-lane, Hull:— C. Greenwood, Hull .. £1,300 15 3

AMERICK.—For the erection of general offices and shops for the Irish Co-operative Agency Society, Limited. Brian E. F. Sheehy, C.E., architect, 50, George-street, Cork:— K. Keny .. £2,300 18 9 M. Gough, Lennedy .. 4,304 6 8 Coloney & Co., Lullin .. 2,355 0 0 Limerick .. £2,000 0 0

ANDON.—For alterations to Deacon's Tavern, brook, for Mr. T. Bartlett. Mr. Herbert Knight, architect and surveyor, 75, Aldermanbury, E.C.:- Nicks & Co. £635

ANDON.—For alterations to the Woolpack public-house, Moorfields, for Messrs. Worthington & Co. Mr. Knight, architect:— G. Kirby .. £247

ANDON.—For alterations, Tanswell-street, Lambeth, the Executors of the late Mr. E. Grove. Mr. H. H. Nicks & Co. £760

ANDON.—For a block of offices, Lloyd's-avenue, H. Knight, architect:— Brad, Pater & Co. £16,500

ANDON.—For decoration and general repairs to St. John's High-road Congregational Church and its site. Messrs. George Baines, & Reginald Palmer, architects, 5, Clement's-lane, Strand, W.C.:— R. Zepher .. £799 15 0 A. Collins .. £1,121 15 6 Collingwood & Co. 569 13 0 Tolness .. 845 0 0

ANDON.—For the new children's homes, for the infants of Greenwich Union:— Rowbotham, Birmingham .. £107,777

LONDON.—For the extension and completion of the infirmary in Brunswick-square and Havel-street, for the Guardians of St. Giles, Camberwell. Mr. Edwin T. Hall, architect, 57, Moorgate-street, E.C.:-

Table listing London infirmary estimates: Allan & Son, Willcock & Co., Willmot & Sons, Johnson & Son, Gough & Co., Shillito & Son, Balaugh Bros., Kingierlee & Son, Foster & Dicksee, H. L. Holloway, Charles Wall, Holliday & Green-wood.

LONDON.—For rebuilding, after recent fire, also alterations and additions to Annato Works, Beveden-street, Hoxton, N., for Messrs. Fullwood, Bland, & Hurrant. Mr. W. F. Potter, architect. Quantities by Mr. C. R. Griffiths, 4 and 5, Warwick-court, Gray's Inn, W.C.:-

Table listing London rebuilding estimates: R. E. Nightingale, Grover & Son, Lawrence & Sons, C. P. Roberts, Ashby Brothers, G. Challis, F. Dawes, Maskall & Son.

LONDON.—For repairs and decorations to 55, Brecknock-road, London, N. Mr. E. G. Salter, architect and surveyor, 13, Phoenix-street, St. Pancras:—

Table listing London Brecknock-road estimates: Geo. Cox, W. Easun, Lavin Bros., Marchant & Hirst.

MALLOW (Ireland).—For the construction of bridges, &c., for the District Council. Mr. S. A. Kirkby, County Surveyor, Cork:— William Macarthy, Stuanhill, Doneraile .. £224

SHILLLAGH (Ireland).—For the erection of labourers' dwellings at the following places for the Rural District Council. Mr. J. J. O. Ramsay, C.E., Dunlavin, co. Wicklow. Quantities by the architect:—

Table listing Shilllagh estimates: Thomas Murray, Cronela, Shillelagh, Barnanuinga, Thomas Murray, Cronela, Shillelagh, Ballynavortha.

James Doyle, Lancy, Ardattin, Tullow .. 137 0

Stephen Brennan, Newtownbarry .. 135 0

Stephen Brennan, Newtownbarry .. 135 0

Patrick Neill, Knockeen, Tullow .. 266 0

Patrick Neill, Knockeen, Tullow .. 134 0

Richard Carey, Coolroe, Tinahely .. 110 0

James Doyle, Askakee, Ballinglen .. 260 0

James Doyle, Askakee, Ballinglen .. 128 10

Edward Boulger, Tinahely .. 136 10

Edward Boulger, Tinahely .. 136 10

Daniel Brennan, Carnw .. 140 0

Daniel Brennan, Carnw .. 140 0

Daniel Brennan, Carnw .. 140 0

Edward Bowes, Shillelagh .. 135 0

Denis O'Brien, Curranavish, Tinahely .. 135 0

NOTTINGHAM.—For making alterations and additions to factory in rear of Harley-street, New Lenton, for conversion into a laundry, for the Standard Steam Laundry, Limited. Mr. Fred C. Martin, architect, Angel-row, Nottingham:—

Table listing Nottingham laundry estimates: S. Thumbs, J. H. Vickers, Ltd., Wm. Maule, Williamson & Co.

SPILSBY (Lincs).—For the supply of broken granite and slag (16,000 tons), for the Rural District Council. Mr. T. A. Busbridge, C.E., District Surveyor, Spilby:—

Table listing Spilby granite and slag estimates: M. Jackson, River Head, Louth; J. & C. Wood, Market-place, Boston; The Groby Granite Company, Ltd.; Forest Rock Granite Company, Ltd.; Whitwick, Leicester.

Grimley & Co., Sutton Bridge, Wisbech .. 8 6 8

The Islip Iron Company, Ltd., Islip .. 8 2 8

The Holwell Iron Company, Ltd., Asfordby, Melton Mowbray .. 6 9 6

[The prices stated here are the average prices per ton.]

TWICKENHAM.—For the execution of street works, Norman-avenue and St. Stephen's gardens, for the Urban District Council. Mr. F. W. Pearce, surveyor, Town Hall, Twickenham:—

Table listing Twickenham street works estimates: Fry Bros., Kavanagh, Swaker, R. W., Wimpey & Co., Ballard, Adams, Soan, A. C., Free & Sons, Mowlem & Co., Benham & Co., Sireatham Hill.

WALTHAMSTOW.—For the erection of four shops and offices, Wood-street and Wyatt-lane, for the trustees of the Walthamstow Parochial Charities. Mr. W. A. Longmore, architect, Bridge Chambers, Hoe-street, Walthamstow:—

Table listing Walthamstow shops and offices estimates: F. Parsons, West Bros., Pettit, Reed, Barton, A. W. Robinson, R. & E. Evans, Silk, Hood, Sands Palmer, & Co., T. & W. Baker, Ridgeway & Sons, Penn, Dean.

WANSTEAD (Essex).—For the construction of septic tanks, for the Wanstead Urban District Council. Mr. J. T. Bresse, Surveyor:—

Table listing Wanstead septic tanks estimates: H. Payne, J. Burrell, S. Saunders, Foster Bros., John Jackson, W. & C. French, Griffiths & Co., Johnson & Son, Adams, Cliff Ford, G. Bell, Tottenham Hale, Tothenham, Wilson, Border, & Co.

WANSTEAD (Essex).—For the erection of boundary walls and fencing at the Wanstead Park Board school site. Mr. John T. Bresse, architect and surveyor, 70 and 71, Bishopgate-street Within, E.C.:-

Table listing Wanstead boundary walls estimates: Cross & Cross, Sandys, Palmer & Co., Priest & Son, Ltd., Chas. North, Harris & Wardrop, Baker & Co., James Catley, W. H. Crosse, F. W. Hazzard, Alfred Reed, Palmer & Co., Thomas & Edge, A. W. Robins, J. & J. Jones, Joseph Jackson.

[See also next page.]

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

* Recommended for acceptance.

BRACKENBURY-ROAD.—Erecting special school for sixty children; removing covered playgrounds, and providing new playgrounds:—

Treasure & Son	£4,280 0 0	Wall & Co.	£3,906 0 0
Simpson & Son	4,096 0 0	Lathey Bros.	3,916 0 0
Leslie & Co., Ltd.	3,994 1 8	Patman & Fotheringham, Ltd.	3,885 0 0
Gough & Co.	3,992 0 0	E. Triggs	3,843 0 0
Laurance & Sons	3,970 0 0	C. Wall	3,830 0 0
		Simpson & Co.	3,740 0 0

BRUNSWICK-ROAD (Day Industrial School).—Providing and fixing additional boiler (steam), cooking range and other apparatus in kitchen, drying apparatus, disinfecting oven, gas copper in laundry, hot-water services to baths, spray lavatory ranges and scullery sinks, steam pipes to washing tubs, rearranging and altering existing low-pressure hot-water apparatus to suit the alterations in rooms, including all builder's work in cutting away and making good:—

Brightside Foundry and Engineering Co., Ltd.	£1,598	C. & E. Bradley	£1,700
Wippell Bros. & Row	1,450	J. & F. May	1,095
F. Grundy	1,323	Cannon & Sons	1,085
Oldroyd & Co., Ltd.	1,172	Wontner & Smith	1,050
J. Esson	1,170	Gray & Co.	1,050
J. C. Christie	1,160	Wenham & Waters, Ltd.	920

CALVERT-ROAD.—(Infants' Enlargement and Improvements).—Removing existing cloakroom, staircase, teachers' room, water-closet, &c.; providing hall, 54 ft. by 21 ft. (average); providing two new classrooms for sixty and fifty, new cloakroom and teachers' water-closet; dividing classroom and altering stepping, &c.; forming skylight in existing classrooms; and converting school-keeper's old rooms into teachers' room and stockroom. Revised accommodation, 380; net gain, thirty-five:—

Wall & Co.	£3,275	J. & C. Bowyer	£2,968
Johnson & Co.	3,059	J. Appleby	2,900
F. & H. F. Higgs	3,043		

EFFRA-PARADE.—Painting interior and exterior:—

H. & G. Mallett	£603 0 0	Maxwell Bros., Ltd.	£467 0 0
Carrett & Son	551 0 0	Holliday & Greenwood	447 0 0
Rice & Son	515 0 0	E. Triggs	396 0 0
Bulled & Co.	511 0 0	W. Smith	383 14 2

LEWISHAM BRIDGE.—Rebuilding offices, extending and altering urinal, refitting the lavatories, and providing new drainage scheme:—

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ILLUSTRATIONS.

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Presbyterian Church, New Haven, Connecticut, U.S.A.—Mr. F. R. Constock, Architect	Two Single-Page Photo-Lithos.
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Premises, Hunslet, Leeds; and Pribrises, Thirsk.—Messrs. Bedford & Kitson, Architects	Single-Page Tone Block.

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The Port of Bristol.



In spite of the maritime adventures and pursuits with which Bristol is associated, its geographical position is hardly one that would be chosen in the present day as the site of a great seaport. Yet the place, at the confluence of two rivers and within a few miles of an important estuary, is admirably adapted for the establishment and growth of a city. Bristol was probably best known as a fortified place in the earlier stages of its existence; then, as England gradually ceased to be the happy hunting-ground of peace and warlike seafarers from abroad, and the country itself began to settle down to more or less peaceful avocations, it became celebrated as a notable port, as well as a great commercial centre. Originally merely a hamlet in the Royal Manor of Barton, Bristol grew to be a county, and later a city. From the twelfth to about the middle of the eighteenth century it was undoubtedly, next to London, the most populous and the most important port in the whole kingdom. So far as respects to shipping, it also occupied the second position until outstripped by Liverpool, and since that event it has fallen to a much lower place. Probably in no other city have the physical features been so completely altered as in Bristol. Of the two rivers by which it was once almost encircled, the Frome, after being transferred to a new channel, has practically disappeared, and the Avon passes through the city in an artificial channel, the old course having been absorbed in the construction of the city dock, known as "The Float" or the "Float-Harbour." The original courses of the two rivers may be traced on plan No. 1, which represents the city about the year 1600. In the earlier part of the twelfth century it was described as almost the

richest city in the kingdom, for ships brought into it both home and foreign merchandise, it stood in a specially fertile district, and had the strongest site of any city in England. The same account goes on to say that twice in every twenty-four hours the waters of both rivers were turned back by a "quick and strong tide," so that a deep harbour was made, such as would receive a thousand ships, while the whole city seemed to "float on the waters, and to be seated on their banks." Although this language may be somewhat imaginative, and as to the last two similes a little contradictory, yet it must be clear that even at that early date both the city and the port gave evidence of considerable commercial prosperity. Until the year 1248 the only harbour was in the Avon, and the rapid ebb of the tide left vessels stranded on the bed of the river, thus frequently resulting in injury by straining action which they were not calculated to withstand. For the purpose of improving matters the citizens purchased a portion of the Canon's Marsh through which they cut a new channel, as shown on plan No. 2, this cut remaining almost unaltered to the present day, as a branch of the floating harbour. The old channel was filled up, and the completion of the undertaking—providing what was then thought to be a good harbour and quay—constituted the first real attempt at dock improvement in the Port of Bristol. This work is said to have cost the sum of 5,000*l.*, the equivalent of which is now variously estimated at anything between 25,000*l.* and 125,000*l.* Soon afterwards a new stone bridge was built connecting the northern and the southern parts of the town, and during the construction of the bridge the Avon was temporarily diverted through a new channel marked on the plan, the course of the cut being partly indicated in modern Bristol by the street known as Port Wall. A considerable enlargement of the walled area of the city was the result of these undertakings, and for the next few years there can be no doubt but that the building trades must have experienced a period of remarkable activity. Although

no radical alterations were made in the form of the harbour for several centuries, the prosperity of Bristol continued to grow year by year. About 1450, William Canynge, one of the merchant princes, had nine ships afloat, and employed 800 seamen, besides 100 carpenters and other workmen; whilst a merchant named Strange is said to have owned about twelve ships.

In 1735 Bristol was described as a densely populated city, the quay along the old wall being crowded with houses on both sides; and in the middle of the street, as far as could be seen, hundreds of ships, their masts as thick as they could stand by one another. Up to this time Bristol had things pretty much her own way, in spite of the harassing and restrictive policy of the Corporation and society or company known as the "Merchant Venturers." This body, working hand in hand with the Corporation, farmed the port dues, wharfage and other charges, whilst the city authorities, in a jealously conservative spirit, excluded all except freemen from trading, and did everything in their power to confine the shipping industry within the city boundaries. In earlier times, vessels engaged in trade were of light draught and insignificant dimensions; consequently access to the quays of Bristol was unattended by serious difficulties, although much delay and inconvenience was caused by the violent character of the tidal flow and ebb. About the middle of the eighteenth century, formidable opposition from other ports commenced, and a period of decline was entered. Partly owing to the natural disadvantages of the port, and partly in consequence of excessive local rates, a large portion of the West Indian trade was permanently diverted from Bristol, and further, loss of trade was experienced after the opening of canal communications between the Midland counties and ports less affected by tidal irregularities and more readily accessible from the sea. Then also the tonnage of vessels began to increase, a circumstance which tended still further to diminish the popularity of the western port.

Ever since the beginning of the nine-

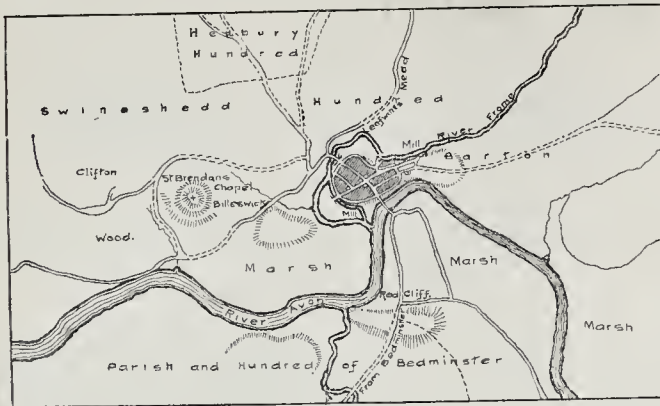


Fig. 1.—Plan of Bristol. A.D. 1066.

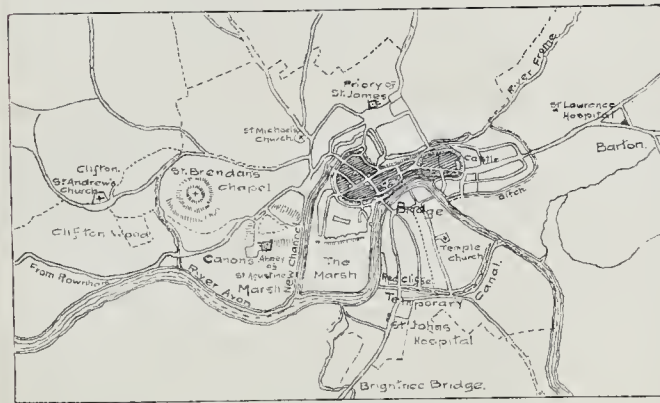


Fig. 2.—Plan of Bristol. A.D. 1250.

teenth century Bristol has been struggling to keep pace with the growing demands of the shipping trade, but with very indifferent success. Before the construction of the city docks, the accommodation was not essentially different from that made by the citizens in the year 1248, although improved quays and various facilities had been added from time to time. By a happy inspiration, it seems to have occurred to some one, about the year 1800, that the river harbour was really five and a half centuries behind the times. Consequently a Dock Company was formed in 1803 for the purpose of making an enclosed harbour in which vessels might float at all times without being thrown on their beam ends at the ebb of every tide. On June 1, 1804, the city harbour was commenced, being completed in 1809, at a total cost of 600,000*l.* The works comprised the building of new bridges; the formation of an artificial channel for the Avon from Totterdown to Rowham; the conversion of the Frome and Avon into a "floating harbour" by embanking and locking the old river courses; and the construction of Bathurst Basin, which, it will be seen by a comparison of Plans 2 and 3, occupies the site of the pool formerly existing near the outfall of the stream passing through Bedminster. Various additions were made in succeeding years, and in 1822 an Act was obtained for further improvements. Unfortunately the advantages

of these works were lost by mismanagement; the Dock Company was practically controlled by the Corporation and the Merchants' Venturers, who sought profits from high rates rather than from the expansion of trade. In 1825 some of the more oppressive dues were modified, but no real reforms were introduced until 1848, when—largely owing to the efforts of the Chamber of Commerce—the dock undertaking was purchased by the Corporation, and the port dues were at once reduced to more reasonable proportions.

The credit of originating trans-Atlantic steam navigation in 1838 was due to the Great Western Steamship Company of Bristol; but their great mistake was in attempting to establish a line of steamships with only one vessel. Liverpool at once followed with a fleet of four large steamers, securing the mail contract, and becoming the principal port for communication with the new world. The inadequate nature of the Bristol dock in 1844 is shown by the fact that when the Great Western Steamship Company had built a second vessel—the unfortunate *Great Britain*—she was too large to pass out into the river until the lock had been increased in size. Notwithstanding the unsuccessful attempt to establish regular trade with America, the general prosperity of the Port of Bristol continued to increase, and the improvement of dock accommodation became a matter of urgency. Various projects were discussed

from time to time, and about the year 1850 the Corporation came to the conclusion that the dockisation of the river was the best means for developing the port. Just as their forefathers tried to crowd all trade into the narrow limits afforded by the city walls and to conserve its benefits for a favoured few, so did the authorities at the time of which we speak propose to bottle up the Avon with the idea of obtaining the greatest possible benefits for the city from such ships as might be induced to enter the river. The object of the Corporation was a strictly proper one, but the means suggested for its attainment resulted from a mistaken policy, which, being perpetuated up to recent times, has done much to restrain the progress and prosperity of the port. In 1859 the first scheme for dockisation was prepared by Mr. Howard, the docks engineer. This proposal was submitted to Sir John Hawkshaw and Mr. Page, but, after consideration, it was disapproved, chiefly because a prejudicial effect on the anchorage of King Road was feared by those experts.

A few years later, a movement was made for the construction of a deep-water dock at Avonmouth, a scheme in which Sir John Fowler and Mr. Brunlees were professionally interested. At last, in 1877-80, the present Avonmouth and Portishead Docks were constructed, each by a separate company; and about the same time a considerable sum of money was expended by the Corporation on the improvement of the city docks. The three extensions proved of general benefit, but the city then became only one, and the much heavily handicapped, of three competitors for the profits to be derived from the shipping industry. This condition was terminated when, under "The Bristol Dock Act, 1884," the Corporation purchased the undertakings of the Bristol Port and Channel Dock Company, of the Bristol and Porthead Pier and Railway Company, and of the warehouse companies both at Avonmouth and Portishead. Two years later the Corporation obtained powers for making a new entrance lock to the Avonmouth dock, a new dock and graving dock communicating therewith, as well as some additional works in the floating harbour. Further Dock Acts were passed in 1893 and 1894 authorising various works and improvements in the city docks; but the scheme which it is now hoped will enable Bristol to compete successfully with other ports in the Channel, has only recently been formulated, and is the final outcome of successive proposals brought forward at different times during the last decade. When the late Mr. McKerrich, then the docks engineer, commenced the preparation of his scheme in 1894, the condition of the docks generally was not essentially different from that existing in 1884 although some of the improvements authorised had been added. The city docks included an area of about 80 acres, and there were three dry docks varying in length from 300 ft. to 380 ft., width from 38 ft. 6 in. to 45 ft., and in depth from 13 ft. to 15 ft. The entrance to the opening into the Cumberland Basin measured no more than 350 ft. long by 62 ft. wide. Avonmouth the main dock covered an area of about 16 acres; it was provided with a floating dry dock, of the pontoon type, about 350 ft. long; and the entrance lock measured 454 ft. long by 70 ft. wide, the depth of water on sill at ordinary spring tides be-

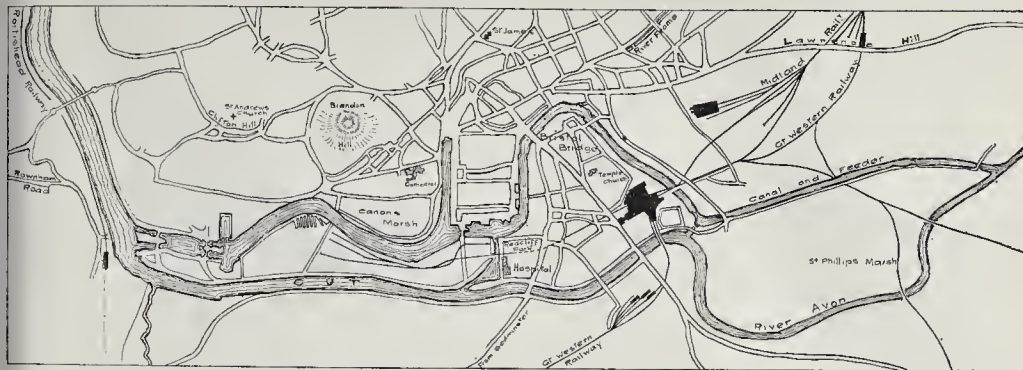


Fig. 3.—The Port of Bristol (City Decks). A.D. 1901.

8 ft., or at lowest neap tides 27 ft. The lock at Portishead, approximately equal in area to the Avonmouth Dock, was provided with a lock 444 ft. in length by 66 ft. in width, the depth of water on sill at ordinary spring tides being 33 ft. and in the dock 7 ft. A detailed consideration of the proposals put forward by Mr. McKerrich in 1894 is not necessary, but it may be useful to observe that they were to some extent based on conditions which have since been modified, and although providing for dockisation in accordance with the instructions of the Corporation, they included the construction of a large new dock at Avonmouth, with a graving dock, an entrance lock of ample size, and a low-water passenger pier. It was also pointed out by Mr. McKerrich that works of considerable extent would be required for dealing with sewage in the event of the river being docked. In the following year Sir John Wolfe Barry was invited to report upon these recommendations, and in his modified scheme of 1896 some alterations and additions were suggested. The net cost of dockisation was then estimated at £1,880,000, the low-water pier being estimated at £320,000, and the sewage works at £500,000. Sir John Wolfe Barry also considered the whole subject of harbour accommodation, and reported on three alternative methods of dealing with Transatlantic traffic; these are stated below with the estimated total cost of each, including wharf and other auxiliary works, but not a low-water pier or sewage works:—dockisation, £2,580,000; improvements at Avonmouth, £1,308,000; improvements at Portishead, £852,000.

When reporting upon the dockisation scheme Mr. McKerrich expressed the opinion that the Avonmouth improvement was to be preferred, but at that time Sir John Wolfe Barry was rather in favour of extensions at Portishead. No result followed the presentation of these reports, until in July, 1898, the Dock Committee decided to recommend the expenditure of £350,000 on the development of the Portishead Dock; and in the same year a decision was added to the Avonmouth lock, making it available for ships up to 480 ft. in length. Nothing further appears to have happened until October, 1898, when it was decided by the City Council that a special committee should be appointed to report within three months "as to the lowest possible cost at which the River Avon can

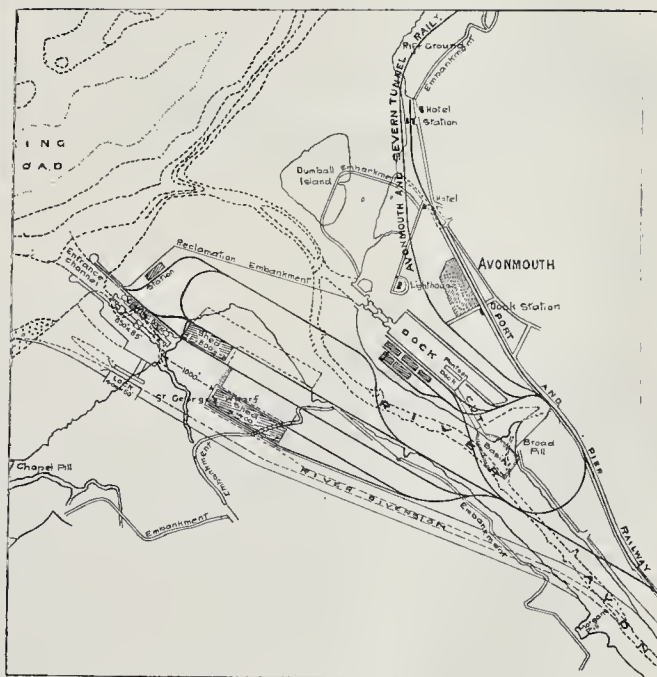


Fig. 4.—The Port of Bristol (Avonmouth Dock). Dockisation Scheme of 1900.

be docked, and accommodation be provided for the largest class of passenger and cargo steamers." A final report was made by the Docks Engineer in December, 1898, in which the total cost of the works was estimated at £1,782,000, but the progress of events was once more interrupted, this time by the regrettable death of Mr. McKerrich in January, 1899. Then in July, 1899, the Dockisation Committee requested the new Docks Engineer, Mr. W. W. Squire, and the general manager, Mr. Girdlestone, to report upon the recommendations of Mr. McKerrich. In the early part of October, 1899, the Dock Committee of the City Council appeared intent upon the Portishead extension, but at the same time they invited Sir John Wolfe Barry, Sir Benjamin Baker, and Mr. Hurtzig to consider the whole subject of dockisation in conjunction with Mr. Squire. The report presented by these eminent experts in May, 1900, makes it clear that dockisation is prac-

ticable as an engineering work, but it also hints at the grave objections which might be raised in connexion with any application to Parliament for powers to dockise the Avon. Amongst these objections two of the most important are—(1) interference with the drainage of some 900 square miles of country, and (2) restriction of the flow and ebb of the tidal volume of the river, with the possibility of prejudicially influencing the estuary in general and the anchorage of King-road in particular. As to the most suitable position for dock accommodation, the report says it would be difficult to prove that this should be provided in the heart of the city, and points out that without ruinous demolition of property it would be impossible to furnish facilities there for dealing with large vessels within the limits of time usual in competitive ports. Moreover, the doubt is expressed whether large vessels would readily undertake the up river journey, even if the accommodation



Fig. 5.—The Port of Bristol (Avonmouth and Portishead Docks). Dock Extension Scheme of 1901.

were provided at the city docks. A general representation of the dockisation scheme is to be found in plan No. 4, and it will be observed that the main idea is to afford ample provision at Avonmouth for large steamships, whilst the dockised river is regarded chiefly as furnishing an improved means of access to the city itself. The details of the proposal were as follows:—

1. A diversion of the Avon from below Pill Ferry to a new outfall, the new channel being about two miles in length and permitting the passage of three steamers abreast, drawing 23 ft. at neap tide, high water.

2. A reclamation embankment, about one mile in length, from the entrance lock of Avonmouth Dock to the northern side of the new outfall. This embankment would provide a new site of about 300 acres for dock and auxiliary purposes.

3. An entrance channel from King-road; an entrance lock, 850 ft. long by 85 ft. wide; and a graving dock of similar length.

4. A deep-water dock of 23 acres, and dock space in the river of 10 acres; 3,000 lineal feet of deep-water quays, shed area of 525,000 square feet, and other equipment.

5. A masonry dam across the diverted river, with large under sluices worked by machinery, and having an opening of 2,000 square feet.

6. Railway communication with the Port and Pier and the Severn Tunnel Junction railways, railway sidings to the length of 20,000 lineal feet, and a passenger station near the entrance channel.

7. An independent lock entrance into the dockised river for small vessels.

The cost of these works was estimated by the engineers at 2,775,000*l.*, this sum

being an advance of about 700,000*l.* on the amount suggested in 1896 by Sir John Wolfe Barry, but the difference was largely owing to the proposed river diversion.

A part of the report which is of permanent value is that referring to the increased cost of dredging necessitated by any scheme of dockisation. The calculations given in the report are based upon actual results obtained during recent years, and upon the undoubtedly correct assumption that the solid matters brought down from the Avon watershed would be nearly all deposited in the relatively still water of the dockised river, instead of being carried into the estuary, as at present. Making due allowance for the weight of material now removed, it appears that the additional expense for dredging entailed by dockisation would not be less than 29,000*l.* per annum.

It is highly probable that the report of 1900 had the effect of strengthening the hands of those who were opposed to the idea of turning the Avon into a ship canal; but the advocates of dockisation were by no means convinced of error, for on July 30, 1900, it was decided by the City Council that yet another report should be made by the Dockisation Committee, after consultation with Sir John Wolfe Barry, Sir Benjamin Baker, and Mr. Hurtzig. These eminent engineers were also to be requested to present another proposal which in their opinion would be adequate to the requirements previously stated, and would give equal accommodation to that in the dockisation scheme. The proposal was presented in due course, and an opinion was also given adverse to dockisation, not because it was impracticable, nor because of the greater outlay involved, but chiefly on account of various important questions

which in their opinion would constitute obstacles to the success of any application to Parliament for dockisation of the river. This dictum had the effect of setting dockisation definitely aside, and selection had then to be made between the Portishead extension favoured in 1896 by Sir John Wolfe Barry, and the Avonmouth extension, recommended in the final report made in October, 1900, by the three experts. With regard to the former proposal, it may be mentioned that Sir John Wolfe Barry has stated that in 1896 he was influenced by the belief that Bristol then especially desired accommodation for Atlantic liners rather than a general development of the port. Further, it is perfectly clear that the railway communications of Portishead are very inadequate, and no extension is to be recommended at that place unless accompanied by a thoroughly satisfactory understanding with the two great railway companies. At the present time Sir John Wolfe Barry is entirely in accord with his colleagues in recommending the Avonmouth site. As the matter now stands the Corporation has decided to adopt the proposals made in the October report, and these have already been included in a Bill, known as "The Bristol Docks and Railways Act, 1901," to empower the Mayor, aldermen, and burgesses of the city of Bristol to construct an additional dock, railway, and other works to extend the city and county of Bristol, and for other purposes. The works in question are shown on plan No. 5, and they include the following details:—

1. A diversion of the Avonmouth and Severn Tunnel Railway, commencing on the north-west side of Gloucester-road, and continuing for a distance of about 2,000 yards to the existing railway.

2. A diversion of the Bristol Port and Pier Railway, commencing at a point north-west of Richmond-terrace, and continuing for a distance of about 800 yards to the Avonmouth and Severn Tunnel Railway as diverted, including the provision of a new passenger station and a new road in substitution for those to be closed by the new works.

3. A reclamation wall, commencing by a junction with the northern approach pier to the lock, and continuing in a northerly direction, slightly on the seaward side of Dumball Island, and at its termination joining the existing sea embankment as indicated.

4. A reclamation embankment commencing by a junction with the southern approach pier to the lock, and continuing along the northern side of the outfall of the river Avon, and at its termination joining the approach works of the lock of the existing Avonmouth Dock.

These railway diversions and reclamation walls will provide an area of about 250 acres in extent, suitable for the construction of the new dock, lock, graving dock, sheds, railway sidings, and other requisite accommodation.

5. A dock to be at first constructed having 25½ acres of deep water space and a total available quay length of 3,200 lineal feet. The dock area will be surrounded by about 221 acres of land in the first instance; but the dock is so situated that the water space may be hereafter readily extended if required.

An extension, as indicated by dotted lines on the plan, would provide four additional berths for steamers of the largest class. This extension, consisting of two branch locks, would increase the total deep water area to 40 acres, and the surrounding land would be reduced to about 207 acres. It may be seen by the plan that still further extensions may be made should they become necessary. The quays bordering the dock will be wide and commodious, and readily adaptable to the timber, coal, or general trades, as may be most suitable. The walls will be founded upon hard marl, and there is ample room for the provision of sidings and railway connexions. The graving dock is to be situated as shown on the plan, and it will be 850 ft. in length by 90 ft. in width, thus affording accommodation for steamers of the largest class. The estimates provide for 3,200 lineal feet of deep water quays, sidings to the extent of 20,000 lineal feet, and 525,000 square feet of shed area.

6. A junction cut between the existing Avonmouth Dock and the proposed new dock to afford communication and provide a second entrance in case of need. It will be observed, however, that the value of this second entrance is qualified by the length of the lock of the existing Avonmouth Dock, which will not admit vessels longer than 480 ft. In this respect, therefore, the arrangement is less desirable than that included in the scheme of 1900, where the graving dock was available as an emergency entrance for vessels of the largest class.

7. An entrance channel from King-road, together with an entrance lock, 850 ft. long between the extreme gates and 85 ft. wide, with sills 8 ft. below the outer sills of the existing Avonmouth Lock.

This new lock will be practically on the

site proposed by Mr. McKurrich in connexion with his scheme for a new dock at Avonmouth. The present engineers consider that there is no difficulty in this site that cannot be overcome by modern methods of construction, and, bearing in mind all the circumstances of the case, they believe the lock to be in the best position that can be selected for the entrance to a dock on the Dumball Island site. The approach piers are designed so that passenger steamers can lie alongside and discharge passengers in close proximity to trains standing upon the piers. In the case of a steamer drawing 30 ft. of water this convenient system will be practicable for two hours before and after high water of ordinary neap tides. If facilities should be thought necessary for landing passengers at low water of spring or neap tides, the low-water pier proposed by Mr. McKurrich might be adopted, but its construction is not included in the present programme.

In addition to the works mentioned above, the Corporation propose certain road and street improvements, a deep-water wharf alongside the floating harbour, and other improvements in the city docks.

According to estimates prepared at the instance of the Corporation, the purchase of land and the execution of the works specified in the Act will be as follows:—

Avonmouth works.....	£1,428,885
Graving docks	250,000
Equipment and engineering ...	271,000
Road and street works	13,000
Works authorised by Dock Act,	
1897	114,600
Deep water wharf (city docks)	190,000
General purposes	182,722
Total.....	£2,450,207

The estimate for that portion of these works dealt with by Sir J. Wolfe Barry, Sir Benjamin Baker, and Mr. Hurtzig amounts to 1,804,700l. Thus it will be seen that the cost will be 970,300l. less than that of the Dockisation scheme, and another important saving is represented by the difference in the cost of dredging. The heavy annual outlay in respect of this item inseparable from dockisation will be avoided, as the only additional expenditure in connexion with the new dock will be the maintenance of the approach from King-road, the annual cost of which is estimated at between 4,000l. and 5,000l.

Regarded as a whole, the latest proposals appear to provide all the accommodation required at the present time, and to lend themselves to the execution of all such extensions as may be expected to be demanded for many years to come. Until quite lately the Local Authorities have clung very tenaciously to the idea that the city itself is the proper centre of the port. As the seat of various manufactures, Bristol is no doubt an important place; but it is still more important as a collecting depot for other and more populous districts. The old order of things, which made the city suitable as the site for a harbour, has long since passed away. The mouth of the Avon is now the true centre of future expansion, and is the place where Bristol may hope to lay the foundations upon which her prosperity and greatness may once more be built.

NEW SCHOOLS AT HARTLEPOOL.—The School Board of Hartlepool have instructed Mr. J. Mitchell Bottomley, of Middlesbrough and Leeds, to prepare a scheme for the proposed new Board school in Baltic-street, Hartlepool.

NOTES.

The Monument to Queen Victoria. IN the course of his speech at the Mansion House on Tuesday, Mr. Balfour, in referring to the proposed site near Buckingham Palace for a monument to Queen Victoria, observed that he hoped the memorial would involve something more than a mere monument—"some great architectural and scenic change in that part of London." This remark points in the direction of what we have already suggested—that in order to place any monument effectively in connexion with Buckingham Palace and the Mall, some rearrangement of the site would be necessary, so as to centralise the monument. Something very fine might be done if alterations are carried out on a large scale and in a right artistic spirit, and it is satisfactory to observe that Mr. Balfour at all events seems to have large and liberal ideas on the subject.

Bronze Statue at Naples. THE beautiful bronze statue recently discovered by Professor Orsi on the Barbatelli Estate, near Pompei, is not as yet exhibited to the public, but by the kindness of the Director of the Naples Museum, we were able to make a personal inspection. The statue is not, as has been erroneously reported in some accounts, "life size." It is about 4 ft. in length, and represents a nude ephebos in an extraordinarily perfect state of preservation. The paste eyes had fallen back into the head, but have been restored to their place, and give the statue, as in the case of the "charioteer" of Delphi, a wonderfully life-like air. Together with the statue were found two bronze scrolls, similar in character to those often held in the hands of figures in vase painting. It is conjectured that the youth held these scrolls in either hand, and that they may have served as supports for pendant lamps. One of the scrolls is large and heavy in proportion to the delicate hand that it is supposed supported it, but in any case they are not flowers or tree branches as has been stated. The statue shows clear signs that it has been coated with silver, as patina has only formed in places where the silver coat is worn away. In style, this exquisite figure recalls the manner of Polycleitos. It is ultimately to be placed in the Sala dei Bronzi in the Naples Museum.

The Government and London Water. THE rejection of the Bill of the London County Council for the purchase of the water companies again leaves the ratepayer at the mercy of these companies. In asking Parliament to reject this Bill the Government have acted contrary to the wishes of London, which desires to see some active step taken towards the municipalisation of the water supply. In place of the Bill of the County Council the Government can only give a hope of a Bill next Session. But why in a purely local matter should not London be allowed to carry out its own scheme? This is not a so-called Imperial matter, and yet the Government treat it as if it were one which concerned the whole of England. Representatives of the provincial towns vote against the Bill of the governing body of London, though they have no concern with the question at all. The proper course would have been to have allowed this Bill

to go before a Select Committee, and be discussed in its details before that tribunal. And we ask again, what is the use of lecturing the people of London on their want of public spirit when they are not allowed to manage their own affairs?

In the City of London Court last week the war—which has been blamed for many things—was held accountable for delay in the delivery of two trucks of bricks. They were consigned from Southborough to Messrs. Mills, of Westcombe Park, and the railway company took fourteen days to deliver one truck, and seventeen days the other. The length of the journey being only thirty miles, the bricks jogged along at the rate of something less than two miles a day, which, as the plaintiffs' counsel remarked, was slow, even for the Chatham Company. The latter were sued for 50*l.* damages, as the brick merchants were liable to penalties under a contract. In deciding the terms of a contract it is customary to provide for such eventualities as strikes and lock-outs; but when your material is once on rails you rely on it reaching its destination within a day or so. In this case, however, the company successfully pleaded non-liability on the ground that the line was at that time practically taken over by the War Office for the conveyance of munitions of war, and they were compelled to put all other traffic on one side. This is hard on the contractor, and we feel, with Mr. Commissioner Kerr, that as the Government had caused the delay, they ought to pay. But the Government will be called upon to pay for a vast amount of direct and consequential damage in connexion with the war, and would probably contest a claim of this nature. Messrs. Mills were given the option of having a special case stated, and more may therefore be heard of the matter, especially as it is by no means a solitary case.

The inquiry by the Board of Trade into the regulations proposed by the electric lighting companies was concluded last week. The companies, represented by their counsel, posed as aggrieved parties, because a few consumers, whom they supplied with current at 100 volts, refused to accept service at 200 volts. The reasons advanced by those objecting to the change were either that they were afraid of getting shocks from the increased pressure or that they were entitled to a substantial indemnity. The danger from shock was hardly touched upon at the inquiry, although from the facts stated in the next note it will be seen that it is no imaginary danger. The County Council based its arguments for indemnity on two grounds—namely, on the right of the consumers to veto the change, and on the fact that the 200-volt lamp is not as efficient as those made for lower pressures. We were astonished that electricians could be found who would not admit the inferiority of the 200-volt lamp as at present constructed. Many consumers who have had experience of both have very strong opinions as to the shortness of the life of the high-voltage lamps. The tests quoted by Professor Ayrton were conclusive as to the low efficiency of these lamps, and they agree with the results of experiments that we have made ourselves. It will be seen that

the companies have not made out that their increased pressure is an undoubted benefit to the public, and hence they have no claim to propose that certain persons should be deprived of their vested rights. The attitude that the London County Council has adopted towards this increased pressure is the right one, namely, that the only reasonable way of giving a solatium for the loss of a consumer's rights is that he should have a substantial reduction in the price in the shape of a discount. As Mr. Danckwerts, K.C., on behalf of the City Corporation, suggested, the analogy of compensation cases should be taken and those persons should be charged 10 per cent. less than anybody else.

The paper recently read by Mr. Connett on "Combined Trolley and Conduit Tramway Systems" to the Institution of Mechanical Engineers is of special interest, both to engineers and town councillors. Many towns at the present time are considering the question of electric traction, but are in doubt whether to adopt overhead traction, with all its known drawbacks, in crowded thoroughfares or to adopt an expensive scheme of conduit tramways. In this paper Mr. Connett describes several ways of combining an overhead trolley system in the suburbs with a conduit tramway for the central streets. These methods are not experimental, as Mr. Connett has already constructed some fifty miles of electric conduit tramways in Europe and America. In regard to the vexed question of whether the centre-slot or side-slot system should be adopted, it was interesting to hear that the municipal authorities in Buda-Pesth, Berlin, and Brussels, absolutely prohibit the centre-slot, whilst in Paris only about five per cent. of the conduit mileage is centre-slot. This objection is probably due to the additional rail in the centre of the streets required by the centre-slot, as every joint of a rail with the paving shortens the life of the latter. A valuable description is given of the shallow conduit designed for use on the Pont de l'Alma in Paris. It is important to know that it is quite possible to make the conduit shallow in places, as this will lead to many economies by avoiding the necessity of removing and lowering sub-surface obstructions. In Berlin the change from conduit to trolley is done without stopping the car. A wheel on the lower part of the plough runs up an inclined plane and so raises it through the slot to the groove of the wheel rail and then a turn of the crank by the motor man raises it clear of the track. Mr. Connett estimates the cost of the conduit to be 6,000*l.* more per mile than the cost of the overhead trolley and there has to be added to this the cost of removing sub-surface obstructions, which will vary greatly with the locality. He has certainly made out a very good case in favour of a combined trolley and open-slot system, and the conclusions to be deduced from his paper agree with the results arrived at by the Highways Committee of the London County Council.

Some extensive structural alterations are being made by Messrs. Patman & Fotheringham, contractors, for the proprietors of a serial publication at No. 142, Strand, which stands opposite the end of Catherine-street. The house, distinguished until lately by its sign of a half globe, is noteworthy as having

been occupied by the Chapmans when, in 1851, George Eliot first came to London. That house was her home during the two following years; whilst living there she wrote many essays for the *Westminster Review*, and did some editorial work that the Chapmans placed in her way. The premises were rebuilt some sixty-five years ago as "Wright's" Hotel. In more recent times they formed the offices of the International Life Assurance Company, and then of a well-known tourist-ticket agency. They stand on the site of the "Turk's Head" coffee-house, a favourite resort of Dr. Johnson, Boswell, Alexander Chalmers, Hewerdine, and many other literary celebrities. In his "Records of My Life" (vol. i.) John Taylor mentions that he often met Richard Parson at the "Turk's Head" in the Strand.

At the Fine Art Society's Gallery are two new exhibitions. Mr. S. J. Hodson's water-colour drawings of "Picturesque Towns on the Loire" and elsewhere, and a collection of water-colours by Mr. Eyre Walker, under the general title "By Woodland and Stream." Mr. Hodson's subjects are mostly architectural, and illustrate many picturesque buildings or collections of buildings; but they are rather formal in style and there is a want of clear and definite colour in them. Some of the views of towns comprehensively treated are among the best; for example, "Saumur from across the River" (8) and "General View of Angers" (9), a pile of houses climbing up the hill and topped by two thin spires. "The Castle, Vitre, Early Morning" (51), is a fine drawing with more effect in it than most of them. Among the street scenes "A Street in Vannes" (17) shows a curious old house built out of heavy and massive timbers; "The Hotel de Ville, Orleans" is a good example; the "Cheapside" is rather spoiled by the bad drawing of the Bow cupola. The collection of works by Mr. Eyre Walker is a beautiful one; every drawing is worth looking at, and some of them represent the highest quality of landscape-painting in water-colour. Among these specially attractive examples may be named "Semmerwater, Evening" (13) with the warm light on the hills and the rich bit of colour in the small lake reflections in the middle distance; "On the hills above Brendon" (19); a "Hillside, Llanbedr Woods" (27); "In Ashdown Forest" (30), a small landscape differing in tone and manner a little from the majority—it must be admitted that Mr. Walker rather runs to one tone in his landscape, which mostly have a kind of rich mellow autumnal tint pervading them; "On the Watershed of England" (47), a wide-sketching scene of undulating Yorkshire moor; and "Brambles and Ragwort" (56), a perfect little picture composed of a bit of foreground vegetation over which some distant white cliffs are seen faintly reflected in the sea. This is not one of the more important works in regard to scale and subject, but as a work of art it is perhaps the most complete and satisfying picture in the room, in the sense of making the most of the materials and keeping the balance of the whole.

The two well-known galleries next door to each other in the Haymarket, Mr. Maclean's and Messrs. Tooth & Sons, both have new

collections of pictures on view. At Mr. Maclean's the centrepiece is M. Lhermitte's large picture "The Reapers," which we have seen more than once before; a work rather inspired by recollections of Bastien-Lepage. A very fine view of "Whitby," by Mr. Albert Goodwin, is also among the collection in the principal room, and a powerful Highland scene by Mr. Hurt, who in this class of subject is, indeed, a kind of double of Mr. Peter Graham, but runs his original very close. Then there is Mr. Leader's "Old English Village Church," which we remember at the Academy some years ago, and Mr. Shaw's "Stormy Day in the Channel," which also we seem to know, or else a predecessor very like it. There is an example of Meissonnier, not quite at his best, but superior to the best of most other painters as far as execution goes, at any rate. Among the works in the outer room is a large specimen of James Maris, "Katwyk, Holland," with a grand sky but his usual depressing effect of dingy colour, and a calm sea picture by Mr. Fritz Thaulow, "Fishing Boats off Dieppe, Moonlight," in which at all events there is no lack of fine colour.

MESSRS. ARTHUR TOOTH & SONS have the good fortune to include in their present exhibition one of the best pictures that Eugène Delacroix ever painted, "L'Amour qui vole," a cupid flying off with some property of a seated nude female figure who may represent Venus, though she is not very goddess-like: but the drawing and painting of this figure are so perfect that for the moment one is tempted to forget the essentially cold and academic character of Eugène Delacroix's art in admiration for the perfection with which, in this case at least, he has worked out his own ideal. Next to it hangs an exceedingly clever picture by M. Théodore Hermann, a name we do not recall—three ecclesiastics with countenances delightfully expressive of their enjoyment of a particularly good bottle of wine; the costumes and accessories are painted with the most brilliant though not obtrusive naturalism. It is a kind of subject that is not worth the talent displayed over it, but the talent is indisputable. Among other works are Sir L. Alma-Tadema's charming little picture "The Flag of Truce"; "On the Alert," by Rosa Bonheur, a small painting of two stags which at once shows a master hand; a good specimen of Van Dyck's always excellent but constantly repeated dish of cows and landscape; and a powerful though rather loaded woodland scene, "Forest Pastures" by Mr. Ch. Courbet. The small room contains some interesting water-colours; two beautiful little works by Mrs. Allingham, others by Varley, David Cox, and Sutton Palmer, whose "Birches and Boulders" shows a quite exceptionally good study of foreground detail; and a figure by W. Hunt, "A Beggar Boy," which shows Hunt at his best in regard to qualities of pathos and expression as well as execution.

A COLLECTION of oil-paintings by Mr. Rex Vicat Cole forms the latest addition at Messrs. Dowdeswell's galleries. These are exhibited under the title "A Year in Wharfedale;" the central and largest painting, "Spring Delights," is the one which was exhibited at

the last Royal Academy and which we noticed in our article on the pictures of last year. The rest of the collection—forty-eight pictures in all—is of rather unequal value; the greens are rather crude in some of them, and some of the effects of colour and sunlight seem a little theatrical. Those we admire most are among the August pictures—"Ower Fell," "Bolton Abbey from the Woods," with the river making a silver ribbon at the bottom of the vale; "Barden Moor," and also the September picture "On Barden Fell." A frame of beautiful drawings of details of leaves and sprays is exhibited, which are to form part of the illustrations of the forms and growth of trees for a book on "British Trees" which the artist has in preparation. The present set of sketches form complete illustrations of the Guelder Rose.

The Institute of Architects has issued its next year's prizes, issued by the Institute of Architects, is of more than usual interest. The subject for the Soane Medallion is a swimming-bath, the interior of which is to be treated in an architectural and monumental manner. A swimming-bath interior, with its water surface and consequent reflections, is really an exceptional chance for a fine architectural effect, as the Romans knew so well, though we never get an opportunity for such a treatment now; it ought to be a pleasure, at least, to do it on paper. For the Tite Prize the subject is a memorial chapel in the Italian style, for which the main lines of the plan are given, leaving the details to be worked out at the pleasure of the competitors. The subject for the Essay Prize is "The Employment of the Order in Renaissance and Modern Architecture"; a subject which gives a chance for some able and thoughtful student of architecture to produce an essay which may be of permanent value as a contribution to the higher architectural criticism.

THE SURVEYORS' INSTITUTION: THE PRESENT CONDITION OF THE BUILDING INDUSTRY.

An ordinary fortnightly meeting of this Institution was held on Monday evening, at No. 12, Great George-street, Westminster, the President, Mr. John Shaw, occupying the chair. Some donations to the library having been announced, and a vote of thanks to the donors having, on the motion of the chairman, been agreed to, the discussion on Mr. Thomas Blashill's paper, on the "Present Condition of the Building Industry," was resumed. Mr. P. E. Pilditch said that he was surprised that Mr. Blashill had been able to invest the subject, which to many would be regarded as dry, with so many of the attributes of poetry. The paper consisted of two parts, the first of which dealt with the relations of the architect and the surveyor with the client and with the builder, and the latter part dealt with a subject of even greater importance, not only to the profession, but to the nation—viz, the question of labour and its present effectiveness, and its effect upon the building industry. As to the suggestion made by Mr. Blashill as to having all details ready before starting a building, that would be a beneficial thing if it could be done, because it would give the builder a greater opportunity to give closer estimates, but he could not help thinking that it was a counsel of perfection, and one that those in practice would find it difficult to give effect to. In most jobs the employer rarely made up his mind to start building until the last moment; moreover, clients themselves always liked to exercise their own individuality upon the details of the work to be carried out. If all

the details were prepared beforehand, it frequently happened that if, when the client saw those details in the course of being carried out, they were not exactly as he would like them to be, he had the work delayed. Moreover, there was always a very useful margin of time during the first weeks or months, during which the foundations were being prepared, which gave an opportunity for the details to be worked out quietly by the architect. Therefore he did not think Mr. Blashill's idea was practical in most cases, though he quite agreed that double the time given to the drawings at the beginning would save much time in the execution of the work. He did not quite agree with Mr. Blashill when that gentleman said that the quantities, if properly priced, should form the basis of a settlement. He did not quite understand that, because the quantities were priced by the builder, and if accepted as part of the contract, must be the basis of the settlement of account at the end. Who was to say if they were properly priced? It frequently happened that a builder had special reasons for pricing some things high and some low, and it would be impossible to depart from the basis of the contract accepted by the builder himself in settling the account. Another exceedingly interesting point raised by Mr. Blashill was as to sub-contractors being under the direct orders of the architect, and provision being put in contracts for that purpose. He had tried that system and its antithesis and there was something to be said for each. He thought the most important matters, such as the iron work, the large fittings (such as lifts) should be under the direct control of the architect; and as to the point made by Mr. Blashill, of the builder not getting his proper profits, he did not see how that could be. When the builder was pricing his quantities and had the amount of the provision before him, it was always open to him to add to the provision, and if he cut out his profits, surely he did so at his own risks, and must take the consequences. With regard to the suggestion as to the direct employment of workmen and the carrying out of work by an employer without the intervention of a contractor, he had a case some time ago in which a client determined to adopt that course under specially advantageous circumstances. The result was entirely unsatisfactory, and although the employer gained something in the way of his relation to the workman, and was able to give the workmen a farthing or a halfpenny an hour more than the trades-unions rate of the time, in order to get the work done quickly, he was not able to make up for the delay in other ways. As there was no contract, there was no builder to keep a check on the alterations made from time to time to suit the whim of the employer, and in the end the work took nine months longer than a contractor would have taken, and cost from 25 to 30 per cent. more than a contractor would have done it for, that result being partly because the employer had none of the large plant and facilities which the contractor had. The long experience that the large contractors had had was of great use to architects and surveyors, and employers who engaged them. In regard to that all-important subject of labour, public as well as professional attention had been directed for some time to the question of the effectiveness of present day labour, and its influence not only upon individuals and trades, but also upon the national interests. Every speaker in the discussion so far had, with one exception, had to find some fault with the British workman in the building trades, against whom there seemed to be two serious complaints. The first was the indifference, loss of value, and lack of keenness of the present worker, and a good deal had been said as to that. Mr. Taylor, who spoke at the last meeting as the representative of the workmen, said that the practice of "St. Monday" was dying out. That did not coincide with his (the speaker's) experience. He had made some calculations, and in his experience (and taking the most favourable kind of jobs from the point of view of the workman, viz, large jobs, in the heart of London, where the best class of workmen could be got) quite 10 per cent of the men did not go to work on Monday. Last Christmas-day fell on Tuesday, and on two jobs that he had in hand at that time the contractor decided that in order to get over the difficulty of the Christmas holiday (for it was not only a difficulty of Saturday and Sunday, but of all holidays) it was

decided to close the works for the whole week, so that there should be no excuse for the men not coming to work at the proper time on the following Monday. Unfortunately, the result was the same as on the previous Christmas, where the works were not closed in the same way, and rather over 10 per cent. of the men failed to turn up. This seemed to be an ineradicable tendency on the part of the British workmen of to-day. The second point he had to refer to, which was even more serious, was the tendency of the men and the unions to act in the belief that to benefit themselves by raising wages the workmen should reduce the output. Now, unquestionably this tendency did exist, notwithstanding what had been said to the contrary, and it was shown in many ways, and very clearly in regard to the extra price charged for overtime. In all the trades, with two exceptions, in the building trade, if the builder wanted a man to work a quarter or half an hour after five o'clock, whatever pressure there might be that man had to be paid rate-and-a-quarter, and that, of course, made overtime prohibitive, unless the employer was prepared to pay more for the work. The two exceptions were the plumbers and labourers, who worked up to seven o'clock in case of necessity without the extra 25 per cent. overtime. He did not understand why the unions did not permit the men (the individual man was perfectly ready to do so) to stay on a job a longer time when necessary (up to, say, one hour per day), without extra pay. If that were done, it would be a benefit to the men as well as the employer. The extra charge for overtime might very well mean a large extra cost to the work, especially as the men did not give anything in the way of greater efficiency in labour for the extra money received. This conviction on the part of the men and the unions that in reducing output they were keeping up wages was a most serious matter, and deserved the serious attention of the unions, whom he did not altogether blame in the steps they had taken to safeguard the interests of the men, and their influence had undoubtedly benefited the men and the employers and general public; but so far as that influence abetted the tendency to limit output so as to increase wages, it was bad. The unions were responsible for another fact, and that was admitting into their ranks incapable men who, when admitted, had to be paid the union rate. It might be said that that was more a matter for the unions, but that was not so, because it very much concerned the employer, and it really affected the general public, if an indifferent bricklayer had to be paid 10s. an hour, or the same as the best and most capable man. During the last carpenters' strike many inferior men were let into the trade-union, and for the rest of their lives they would be entitled to receive the highest rate of wages, though they might not be worth more than three-quarters of that rate. Wages had risen during the last thirty years from 8d. to 10s. per hour, but there was a good deal to be said for that increase. The increase of rents for workmen's cottages had been from about 6s. to 10s. per week; the emoluments of other classes and the general standard of wealth had also risen; and the workman was entitled to his increase for those reasons; but the question was whether the work had risen in effectiveness. From what he could learn, the average workman of the present-day (and by that he did not mean the old worker of twenty-five years ago, living and working now) did not do such good work, and his effectiveness had gone down 30 per cent.; and in so far as that was a fact, the case for the increase of wages was not made out. He did not mean to say that that was so with all workmen in the building trades, and he knew of an instance of an ironworker, a fitter, an excellent workman, who was only receiving 8d. an hour, which was a case, on the other side, of a man getting less than he was entitled to. But he feared that workmen were not the only class who had shown a desire for greater comfort in return for less exertion. We were suffering from the results of the unexampled prosperity of the past few decades, and other classes had shown indications of the same tendency as the workmen. Perhaps the period of sharp competition now to be expected would wake up the workman, traveller, and manufacturer alike.

Mr. T. M. Rickman, Past President, said that one of the most important matters Mr. Blashill had touched upon was that of labour. All of them who were engaged in building work

must have spent time in watching workmen at their work, and with a little experience one could tell the kind of stone, for instance, a man was working on by the character of the blow he inflicted upon it, and the workman's character by the effect of that blow. Within the last fifty years machinery had been brought to bear on the trades of joiners, carpenters, plumbers, and masons, and much that used to be done by muscular exertion was done by machinery, and the workman was now expected to work more with his head. Most people would have supposed that with such a great diminution of physical exertion there would have been a much larger amount of work done per man per day, but they had heard that hours of labour had been reduced, the amount of work eminently reduced, and the wages largely increased. Forty years ago an intelligent joiner he knew was hoping soon to get 1*l.* a week on which he would marry. There were few joiners now who got much less than 2*l.* per week, and for much shorter hours. What he thought all must have hoped would have followed the reduction of hard physical exertion was that workmen would have exercised their wit and endeavoured to do good and full work and make a position in the world for themselves. He was afraid the men had not progressed in that way. The position of the architect as arbitrator had been referred to; he thought that no man could become an efficient judge unless he had been in the habit of taking a side, and that on both sides. Now a building surveyor was in that position; he was sometimes engaged by the builder and sometimes by the architect and which ever side he worked for he endeavoured to do his best for it. An architect had seldom that opportunity; he was called upon to act as arbitrator between the builder and the client and seldom acted for the builder exclusively. For that reason he thought that as a rule the building surveyor was a more proper person to act as arbitrator than one engaged exclusively in architecture. He had been much struck in studying buildings, ancient or modern, by the fact that whatever the material used it dated itself. One could tell in any modern building when cast-iron fell out of use and wrought-iron came in; and by looking at the saw marks one could tell whether timber had been worked by a circular or straight saw. In that way one could tell within a few years the date when a building was erected. The mark of present-day buildings was that of machinery. The question between employers and architects was largely one of time, and the use of machinery was a question of time—the time of the workmen as well as the time taken to build—and many questions between architects and surveyors were questions of time. If an architect was allowed more time, he would prepare his drawings in detail, and as he (the speaker) used to prepare drawings when he was in his articles; every detail was made and no questions were asked as to any detail in the course of the work. Such details were very important, and if they were supplied to the builder at the beginning he would be able to make his arrangements accordingly; if they were not, there was no time to do what was really necessary if the work was not to be delayed. It was very much the same in regard to divisions of trade; if the client could make up his mind, and give the architect reasonable time to prepare his design, many troubles as to sub-contractors would be avoided.

Mr. E. Dru Drury said that, as to the want of time—the little time which the employer gave them to carry out work—he might mention two experiences he had had, one of preparing designs, specifications, and quantities, and putting up new factory buildings in three months (which showed the difficulty one had to contend with on the ground of time); and the other where the ample time of six months was given to rebuild certain premises. As to the British workman, he was thoroughly in favour of the workman combining for his own protection. That was what every one did, even architects and surveyors. But the objection to trades-unions was as to unwritten laws, and any one who knew anything of the unions knew that there was a great deal of that. It had been said that a bricklayer now would lay 470 bricks per day, which was a very liberal estimate. He had been assured that by a building surveyor and foreman that it was a good result for a bricklayer to lay 400 bricks, but that he could easily

lay 800. Of course, the bricklayer would tell them that in laying 400 bricks he had lifted so many tons, and that he ought not to lay more; but was that to be the standard for all? What appeared to him to be the evil was the levelling-down principle of trade unionism. As mentioned by Mr. Blashill, the average workman had no incentive to do his best and there was no doubt that that was perfectly true. Architects, surveyors, and others, when they were article'd, looked forward to the time when they would become principals, but the British workman was condemned by the unwritten law of trades-union to keep down to the level of his less capable fellow workmen, notwithstanding what Mr. Taylor might say. There had been a great falling off in apprenticeship, but there appeared to be a desire for a reintroduction of the system. In the *Times* some time ago eleven secretaries of trade societies wrote advocating apprenticeship in order that craftsmen might properly learn their trades and remarking that technical schools, though very well in the way, did not supply the want; they were not within reach of the great majority of young men serving their time, but they were very good adjuncts to apprenticeship. A gentleman of his acquaintance was asked recently to talk the surveying class at a technical school, but he refused when he heard that the object was to turn out young men so that when they had gone through their course they would be able to take surveyors' places. That gentleman had served three years as an article'd pupil, without pay, in an architect's office, and he did not think it desirable or possible to turn out young men in three months to compete with full qualified gentlemen.

Mr. W. Shepherd said that, from a contractor's point of view, he could hardly appreciate Mr. Blashill's desire for more consideration to be shown to the client or employer. In his experience, and it was not slight, the employer was the source of much trouble in regard to building contracts. As a rule, the client knew pretty well what he wanted and how much he was prepared to spend, but in nine cases out of ten the client's ideas of cost were altogether inadequate, and the architect was in an impossible position when asked by the client to give an estimate as to cost. It was a very difficult thing for an architect to estimate the cost of buildings, however great his experience might be, and in his opinion every job had its own price, and it was not possible to adopt any rule of thumb for arriving at the value of a particular building. In many cases the amount of the tender was in excess of the amount the client was prepared to spend, and the architect had to modify his design in order to come within the limit of cost imposed by the client, and very often things were taken out from the design which had subsequently to be re-introduced. All this indicated the difficulties which arose in consequence of the action of the client. He did not think that Mr. Blashill recognised to the full extent the importance of the quantity surveyor, and he thought that with our modern methods, the quantity surveyor was a necessity, and endeavoured to do what was just to all parties. He agreed with every word that Mr. Rickman had said as to the building surveyor being more fitted to act as arbitrator in building disputes than any other professional man who had to do with building. As to the possibility of doing away with sub-contractors, or to the inconvenience of them, he thought the word "sub-contractor" was a misnomer: what was meant was the specialist. As had been said, the question of time had much to do with this, and if the client gave the architect sufficient time to show clearly everything that was required for the completion of the building, it would be to the client's interest to let the general contractor deal with these specialists. He was positive that the specialist got an enhanced price when the architect went direct to him, and he knew practically there was to be no competition. In regard to the labour question, he was very much interested in Mr. Taylor's speech on the last occasion. He thought Mr. Taylor was to be complimented on his candour, and from the labour point of view there was not much to be found fault with in Mr. Taylor's remarks. It was within his, the speaker's, knowledge that Mr. Taylor was appointed to settle a dispute between two trades as to who should do certain work, and Mr. Taylor, a bricklayer by trade, decided the case against the bricklayers, and brought a good deal of trouble

upon himself in consequence. To a certain extent Mr. Taylor dissociated himself from the collective opinion of his class, and altogether of much exception could be taken to what he said, although he seemed to rely upon his imagination in one or two cases. In fact, the speaker, did not think there was any deep-laid conspiracy on the part of the men to diminish the output or to do the minimum of work. The trouble was not due to that at all, and if the matter were looked at carefully the trouble would be found to be due to collectivism. As to what Mr. Taylor said about it being customary, on works where he had been, for the younger men to take a longer stretch so as to help the older men, if Mr. Taylor meant that that was at all general he felt that that was not according to fact. He remembered when there was practically but one trade-union, and that was the Operative Stone-masons, which was not instituted for the purpose to which modern unions applied themselves. In its early stages it was simply a benefit society, and so far it was a useful institution. It was, he believed, in 1858 or 1859 that the funds of this society were applied, on the occasion of the great lock-out, and a few years before, at the building of the Houses of Parliament, in an endeavour to get a rise of wages. If a member of the Masons' Union had been promoted from banker to fore-man, he received a notice in those days from the society that he was not to attend any of the lodge meetings; but it was otherwise now, for societies such as the Bricklayers', Plasterers' and Joiners' endeavoured to force foremen into their ranks, so as to have them under their control; and if a foreman exercised any preference in giving employment to competent workmen he was a marked man in his society. He (the speaker) had known many instances of a foreman being summoned to his lodge and fined because he was exacting more work than what was considered to be right. How all this was to be altered he did not know, especially as now, in the case of building contracts for Public Authorities, it was a condition that the workmen were to be paid trades-union rates, and the employers were to be those recognised by the unions. That meant that every incompetent man employed on a work got the full rate, and while that was so, what incentive was there to man to excel either in the quality of workmanship or the amount he did?

Mr. Arthur Vernon said there were three important points which he would like to refer to, and which he would put in the order of their importance, the first of which was the relation of capital to labour. Most of them had had painful experience of labour troubles, and they could not feel that some of Mr. Taylor's views were consistent with the facts. There was something entirely wrong with the present state of labour. John Stuart Mill said that he did not believe that the labouring masses would ever be content to work for wages, and he remarked that the great drawback was that the workman tried to get all he could for as little labour as possible. The remedy, Mill thought, was some form of partnership, either with capitalists or among themselves. That was the great problem that had to be worked out by public opinion and necessity. What we had to do was to see that men were not limited in their output, and were not dragged down to the common level, but each left free to earn what he could. That seemed to be the only solution in our country, of the problem of the condition of the labour market. Trades-unions, such, could not be objected to, and he saw no harm in them, for he sympathised with any arrangement that made for the well-being of the labourer. With regard to the rapid increase of cost in buildings in the country as well as in London, that was a national calamity, for it obstructed general progress. Some cottages for labourers he had built in the country a good many years ago cost from 6d. to 6½d. per cubic foot. Exactly the same buildings erected to fit the modern by-laws cost from 6d. to 8d. per cubic foot. That increased cost was due to a rise of about 20 per cent. which could be equally divided between capital and labour, and so to the local by-laws, which were absolutely unnecessary in country districts in many cases. As to the relations between architect and employer, he would like to remind them that nine out of every ten buildings erected gave rise to trouble, and it was only the difficult cases he heard of. In the great majority of cases employers, architects, and builders got on very well indeed, and with very little friction. In

forty years' practice he had never had a suit at law with either builder or employer, though he had been very near it once or twice.

The Chairman, in closing the discussion, said they were greatly indebted to Mr. Blashill for his admirable paper and to those gentlemen who had taken part in the discussion. He believed that the paper and the discussion would be of value to the building trade and the Institution.

Mr. Blashill, in reply, said he would have been glad to have had more discussion from the workman's point of view and from workmen. He had tried to treat the whole question as a question among colleagues, because not one of them connected with the industry could easily be dispensed with, and all should work together with as little friction as possible. He had been misunderstood to say that he thought the quantity surveyor should write the specification. He thought the quantity surveyor would write a more logical document, but that the architect would know best what ought to be put into it. As a matter of fact, the architect ought to write the specification, and not trust to the quantity surveyor for it. He still thought that builders ought to be encouraged to do the ironwork in a building, because architects could get it tested just as well as they could test timber. Mr. Mann had asked how he (the speaker) would ascertain the proper prices to settle up the account. That was a difficult matter, because the builder did not like the prices in the tender to be seen by the architect. It had been his practice to have left to his judgment the settlement at the end of the prices, in contracts, for extras and additions; but every builder would not be satisfied with that arrangement. On the other hand he thought it was quite inadmissible, as a matter of business, to leave it entirely to the builder, because even if the builder did not intentionally go wrong in the prices, there was the liability of mistakes. Why should not the quantity surveyor be allowed to look through the prices? As to labour, he did not see how Mr. Taylor made it out that there was any relation between the increase of wealth of a country and the labour of individuals; but it was a very difficult question to deal with. We should get into a fog if we made any comparison between the two things. Mr. Taylor's account of the conduct of the workmen was fair on the whole, although it reminded him of the historic complaint of a man who was convicted of some crime by two men who had seen him do it, although he could have brought forward in his defence twenty men who had not seen him do it! The fair workman may not always see the things done that were complained of, but he was afraid many of those things were done. Mr. Taylor threw some doubt on the statement which had been quoted from Lord Brassey's paper, as to some work which should have cost 2½s., but which actually cost 5s. He (the speaker) ought to have mentioned that Messrs. Lucas, for whom the work was done, gave full particulars at the time that they gave their statement. The work was for the railway station, with hotel buildings, at York, and there was no doubt that what the firm said was perfectly fair. As to the diminution of the work, no one suggested—certainly no one could prove—that the trades-unions did directly, by written law, advocate the diminution of work. But that was not all. A builder had written to him saying that during the last ten years the increased cost of labour had been from 75 to 100 per cent., and that accorded with information from various sources. If the increased cost of labour had been so much, and the increased cost of wages only 10 per cent., where had the remainder gone? No one seriously denied that there was loitering of some kind, and if there had been any one ready to deny that, he should have been prepared with a good deal of evidence. Any one interested in the subject he would recommend to read the works on Trades-Unions and on the Social Democracy by Mr. and Mrs. Sidney Webb, which dealt very fairly with the subject. They mentioned the system of working slowly, and they mentioned it to blame it—it was called in the north "going canny," i.e., going cunning, or shifty; and the existence of a thing that had a name could not very well be denied; and it was thoroughly well known to exist. This sort of thing was reprobated by Henry Fawcett, who referred to it in strong terms in his "Political Economy." He said: "These restrictions [upon work] can on no grounds be defended," and he went on to say:

"A much greater wrong is caused by preventing men following the employment they have selected. There is no right to which all men and women have a more indefeasible claim than that of an absolute freedom to follow those pursuits in which they are best qualified to succeed. The laws of a free country ought to secure to every one this right, for if it is denied, individual freedom ceases to exist." He (the speaker) thought that apprenticeship might have been dealt with a little more in the discussion, especially as there were people who had great belief that the system would be revived, and that well-conducted boys would work three or four years in shops and become competent workmen. He hoped it might be so. As to a system of partnership for the men, why did not the men develop something of the kind? If workmen did not like the existing system, they were not bound to it, and if they thought they could work better in co-operative partnership, why did they not do so? No client, architect, or surveyor—and, he should think, no builder—would be afraid of such a thing.

The Chairman announced that the next meeting will be held on April 15, when Mr. Walter C. Ryde will read a paper on "The Rating of Public-houses."

The meeting then terminated.

BUILDING BY-LAWS IN RURAL DISTRICTS.*

A DEPUTATION appointed by the Council of the Royal Institute of British Architects waited on Mr. Grant Lawson, Parliamentary Secretary to the Local Government Board, on Tuesday, the 12th inst., to lay before him the views of the Institute on the question of administration of building by-laws in rural districts, which had already been expressed to the Local Government Board in October, 1899, when Mr. T. W. Russell received the representatives of the Institute.

The deputation consisted of the following gentlemen:—Mr. W. M. Fawcett (Past Vice-President), Professor T. Roger Smith (F.), Mr. Lacy W. Ridge (F.), Mr. H. D. Searles-Wood (F.), Mr. E. Guy Dawber (A.), and Mr. W. J. Locke, Secretary.

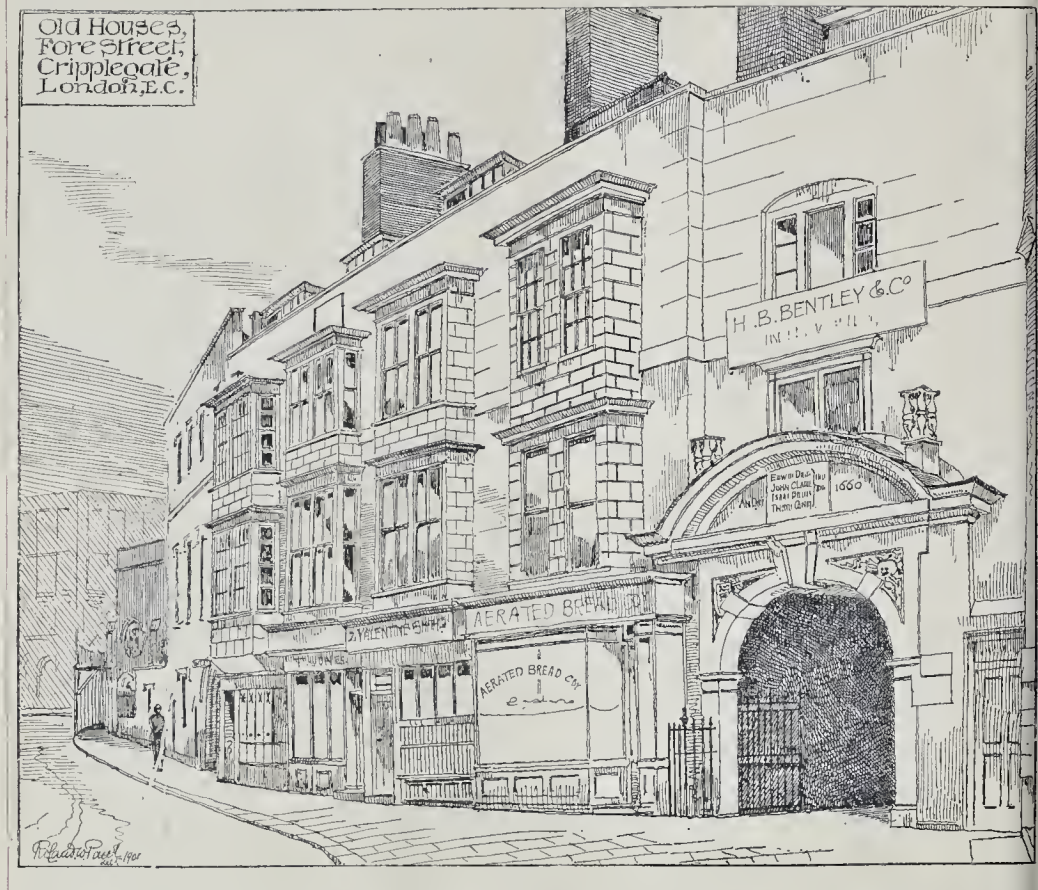
The points submitted to Mr. Grant Lawson had been summarised as follows:—

1. That there has been of late a great increase of interference by public bodies and their officials with buildings in country places.
2. That this has arisen from the Local Government Board having permitted, and in fact encouraged Rural Authorities to take to themselves "urban powers."
3. That such an assumption of powers by a local authority is an unnecessary and vexatious infringement of the liberty of the individual subject.
4. That it is undesirable, except perhaps in public buildings, that Local Authorities should relieve private persons from their responsibility for the soundness and sufficiency of their building construction.
5. That there is no desire on the part of the Royal Institute of British Architects to limit the application of such by-laws as are strictly sanitary in their object.
6. That there is no objection to by-laws as to the width of streets being generally applicable, as they would remain inoperative while a district remained rural.
7. That a complete and efficient by-law as to party walls would sufficiently protect each individual from the danger of fire from his neighbour's premises in country places, in uncrowded districts, and wherever streets are laid out with the width and spaces required by the by-laws.
8. That in such places the minute requirements of the by-laws against fire, founded as they are on the legislation originally passed for overcrowded London after the Great Fire, are unnecessary and vexatious. They are frequently rendered grotesque by the erection of large structures in wood under the form of balconies and verandahs.
9. That the Local Authorities are practically dependent on the Local Government Board for assistance and direction in framing by-laws.
10. That the scheme of the R.I.B.A. is that the Local Government Board should arrange their model by-laws in divisions, and sanction in each district only such as are really needed therein, and so protect the public from vexatious interference in building.
11. That this is a matter to be met wholly by administration within the Board, and does not require legislation.

R.I.B.A. Suggestions for Legislation.

1. That the system for dealing with party walls

* Extracted from the "Journal" of the Royal Institute of British Architects, March 23, 1901.



by the appointment of three surveyors as re-enacted in the London Building Act, 1894, has proved successful during a long period.

That it is desirable that it should be extended to the growing suburbs around the districts of the London County Council, to such towns as are without special legislation on the subject, and to England and Wales generally.

2. That it would be desirable to establish a tribunal of appeal in connexion with the Local Government Board for settling differences which arise as to the meaning of by-laws and building regulations.

That to be of value the tribunal must act with speed and have technical knowledge.

Mr. Grant Lawson, replying to arguments in support of the above points, said that both the President of the Local Government Board and himself were agreed that evils did exist in the present system of administration of building by-laws, and that there should be a difference in the codification of by-laws for rural and for urban districts. The proposals of the Royal Institute had received careful consideration, and since the appointment of Mr. Walter Long and himself efforts had been made as far as possible to adopt them. Mr. Lawson first desired to point out that it was not the function of the Local Government Board to take the initiative in the question of district by-laws; the Board only approved by-laws submitted to them by Local Authorities. It was not in the power of the Board to compel a Local Authority to adopt any particular set of by-laws. As regards encouraging local bodies to take "urban powers," the Board only did so in cases where very insanitary conditions rendered such a course desirable. With regard to meeting the views of the Institute, the Board had drawn up a set of proposed model by-laws for Rural District Councils, on which he invited the opinion of the Institute. These by-laws were scheduled as follows:—

- (a) Interpretation of terms.
- (b) Exempted buildings.

(c) Structure of walls and foundations of new buildings for purposes of health. With respect to the sufficiency of the space about buildings to secure a free circulation of air, and with respect to the ventilation of buildings.

(d) With respect to the drainage of buildings.

(e) With respect to water-closets in connexion with buildings, and with respect to the keeping of water-closets supplied with sufficient water for flushing.

(f) With respect to earth-closets and privies in connexion with buildings.

(g) With respect to ashpits in connexion with buildings.

(h) With respect to cesspools in connexion with buildings.

(i) With respect to the closing of buildings or parts of buildings unfit for human habitation and to the prohibition of their use for such habitation.

(j) As to the giving of notice; as to the deposit of plans and sections by persons intending to construct buildings; and as to inspection by the Council.

(k) Penalties.
(l) As to the power of the Council to remove, alter, or pull down any work begun or done in contravention of the by-laws.

(m) Repeat of by-laws.

Mr. Grant Lawson pointed out that these proposed by-laws were mainly sanitary in their application, and that regulations as to materials and structural details were omitted.

With regard to the request of the Institute for an extension by legislative means of the party-wall system in London to all districts in England and Wales where no special legislation existed, Mr. Lawson said that he could not promise any action this summer, but he would add the subject to the list of Bills which the Local Government Board hoped to introduce at some period during the continuance of the present Government.

The deputation having thanked Mr. Lawson for the courteous action of the Local Government Board in submitting the draft model by-laws for the consideration of the Institute, and

also for the sympathetic manner in which he had received them, then withdrew.

The questions are now before the original committee of 1899, who are preparing a report to the Council.

OLD HOUSES, CRIPPLEGATE, E.C.

ADJOINING the north side of St. Giles' Church, Cripplegate, is a group of old buildings which will probably soon be pulled down. The sketch shows the frontage towards Fore-street. On the right is the entrance to the churchyard of St. Giles' Church, the spandrels of the arch ornamented with an hour-glass and scythe on one side, and a skull and cross-bones on the other. Two hour-glasses are placed as a finish to the pediment, and on a panel below are the names of the churchwardens—Edward Dobson, John Clarke, Isaac Bennett, and Thomas Comry—and the date, AN. DNI. 1600. Eastward are four houses, known as the "four shoppes," with a bay window of two stories to each. The shops themselves have been modernised, and the windows in the bays have been altered. Eastward again is the arched passage leading to the north porch of St. Giles' Church. This forms part of the Quest House, which is partly built over it. Beyond is the chance of the church, now exposed by the demolition of some buildings eastward. The "shoppes" have a quaintly gabled frontage towards the churchyard constructed almost entirely of wood.

SANITARY OFFICERS.—The Local Government Board have sanctioned the appointment of Dr. W. A. Bond, Medical Officer of Health of Holborn, and of Dr. J. J. Allan, Medical Officer of Health of the City of Westminster. They have also sanctioned the appointments of the following sanitary inspectors in the undermentioned Metropolitan Boroughs:—Mr. J. Johnson, Poplar; Mr. W. J. Storer and Mr. E. J. Dillon, St. Pancras.

WESTMINSTER ABBEY.

At Carpenters' Hall, London Wall, E.C., on Thursday last week, Professor T. Roger Smith, the Master of the Carpenters' Company, gave a lecture upon "Westminster Abbey." The chair was taken by Mr. A. Preston, who mentioned that it was eighteen years ago since he brought forward the proposition to hold these lectures, and they had been held continuously ever since. Their success was largely due to the efforts of Professor Roger Smith and the late Professor Banister Fletcher. Professor Roger Smith, whose lecture was illustrated by limelight views, said that a month once asked his guests what they considered the greatest English work of art. The replies were various. One guest suggested Handel's "Messiah," another Turner's great series of landscapes in the National Gallery, and a third mentioned a piece of sculpture. The host, however, disagreed with them, and claimed that Westminster Abbey was the greatest English work of art. He pointed out that its associations were most varied and dear to the English mind, and by its beauty it held a high place among the famous buildings of the world and the highest among those of Great Britain. The early history of the Abbey was lost in tradition, but it was certain that a church stood on the site before the time of Edward the Confessor, who pulled the building down and rebuilt it, so that it was not too much to assert that for considerably more than a thousand years prayers had been offered at this spot. As rebuilt by Edward the Confessor the church covered almost the same ground as it did now, but it was far less lofty. This building was consecrated about 1065, and the other buildings which formed the Abbey itself were erected at the same time, and the church was known as a Benedictine abbey. The taste in architecture changed rapidly and repeatedly between the twelfth and sixteenth centuries, and so complete had the change been between 1165 and the accession of King Henry III. in 1216 that the building had become quite out of fashion. Henry III. commenced to rebuild it in 1220, the rapid growth in architectural taste being a sufficient inducement for him to undertake the task at the time when the work presented far more difficulties than now, and when the cost of the erection was infinitely more formidable. The beginning of the thirteenth century, however, was a great church-building era in Western Europe, men's minds having been stirred by the Crusaders. After the death of Henry III. the work of rebuilding was carried on by successive monarchs, but not with the same energy. Other changes in taste had taken place, and the Abbey showed the effect of them, but not in a marked degree, the heights and proportions fixed in the thirteenth century being adhered to. The lecturer then showed views of the Abbey. The first was a ground plan, and he pointed out where the old gate-house used to stand which was a considerable number of years was used as a State prison. The next views depicted the interior of the Abbey from various standpoints—the end of the north transept, which had practically been rebuilt in our own time; the outside of Henry VII. Chapel, which possessed great interest as being a specimen of essentially English style; the flank wall of this chapel, giving a view of part of the cloister and showing some of the buttresses which support the walls and resist the pressure of the roof; and a view of the avenue in the cloisters where the monks played in order to lighten the tedium of their life. A picture of the Chapel of the Pyx was next shown, and Professor Roger Smith explained that this was the place where the image used to be tested. He said every precaution had been taken in the way of locks, but as an additional safeguard a skin, which was believed to be a human skin, had been placed over the door. Views of the Chapter House were given, with the Jerusalem Chamber, in which the Old and New Testaments were revised. The lecturer then showed views in the Abbey itself—the beautiful transepts, the organ screen, the choir stalls, the altar, the Chapel of Edward the Confessor, the Coronation chairs, and the outside of the special place where in olden times were kept the wax effigies of notable persons which, when those persons died, were taken round the streets as proof of their death. There were still six or seven remaining in various stages of decay, the least decayed being that of Nelson. Views were also given of some of the stuary, which

the lecturer said was sometimes out of keeping with the style of the building, but the Abbey was so lofty and beautiful that these did not have any effect.

A vote of thanks concluded the proceedings.

THE ART OF FRESCO PAINTING IN ITALY.

IN connexion with the Incorporated Institute of British Decorators, Dr. George C. Williamson, the editor of Bell's Handbooks of the Great Masters, delivered a lecture on Monday evening at the Painters' Hall, Little Trinity-lane, City, upon "The Art of Fresco Painting in Italy." The President of the Institute, who was in the chair, mentioned that during the two years since the Institute had been incorporated, the membership had reached 350.

Dr. Williamson said the subject was so vast that he was obliged to omit the early history of fresco altogether. In the first place it was necessary to explain exactly what fresco work was. Fresco buono, or true fresco, was painted upon wet plaster with colours that were mixed with water or lime-water, and there was also fresco secco, which was painting upon dry plaster. Tempera painting in Italy, although not true fresco, was often done. Generally some fluid or gelatinous substance was used with the colours, such as egg, size, or gum. Fresco and tempera painting were very ancient arts; paintings on plaster were found in Egypt, Babylon, Greece, and very largely in the tombs of Etruria, and apparently it was a favourite form of indoor mural paintings. There were certain broad advantages and disadvantages with regard to buono and secco fresco. The disadvantage of the secco was that it would not bear exposure to the weather, and that the colours could be rubbed off; but, on the other hand, it could be painted leisurely. With buono fresco the work had to be done hurriedly, and only a certain portion of plaster was put on at a time, so that the artist could paint upon it before it dried. The painting upon wet plaster was the most lasting, as the colours crystallised with the plaster. There was no true fresco work in England, but there was some partly fresco and partly tempera in some of the ancient churches. In Italy the art assumed far greater importance than it ever did in England, even down to the time of Raphael. In the thirteenth century Giotto was practically the great beginner of the art of fresco painting in Italy. His pictures in Florence of the "Slaughter of the Innocents," "Chastity," "Obedience," and others showed his great ability to tell a story, and his desire to do so clearly by introducing as few figures as possible. The drawing was crude and the figures stiff, but he showed a strong wish to put as much character as possible in the faces. In the early part of the fourteenth century fresco showed a considerable improvement. There was an effort on the part of Orcagna, Altichieri, Fra Angelico, &c., to show the pictorial importance of a picture—a stronger attempt at dramatic power, and an effort to represent all the figures as taking part in the central scene. At this time a good deal of the work was done in tempera. Fra Angelico was one of the greatest painters in fresco work. His "Crucifixion," with the figure of St. Dominic at the foot of the Cross, was full of sweetness and simplicity. His picture of our Lord as a pilgrim, and the representation of the Lord's Supper, which was to be seen in the Convent of St. Mark, were also splendid specimens of the work of this devout artist. The background to his pictures was always a representation of parts of the convent in which he lived and worked. Following him came Masolino, whose picture, "Tribute Money," showed two or three different scenes in one fresco; and Benozzo Gozzoli, who introduced a great deal of colour, and natural objects. Coming down to 1470 we saw more and more tempera work, and the introduction of the classical style. Then about this period it was the habit of rich families to entrust an artist to decorate their private chapels with frescoes. Contemporary portraits were introduced in the pictures, sometimes representing the donors as taking part in scenes which happened hundreds of years before. The golden period followed, commencing with Leonardo, who made the experiment of painting with oil, with a very deplorable result. At this time, also, sketches were first made, and the cartoon, pounce, and stylus were used. Then came the

great Raphael, in whose time fresco work reached its highest point, and next the period of Michelangelo, when pagan art was carried into sacred subjects. Fresco work afterwards deteriorated very much with the Venetians, who simply used it to decorate the outside of palaces and private dwellings, and it became mythical, without detail and without power.

In the course of the lecture views were shown illustrating the work of Giotto, Orcagna, Altichieri, Masolino, Fra Angelico, Benozzo Gozzoli, Lippi, Raphael, Leonardo, Luini, Michelangelo, Correggio, &c.

The Master of the Painters' Company proposed a vote of thanks to the lecturer.

The Bishop of Rochester seconded, and the vote was carried.

WASHINGTON AND ITS NEIGHBOURHOOD.

THE following is the historical sketch of the history of the architectural development of the city of Washington and its surroundings, drawn up by Mr. Glenn Brown, the Secretary of the American Institute of Architects, and referred to in our Note on page 206 ante. We give it as an example for other cities and governments. It will be observed that Mr. Brown comments strongly on the mistakes which have been made through allowing improvements to fall into the hands of isolated persons, each working his own pleasure, instead of proceeding on a broadly defined general scheme:—

"The original plan of the city of Washington was matured by Peter Charles L'Enfant, after studied investigation of the site by George Washington and himself, and after a careful consideration of the existing as well as many proposed plans of the Old World cities. In the preparation of this plan the location of the buildings and parks were mapped out on broad and effective lines, so as to attain harmony as well as utility in grouping the whole scheme into one unit.

Prominent points were selected for the principal buildings and proposed monuments. Stretching from the site of the Capitol to the site of a proposed monument, the broad reach of the Mall was planned, and crossing at right angles to this site was the axis of the Executive Mansion and park. Radiating streets from central points with buildings or monuments at the end of pleasing vistas formed another feature of special beauty. The fundamental idea of the scheme was a dignified, formal, and artistic approach and setting for these principal architectural monuments. The plan does not appear to have been copied from any existing city. The radiating streets and vistas of modern Paris were all devised under the two Napoleons, and L'Enfant's and Washington's plan was drawn in 1791.

The plan of the streets with their noble vistas and the outlines of the park system were executed, and the Capitol and Executive Mansion were built on the sites selected. From this point in the development of the city of Washington to the present day the idea of a general and harmonious scheme seems to have been forgotten, and the landscape of each section of the Mall has been treated as if it were an individual park and had no bearing or effect upon the Capitol, Monument, or Executive Mansion. Although these parks may in one or two instances be beautiful in themselves, the object and end of the original designer has been ignored, and the country has lost the opportunity of seeing one of the grandest architectural and landscape effects which has ever been devised.

The general design suggested buildings on the north and south of the Mall which was evidently intended to be an open space with boulevard ornamented with planting, sculpture, and objects of art similar to the grand openings in Versailles and Fontainebleau, which gives such magnificent views of the buildings and forms such a far-reaching vista of exquisite beauty. Instead of following this grand scheme as devised, our Government buildings in Washington have been located wherever whim, fancy, or local interest dictated at the time of their erection. The effectiveness of vistas on the avenues has been destroyed; the utility, unity, and grandeur of massing or grouping such structures has been ignored, parking destroyed, and the building of noble structures scattered without design or reason. This is much to be regretted, as the money expended

on such buildings could have easily produced unsurpassed effects.

The early Presidents—Washington, Jefferson, and Madison—took an active and painstaking interest in the design of our early buildings, as well as in the general plan of the city. Being cultured men, they in no instance failed to search out and employ the most talented men in the profession to take charge of Government work, and did not fail to insist upon adhering to Thornton's plan of the Capitol, Hoban's plan of the Executive Mansion, and L'Enfant's plan for the city. They did not seek for novelty in details, but strenuously insisted on the execution of the work in accordance with the academic forms of architecture as practised in that day. In after years the buildings and park treatment were delegated to separate individuals, who appear to have thought their own project the only one to be considered, and all unity of effect has been lost. Since the time of L'Enfant we have added to the park system the Riverside Park by reclaiming the flats, the Zoological and Rock Creek parks, and the Arlington estate, on the south side of the Potomac, by purchase.

We now need for Government and municipal service many new structures for Washington City. The old park system is undeveloped except in limited places, and in no instance with reference to the buildings. The new park system is undeveloped, and the sites for contemplated buildings, bridges, and statuary are unselected. The proper grouping of buildings so as to expedite the work of the various departments, to attain prompt and easy communication between departments of the Government in which business requires frequent interchange of duties, is as important as a system of grouping to attain artistic effect. The executive departments should be of easy access to the Executive Mansion and to each other. The various scientific departments should form another group, the courts probably another group, and buildings necessary for the convenience of Congress should be grouped in connexion and harmony with the Capitol.

Now is the time, on the hundredth anniversary of the foundation of the Capitol, to consider the propriety of another plan on which future buildings shall be erected, by which parks shall be laid out so as to enhance the effect and beautify the buildings, and by which grouping of monuments may add to the effectiveness of the whole. Now is the time for a general plan for connecting the park system, as well as devising the broad principles on which all parks shall be treated, which shall have a formal treatment, which shall be treated broadly for river and distant effects, and which shall be treated naturally because of their natural and picturesque beauties. To attain this end we feel that it is necessary to put the method of securing, selecting, and supervising such a scheme in the hands of a body of men eminent in the professions of architecture and landscape architecture, as this work is purely a question of artistic judgment in the departments of architecture and landscape treatment.

The artists of this country have shown themselves capable of producing effects surpassing those of other nations in the temporary work at the World's Columbian Exposition, where the work was laid out and carried into execution by a board of architects, landscape architects, and sculptors. It is a sad commentary on our present methods that we have in Washington no work by the architects, painters, or sculptors who have accomplished work on a par with similar work in other portions of the world. While in the earlier periods of our history the various classes of work in Washington were always represented by the most distinguished men in their various branches, in recent years our men honoured abroad in Paris are unhonoured in our capital city.

By a commission of the character called for in this resolution we would have a body capable of selecting the designs, or the men who would be most capable of producing the effects to be desired.

The opportunity is too great to be cast aside. No country has a building more noble, grand, or beautiful than the Capitol, a shaft more imposing than the Monument, a free space between these buildings greater than the Mall; with such an opportunity to treat it so as to enhance the effect of the Capitol, the Monument, and the Executive Mansion; No country has such a monumental structure as the proposed Memorial Bridge; let this

be located so as to enhance most effectively the treatment of the Mall.

There are few more pleasing bits of landscape than the broad Potomac, stretching south of Riverside Park, with the hills of Virginia and Maryland on either side, with the beautiful colours of foliage in spring, summer, and autumn. How to treat this so as to enhance and emphasise the natural effects is a worthy subject for the highest genius. The National Zoological Park and Rock Creek Park are picturesque in the highest degree. Great skill, as well as a love for nature, requires that nothing should be done to jeopardise their natural beauties, but make them accessible and bring them into view, so they may be enjoyed. The most advantageous methods of connecting these parks needs also careful consideration.

We believe that the ends suggested in this Report can only be attained by the appointment of a commission such as is embodied in this resolution."

CONFERENCE OF AUSTRALIAN ARCHITECTS.

A CONFERENCE of architects was held at Sydney commencing on the last day in December, 1900. The Conference met on December 31, at the Institute's rooms, Vickery's Chambers, 82, Pitt-street, and on the motion of Mr. Edward Davies, President of the South Australian Institute of Architects, Mr. John Barlow, F.R.I.B.A., President of the Institute of Architects of N.S.W., was unanimously elected chairman of the Conference. On the motion of Mr. H. A. Wilshire, Messrs. Thos. Watts, Past-President of the Royal Victorian Institute of Architects; E. Davies, President of the South Australian Institute of Architects; C. W. Chambers, President of the Queensland Institute of Architects; and W. F. Cavanagh, Vice-President of the West Australian Institute of Architects, were unanimously elected Vice-Presidents of the Conference. Mr. A. B. Black, Hon. Treasurer of the South Australian Institute of Architects, moved, and Mr. A. B. Wilson, A.R.I.B.A., Queensland Institute of Architects, seconded, that Mr. G. Sydney Jones be elected Hon. Secretary of the Conference, which was carried unanimously.

The following delegates were present:—From the R.V.I.A.: Messrs. Thos. Watts, W. R. Butler, J. A. B. Koch, D. C. Askew and F. A. Fitts; From the S.A.I.A.: Messrs. E. Davies, A. B. Black, M. S. Clark and Sydney Jackman; From the Q.I.A.: Messrs. C. W. Chambers, A. B. Wilson, R. S. Dods, W. C. Voller and E. M. Myers; from the I.A. of N.S.W.: Messrs. J. Barlow, G. Sydney Jones, G. Allen Mansfield, H. C. Kent, Jas. Nangle and others.

After some formal business had been transacted, the proceedings were adjourned until Wednesday, January 2, when the chair was occupied by Mr. John Barlow, and papers on the "Proposed Federation of Australian Architects" were read by the Chairman and Messrs. E. Davies, C. W. Chambers, and Charles Rosenthal, A.R.V.I.A.

In the discussion which followed, the Chairman said that it was for the meeting to determine whether the Federation of Architects proposed was to take the form of a Federal Council or a Federal Institute.

Mr. A. B. Wilson said a very good suggestion had been thrown out by Mr. Rosenthal that Commissions should be appointed, although it seemed to him that they must not go too fast in this matter, but must feel their way carefully. The idea of a central institute was also a good suggestion. The speaker found that the best return he could get for his subscription to the R.I.B.A. was a copy of the Transactions, as it gave one an idea of what was being done in Great Britain, and information could be obtained by this means which otherwise would be lost altogether. The question of the Federal Council had been occupying their minds for a considerable time, and he would like to know if the Government of New South Wales had in any way recognised the Institute of Architects.

Mr. Watts thought the difficulty would be to bring about this federation. He himself thought it a very desirable thing. All knew that union was strength, and he had found in Victoria, before the Institute had been founded there, that architects were without any influence at all, but as soon as they had formed themselves into a society they spoke with more authority, and brought themselves to bear upon

the Government and all bodies contemplating building. Being separated by such immense distances was, to his mind, the difficulty in their co-operating, for if they did form such an association each colony would have to appoint delegates. However, they were to get united, and make their influence felt and wishes known in the different colonies.

Mr. Askew said when they all became federated they would have to work in all the colonies and not separately, and, therefore, they must have uniform charges. If the council were formed it would be the final court of appeal, and the institute of each state would have to submit to it. He would suggest that representatives from each colony be appointed to thresh the matter out, and report to the Conference at a later date.

Mr. Rosenthal said it would mean weeks and perhaps months of labour before a proper system could be arrived at, but he thought that the question of an Australian Institute should be considered. Let them all bear the same name and be members of the one brotherhood.

Mr. Watts moved and Mr. Chambers seconded:—

"That, in the opinion of this meeting, it is desirable that the architects of Australia form a Federal Institute."

The motion was carried unanimously.

Mr. Tolhurst moved and Mr. Askew seconded:—

"That the chief delegates from each state be appointed by this meeting to form an outline scheme of what is proposed to take before the Conference, for the purpose of submitting the same to the Institutes of the respective states."

Mr. Addison moved the following amendment:—"That one delegate from each colony be appointed to the committee."

The amendment was not seconded, and the motion on being put was carried.

Mr. Chambers proposed and Mr. Davies seconded:—

"That the report of the delegates upon the Federal Institute of Australasia be received on Saturday morning at ten o'clock."

The motion was carried unanimously.

Papers on "The Promotion of Architectural Education and a Travelling Scholarship" were then read by Mr. A. B. Black, on behalf of Mr. R. J. Haddon, Mr. Rosenthal, and Mr. Blacket, F.I.A. of N.S.W. (read by the Hon. Secretary).

On reassembling in the afternoon, the discussion on the question of "The Promotion of Architectural Education and a Travelling Scholarship," was resumed.

Mr. Butler, speaking upon the matter of Federal Scholarships, moved:—

"That this Conference heartily approves of the suggestion to establish a Federal Scholarship, and desires that the Federal Council shall give the matter its first consideration."

Mr. Chambers seconded the motion, which was carried unanimously.

Papers on the subject of "Investigating the Strength of Australian Building Materials" were read by Mr. A. B. Wilson and Mr. Nangle.

Mr. Wilson then moved, and Mr. J. J. Clark seconded:—

"That should the proposed Federal Institute become an accomplished fact this Conference communicate with the Federal Institute asking them to take the question of obtaining information as to the quality of Australian building materials into their early consideration."

The motion was carried unanimously. At the third sitting on January 4, the following paper on "The Conduct of Competitions" was read by Mr. G. H. M. Addison:—

"This Congress has presumably been inaugurated with the one main object of forming an Australian Federal Institute. To help towards this end, it is well that we should exchange views on the general principles underlying those subjects which at an early date will have to be dealt with by the Council of the Australian Federal Institute. Not the least important of these will be the conduct of competitions. It is our misfortune that, owing to our profession having no authoritative recognition, there has been no general body powerful enough to enforce such a high ethical professional code as exists in the legal and medical professions. Nothing seems to me to stand so seriously in the way of the formation of such an ethical code as the lax conduct of competitions. A struggling architect, whose one chance of immediate prosperity is to win an important competition, is too often

aced with this difficulty, viz., that the conditions are such that he must leave the chance untouched, waste his time in a hopeless effort, or adopt means towards success against which his better nature revolts. Probably we have all of us at times been shocked by hearing some of those whose education and professional standing should make them leaders of correct thought, openly excusing doubtful practices in connexion with competitions. This reason, if there were no other, should be sufficient to put the question of competitions in the front rank if those to be discussed by the Federal Council. In this relation the first question will be as to how far the Federal Institute should countenance competitions at all. It is certain that in the past but few first-class architectural results have been achieved by competitions, and few committees or individuals who have since organised a competition are prepared to repeat the experience. This is due primarily to the absurdly loose way in which conditions of competitions are drawn up, but, to a certain extent also, to a defect in the system itself. The competing architect has not a free hand in solving the problem before him, but is subject to restrictions placed upon him by some one who may often be less capable than himself, and who generally will have given much less attention to the question than incumbent on a competing architect. Consequently a design is produced below the full powers of the designer. Competitions, on the other hand, offer the young architect an earlier opportunity of showing his ability than would otherwise be likely to accrue to him, and also have some effect in rousing the older practitioners out of long, successful practice. It will probably be conceded then that while competitions for ordinary buildings should generally be discouraged, for public buildings they are an advantage when wisely conducted, and for such buildings no pains should be spared to gain perfection. Probably the best results could be obtained by having first a competition for plans only, and after paying well for these, issue the accepted plans, with as much criticism as is deemed necessary, in a competition for the completed building. The successful objects in the two competitions might then be appointed conjointly to carry out the work. In any case the aim in formulating conditions could be in the first instance to minimise the work of the competing architects. Whether this best result is accomplished by eliminating perspectives doubtful. Perspectives give the simplest method of showing the real effect of the finished building, which can only be got from plans by a very practised critic. Conditions often fail in their desired object by being precise in laying down under penal conditions the accommodation demanded. In most cases a description of the accommodation required, leaving the architect a free hand in providing it, would lead to better results. The estimating of cost is one of the great difficulties facing the adjudicator, and the results too often lead to disappointment. Fairness to competing architects, the conditions should indicate what method of estimation of cost is to be adopted. A professional adviser appointed by the Federal Institute, whose decision should be final at least regarding the payment of premiums, is an essential stipulation, and it would be well if such an adviser revised the conditions before they were issued. The question so often raised regarding the states of the right of civil servants to compete does not seem to me an important one. To enter a competition may be looked upon as tantamount to applying for the work, which no other service should be a bar, in the case of Government work, however. It is clear that no Government servant, by his position, has a knowledge of the preliminary work done in connexion with such a competition would feel justified in competing above points, which seem to me the most content, I have merely touched upon. I content, in that in such a gathering as this, and in a short time at our disposal, we cannot hope to more than express our opinions on main principles, leaving details for discussion in smaller committees. The practical suggestion in which I will close is that the Federal Institute carefully lays down principles on all points necessary to satisfactory conditions of competition. That it then be insisted upon that conditions for any competition be submitted to the local Institute and be endorsed by them as satisfactory, embodying those principles, before members of the Institute shall

compete. It must not be forgotten that competitions are impossible if architects will not compete, and by loyalty to each other we can soon remove all the evils of the system that are capable of removal."

Mr. Clark said he was not prepared at that juncture to enter into a discussion on the question of competitions. His general experience, which might embrace half-a-dozen Government competitions, had been that the work was always thrown away. If they could in some way or another touch upon the principle of the Government giving the work out, as proposed by their President, to architects, it would seem to him to be the only method of meeting the case effectually.

Mr. Butler thought it was hopeless for them to enforce any rules with regard to the conduct of competitions, and that it was best for them to follow exactly on the lines of the British Institute of Architects.

Mr. Askew moved, and Mr. Tolhurst seconded:—

"That one of the first matters to be dealt with by the Federal Council be the consideration of drafting conditions of competitions, especially with relation to the designing of important Government works."

The motion was carried unanimously.

On resuming the sitting in the afternoon, papers were read on "The Question of the Amount of Work carried out by State Governments to the detriment of Architects in Private Practice" by Messrs. A. B. Black and William Kenwood, R.I.A., N.S.W.

Mr. Butler thought the cause of the present state of things was largely because in the early days there were very few skilled architects in the colonies, and the sooner they could formulate their Federal Institute, train their men better, create a School of Architecture, and show the Government that they could do work better than the Government, they might be able to do more with the latter.

Mr. Clark moved, and Mr. Askew seconded, and it was agreed: "That it be an instruction to the Federal Council of Australian Architects to bring under the notice of the Federal Government the advantages of distributing the Government buildings throughout the profession instead of being confined exclusively to the Government Departments."

At a subsequent sitting a letter was received from the Builders' and Contractors' Association of New South Wales advocating uniform conditions of contract.

Mr. Cavanagh thought the suggestion was an excellent one, and he moved: "That the letter from the Builders' and Contractors' Association be acknowledged, and it is recommended that it receive the early consideration of the Federal Council." The motion was carried unanimously.

The Committee's report as to the formation of a Federated Institute of Australian Architects read as follows:—

1. It having been decided that the various State Institutes combine under federation, the delegates suggest that the Federated Institute be named "The Institute of Australasian Architects," and that steps be taken to obtain a Royal Charter entitling the use of the prefix "Royal."

2. Delegates suggest that the expenses of management of the R.I.A.A. be met by a percentage of the subscriptions collected by the State Institute.

3. That a committee of five members of the Institute of Architects of New South Wales be appointed by the delegates to draw up rules, regulations, and code of by-laws, and submit to the several Institutes for approval or amendment as soon as possible, and that any amendments or suggestions made by any Institute be submitted to each of the other Institutes for consideration, and returned by them in due course to the Federal Committee.

4. The objects to be:—

(a) The advancement of architecture.
(b) Uniformity of Australasian practice.
(c) Examination of applicants for membership after six months from incorporation.
(d) The general settlement of all matters affecting the mutual actions of State Institutes.

It was agreed that Clause 1 be passed.

A short discussion was entered into on Clause 2 regarding the payment of subscriptions, it having been suggested that the fee be *per capita*.

Mr. Black moved and Mr. Cavanagh seconded:—

"That Clause 2 be amended to read as follows:—'Delegates suggest that the expenses of management to the Royal Institute of Australian Architects be met by a levy *per*

capita of the subscriptions quoted by the State Institute.'"

The amendment was carried unanimously. Mr. Askew moved and Mr. Rosenthal seconded:—

"That Clause 3 be amended to read as follows:—'. . . and that the committee above mentioned be composed of Messrs. J. Barlow, Kenwood, and Jones, of the Institute of New South Wales, and two other members to be nominated by the Council of the New South Wales.' This was agreed to.

Mr. Cavanagh moved an amendment to Clause 4 (Section c), to read as follows:—

" . . . but that the Council be allowed to waive the examination in the case of any architect whose work may be of such a nature in their opinion as to entitle him to be admitted to the privileges of full membership."

The Chairman said it would be an insult to men coming from England and America to ask them to submit to any examination of any kind.

Mr. Cavanagh thought a man should be compelled to reach a certain standard before he could become a member. This was what they required to give them the standing in the eyes of the public that they should have.

Mr. Kenwood was sure that on the present occasion they were trying to elevate their profession, and if they were going to elevate their profession they must do it by examination. He certainly believed that they would not have to submit all their Fellows at the present time to that means, but in the future every one would have to undergo an examination.

Mr. Rosenthal agreed with the system of examination, and said that it might never occur that a man from England or any other part of the world would be asked to submit to this examination.

The motion was carried unanimously.

Mr. Addison moved an amendment to Clause 4 (Section d), which was seconded by Mr. Black:—

"That each Institute in the federation be allowed to enjoy the fullest measure of self-government subject only to the fiat of the general body in all matters affecting the welfare of the profession generally." This was agreed to.

It was moved by Mr. Butler, seconded by Mr. Askew, and supported by Mr. Chambers, that the following be an addenda to Clause 3:—

"That the Committee appointed to draw up the draft regulations for the formation of the R.I.A.A. be named the Federal Institute Committee, and that it be asked to arrange for an Inter-State Conference of Architects in Melbourne at the time of the opening of the first Federal Parliament and submit draft regulations to that meeting." This was also agreed to.

Mr. Tolhurst moved, and Mr. Addison seconded, and it was agreed:—

"That the President and Secretary, with power to add to their number, be requested to prepare and present an address to His Excellency the Governor-General expressing all the sentiments embodied in the draft address herewith."

At the conclusion of the proceedings a vote of thanks was passed to the Chairman.

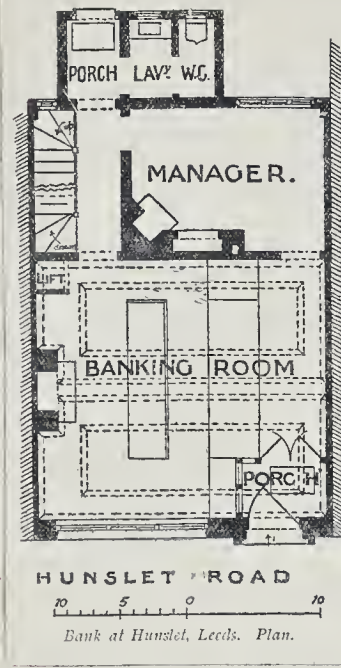
Mr. Cavanagh, on behalf of Western Australia, referred to the splendid way in which they had been treated, and congratulated the Institute of Architects in New South Wales for doing the greatest action that had been done yet in connexion with the profession of architecture in Australia. They had started to erect the profession of architecture on a sound basis, and hoped to establish it in Australia even on better ground than they had in the United Kingdom.

Mr. Barlow thanked them heartily for the warm manner in which they had recognised the work which the Institute of Architects of New South Wales had done.

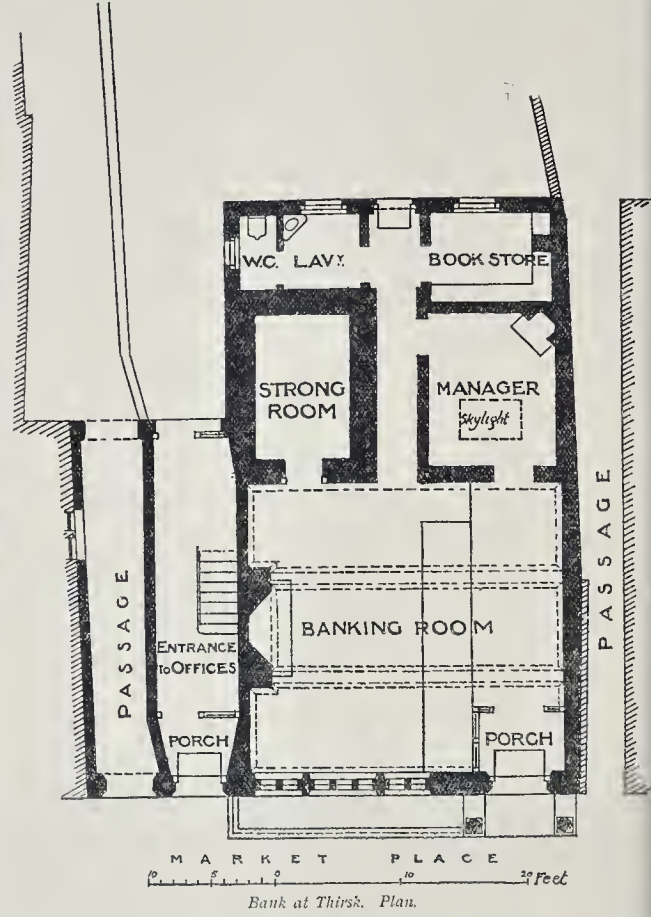
After votes of thanks to the honorary secretary (Mr. Sydney Jones), the proceedings closed.

On Thursday, January 3, the Institute of Architects of New South Wales gave a banquet in honour of the delegates to the Conference of Architects. The function was held at the Café Français, Mr. John Barlow being in the chair.

[We are indebted to the *Building, Engineering, and Mining Journal* of Sydney for the above report of the proceedings of the Conference.]



Bank at Hunslet, Leeds. Plan.



Bank at Thirsk. Plan.

Illustrations.

PUGIN STUDENTSHIP SKETCHES.

THIS sheet of sketches is reduced from one of the frames of drawings sent in to the Institute of Architects by Mr. H. W. Cotman, who gained the Pugin Studentship this year.

In regard to the sketches Mr. Cotman writes:—"This sheet of drawings indicates the variety of work submitted by me in this competition last year. I think nearly every pencil sketch I ever did went in, except when both sides of the paper were sketched on and one had to be sacrificed.

The doorway at Audenarde, of which the lower part is represented at South Kensington (and also at the Crystal Palace), is by Paul van Schelden, 1531. The upper part is rather coarse and out of keeping with the rest, which is exceedingly refined and playful in detail. The children's figures are beautifully proportioned. There are doors in each of the three sides opening into the council chamber.

The Italian chimney-piece is in the South Kensington Museum. The supporting men under the brackets are rather weak, being on tip-toes. The detail is curiously fanciful and in bold relief.

The little walnut table is one of the most interesting things in the woodwork corridor at the South Kensington Museum.

The west front of Wells Cathedral, the result of a week end trip, needs no comment." Mr. Cotman is quite right as to the variety of his sketches. They formed, when all exhibited together, a collection very noteworthy in this respect.

PRESBYTERIAN CHURCH, NEW HAVEN, CONNECTICUT.

THE exterior of this church is designed in Italian Renaissance; it is finished in granite and limestone, with pressed buff brick; all cornices and the lanterns of the towers will be of copper.

The basement, which is entered by two doorways in the tower, has a large vestry, room, reading-rooms, &c., connecting directly with the Sunday schoolroom on the rear of the lot.

The audience-room is without gallery, and great attention has been given to studying out the details of all parts of the interior treatment. This room has an inclined floor, and will seat 700 people.

The organ is also of special design, by the architect, Mr. F. R. Comstock, of New York City.

NEW TOWN HALL, HITCHIN.

We give a view and plan of this pleasing little Town Hall, which has been carried out from the designs of Mr. G. Lucas, of Hitchin (who obtained the commission as the result of a competition), with Mr. E. W. Mountford as consulting architect.

In the design the main object was to bring the building into line with such fine houses as the old Brewery House in Sun-street, or the smaller houses of like character in Bridge-street, as well as others about the town. In this way the work was kept as inexpensive as possible for a building of this size and importance, and it was hoped to bring out a note of harmony between the old and the new, suiting the building to its surroundings. The roof is carried by steel trusses, which do away with all thrust, and reduce the load to a dead weight.

The body of the hall provides for fifteen rows of twenty chairs each, and fifteen rows of benches each with twenty-two seats. The gallery has six rows of benches, each providing twenty-four seats, and two smaller ones, giving a total capacity of 780 seats, exclusive of stage and standing room.

The following is a list of the various firms engaged in the building, or from whom articles were obtained:

General contractor, Mr. S. Rodhouse; mason's work, Mr. James Pepper, Hitchin and Shefford; bricks, Messrs. Wheatley, Henlow; steel roof trusses, Messrs. Drew, Bear, Perks, & Co., London; roof tiles, Mr. A. F. Love, Sandy, Beds; plasterer, Mr. Thomas Walker, Arlesey; gas-fittings and general ironmongery, Mr. George Redhouse, Baldock;

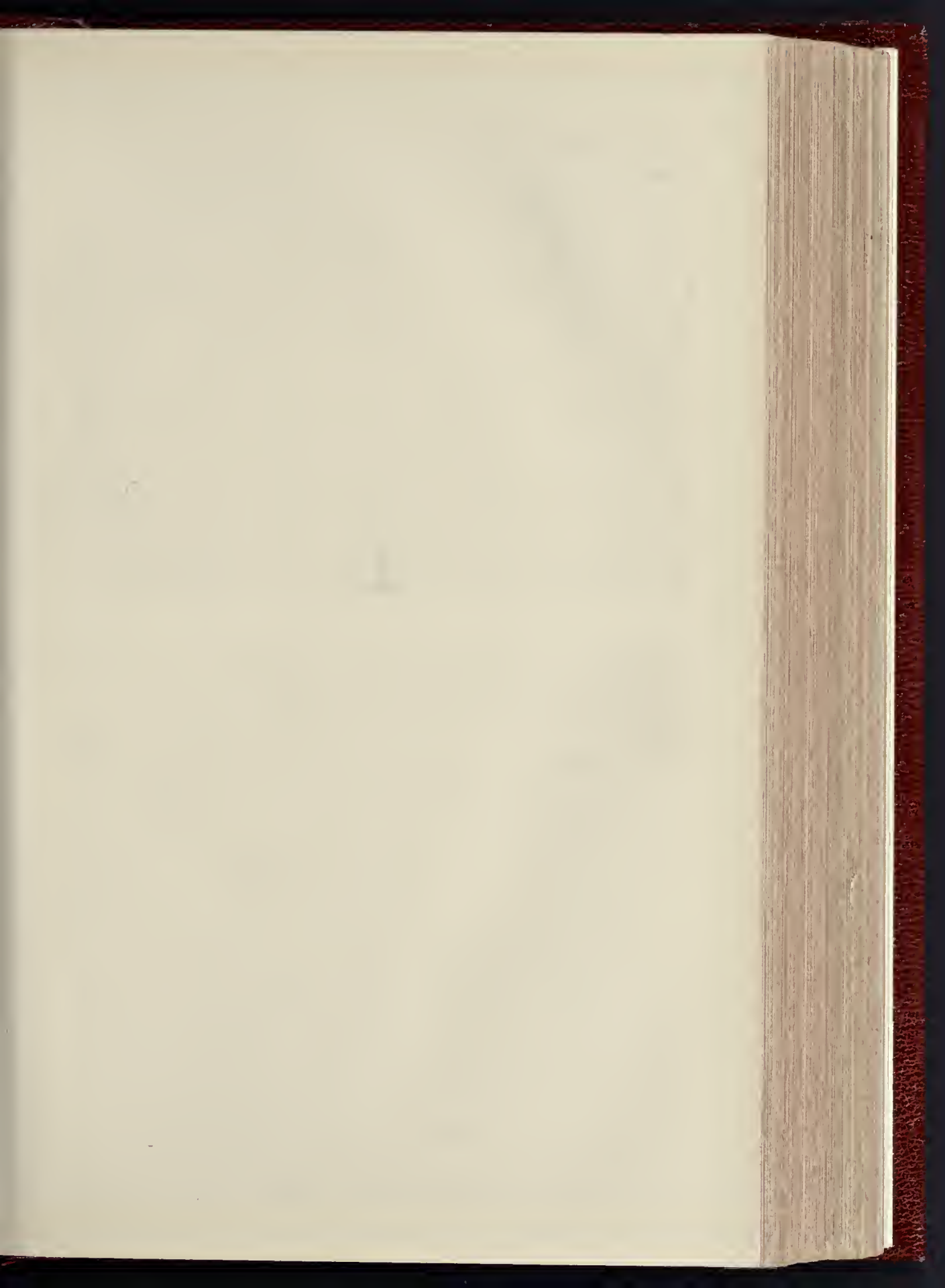
heating apparatus, Messrs. C. Kite & Co., London; stoves, rain-water heads, gas pedants and brackets, Messrs. T. Elsley, Limited, London; ornamental plaster work, Mr. Gilbe Seal, London; iron casements, Messrs. Crittal & Co., Braintree; plumbing, lead-glazing, and glass domes, Messrs. Jenkin, London; lavatory fittings, Messrs. J. Tyl & Sons, Limited, London; iron railings and chains for hall, Messrs. Galward & Son, Limited, Hitchin; tiles for fireplaces, Messrs. M. Van Straaten & Co., London; speaking tubes, Messrs. Sheath Bros., London; door furniture and panic bolts, Messrs. Charles Smith & Sons, Limited, London and Birmingham; glazing in yard, Messrs. Rendle & Co., Limited, London; asphalt for flats, Val & Travers Company, London; gallery seats and fittings in cloakroom, Mr. Joyner, Hitchin; benches for hall, Mr. Taylor, Luton; curtain throughout, Mr. F. W. Phillips, Hitchin; incandescent gas bye pass supply, Mr. W. I. Phillips, Luton.

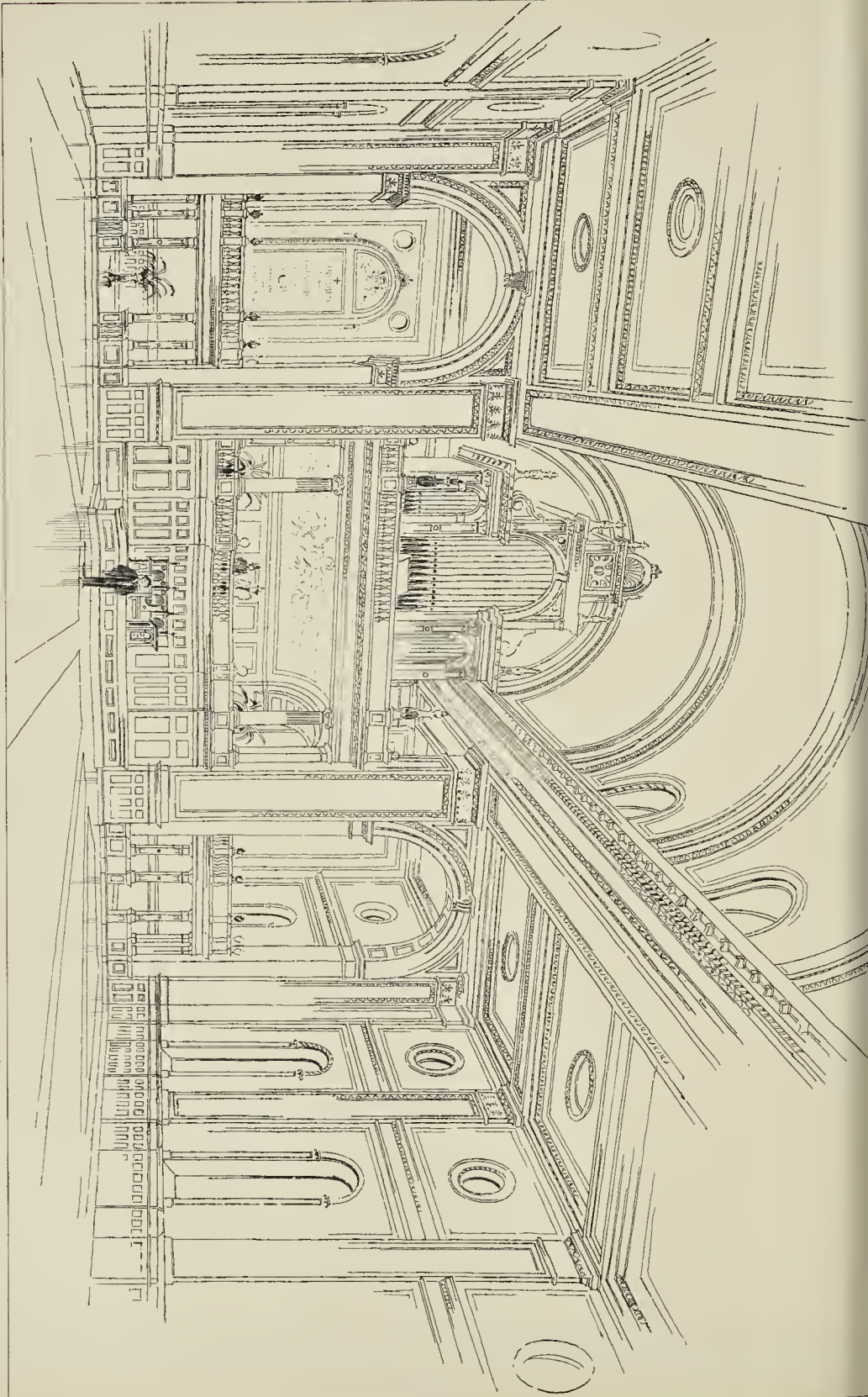
TWO COUNTRY BANKS.

THE Bank at Thirsk for the Yorkshire Banking Company, stands on the east side of the old-fashioned market-place. It is built of Portland stone, with a red-tile roof. There are two suites of offices, which are let off on the first floor, and the caretaker-rooms over.

The contractors were:—Masons, Messrs. Wm. Nicholson & Sons; plumbers, J. Lindley, plasterer, T. Moore; tilers, Messrs. Watson & Worsnop—all of Leeds; and joiner, J. D. Rucroft, of Thirsk. The Bank panelling and fittings, which are of walnut, were made by Christopher Hodgson, of Northallerton.

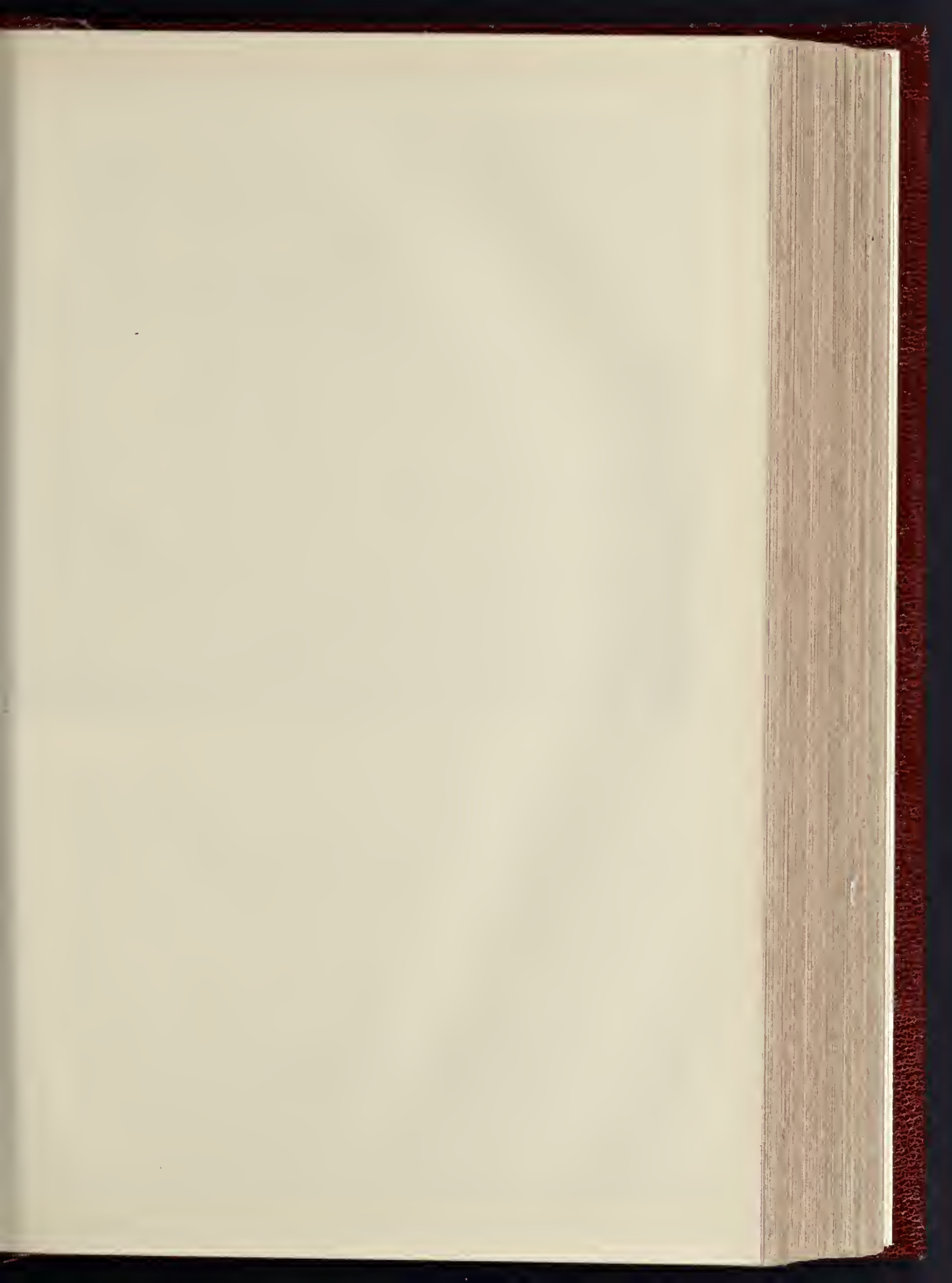
The bank at Hunslet is a small branch of the Yorkshire Banking Company in the busy manufacturing district of Leeds, and distant





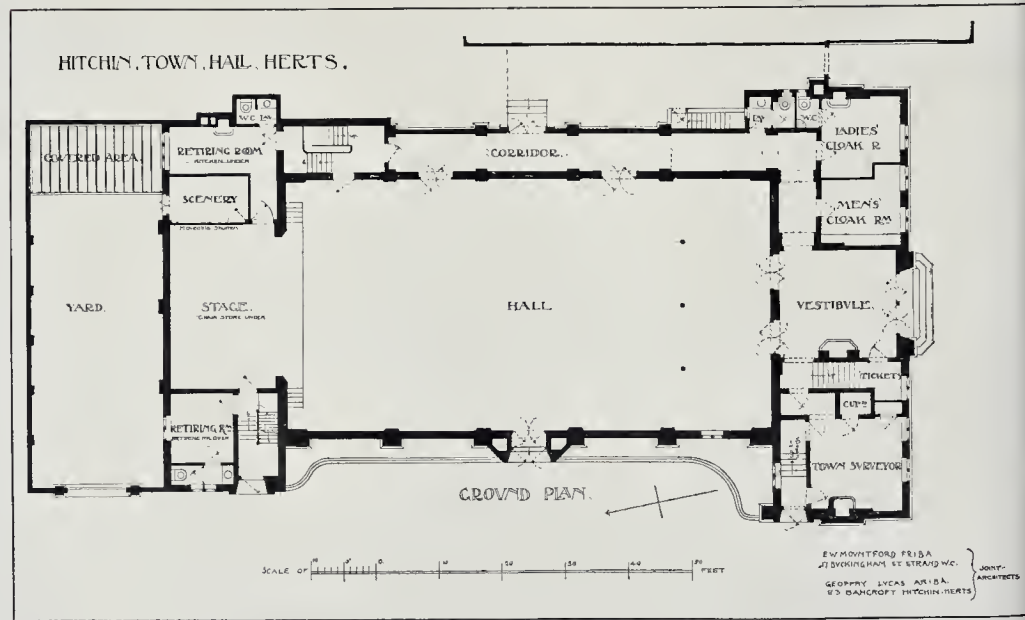
PRESBYTERIAN CHURCH, NEW HAVEN, CONNECTICUT, U.S.A.—MR. F. R. CONSTOCK, ARCHITECT.
INTERIOR.

PHOTO LITHO SPAULD & CO. LTD. 445 EAST MADISON STREET, CHICAGO, ILL. U.S.A.



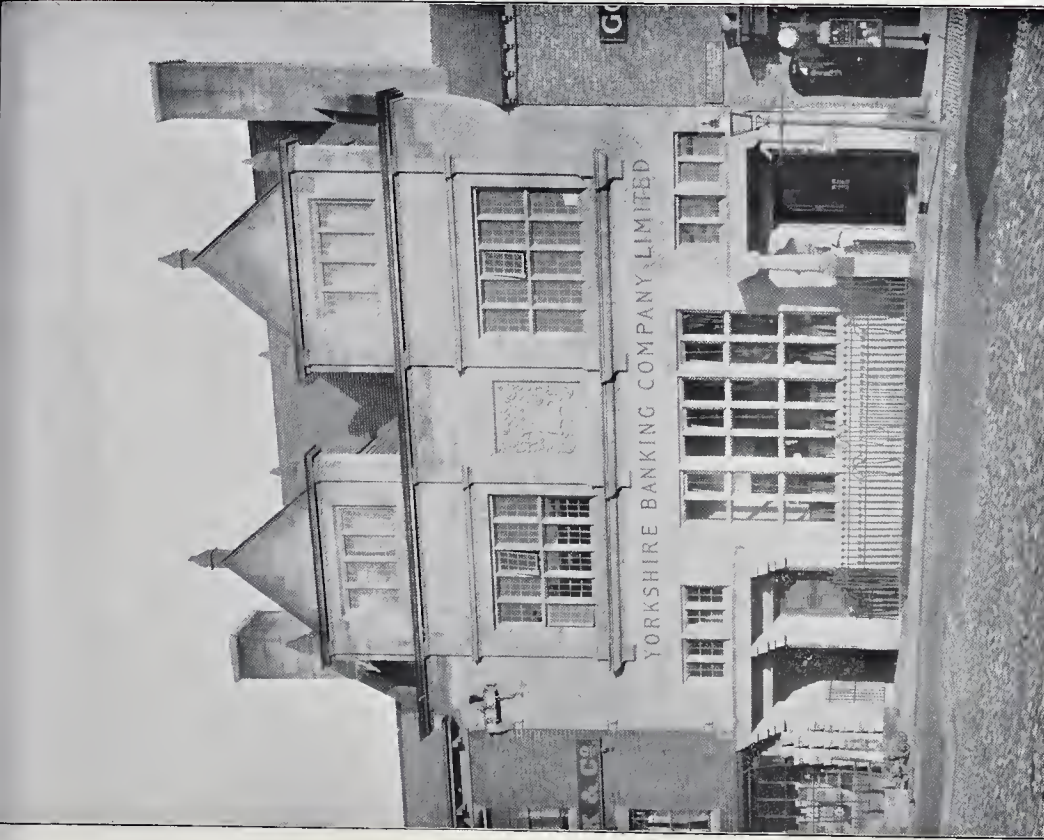


HITCHIN TOWN HALL.



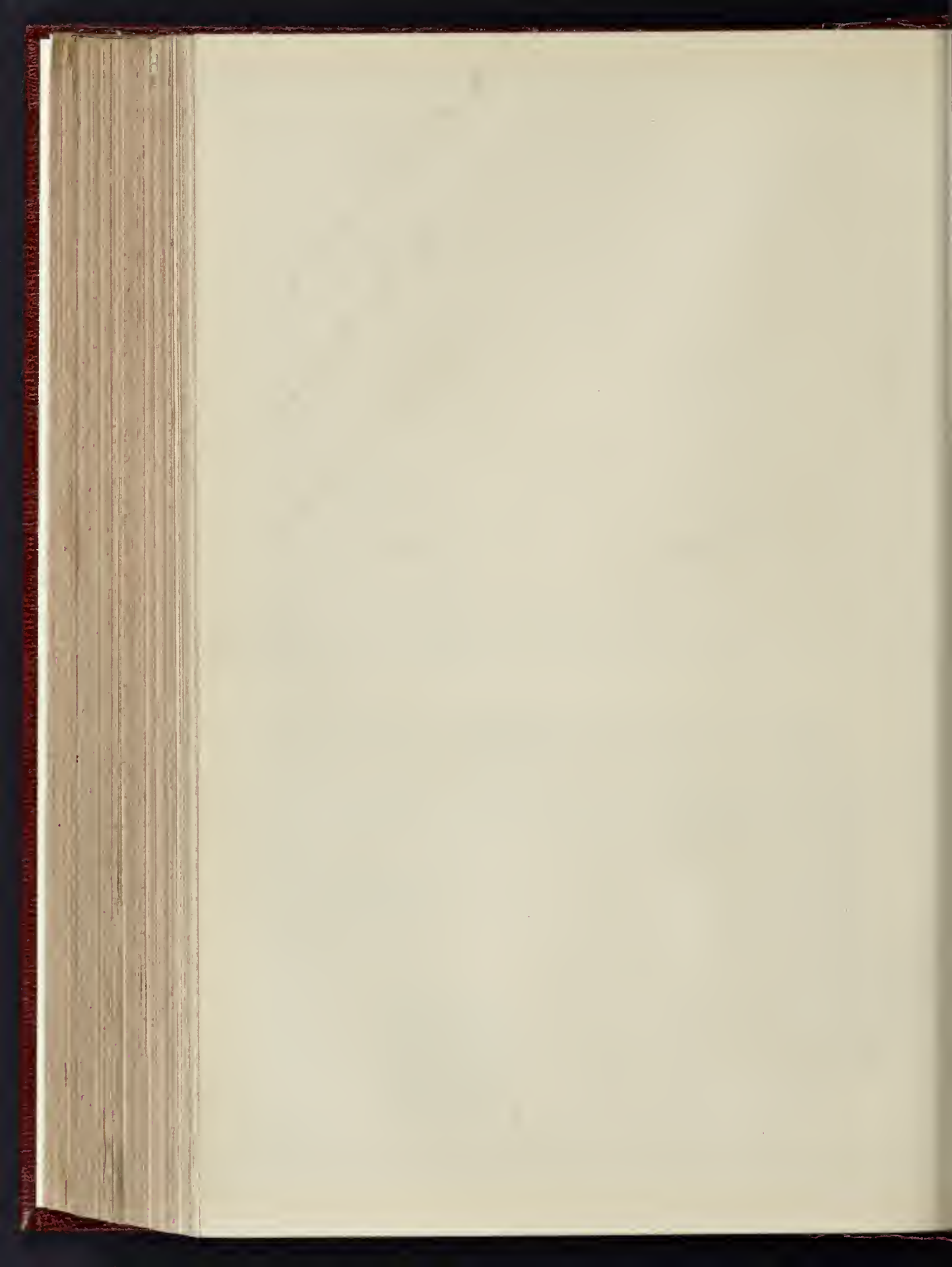


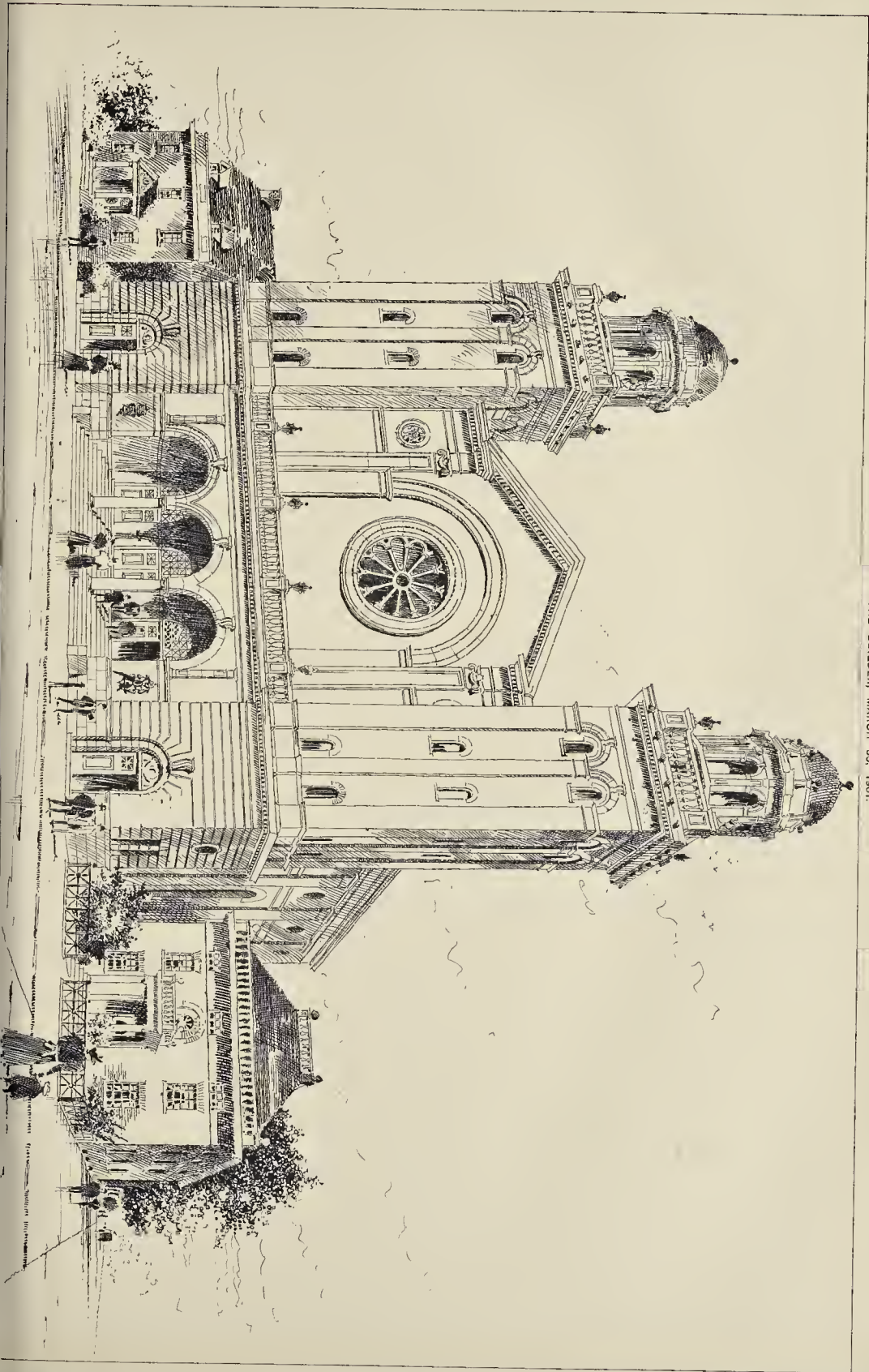
PREMISES AT HUNSLET, LEEDS.—MESSRS. BEDFORD & KITSON, ARCHITECTS.



PREMISES IN MARKET PLACE, THIRSK.—MESSRS. BEDFORD & KITSON, ARCHITECTS.

Young & Co., Ltd., 1 & 3 Kent Building, St. Peter, Leeds, E.C.





THE BUILDER, MARCH 30, 1901.

about a mile from the head office. The front is constructed of Ancaster stone and purpose made brick. The banking premises occupy the whole of the ground floor, and the rooms above form the caretaker's house.

The contractors were: Brick and stone, Messrs. Wm. Thompson & Sons; joiner, Mr. Banks Mawson; plumber, Mr. George Thompson; and plasterer, Messrs. Mountain & Sons.

Messrs. Bedford & Kitson, of Leeds, were the architects for both the buildings.

COMPETITIONS.

HOLBECK'S NEW LIBRARY, LEEDS.—The competitive plans for a new branch library in Holbeck were recently exhibited at the Leeds Art Gallery. Most of the eleven competing architects have introduced a tower or turret into the design. In the first premiated design (Mr. W. Bakewell's) provision is made on the lower ground floor for a boys' reading room, with attendants' and store rooms. Above there is a general reading room with an area of 2,036 square feet, and adjoining it a lending library (790 square feet), a ladies' room (310 square feet), book store, and librarian's room. The book accommodation is for 15,000 volumes, with the possibility of extending that limit by means of a gallery to 27,000 volumes. The second premiated design was by Messrs. Buttery & Bird.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The seventh ordinary meeting in connexion with the Leeds and Yorkshire Architectural Society was held in the Society's rooms, Park-street, Leeds, on the 18th inst. A lecture was to have been delivered by Mr. Francis Bond, but that gentleman being unable to be present, the business was purely formal, and comprised the election of the following officers for the coming session:—President, Mr. T. Butler Wilson; vice-presidents, Mr. C. B. Howdill and Mr. R. Wood; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. W. H. Beavers; hon. secretary, Mr. H. S. Chorley; Council, Messrs. F. W. Bedford, G. F. Bowman, A. E. Dixon, A. Hill, S. D. Kitson, and W. G. Smithson. Messrs. H. Ambler and H. E. Illingworth were elected hon. auditors. The prize drawings from the Royal Institute of British Architects were on view.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On Saturday morning last the members of this Association journeyed to Kirkcaldy, where they visited the Victoria Cabinet Works, permission for which had been granted by Messrs. A. H. McIntosh & Co. The party was under the leadership of Mr. George Ferguson, who explained the various processes and machinery. In the afternoon the Adam Smith and Beveridge Memorial Halls were visited by permission of Mr. W. L. Macindoe, Town Clerk, where Mr. James B. Dunn, the architect, acted as leader and described the different parts.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on the 20th inst.—Dr. W. de Gray Birch in the chair.—Mr. Patrick, Hon. Secretary, read some notes of a discovery made at Lancaster on the 13th inst., communicated by Mr. T. Cann Hughes. The discovery consists of two urns, probably Saxon. The larger of the two was in a fragmentary condition, but the smaller one is intact. They are both of imperfectly dried clay of a reddish colour, and bear handmarkings. No ashes or coins were found. The urn and the fragments have been deposited in the museum in the Storey Institute, together with a tracing showing the exact spot where they were found. The locality, at the junction of Alfred and De Vitre-streets, is quite a new one, not at all in the centre of the town, but not far from a former site of a monastic establishment. The find is not otherwise important. With reference to the recent quinquenary of the poet Chaucer, the Rev. W. S. Lach-Szyna read an interesting paper upon "Chaucer as illustrating English Mediæval Life." He said there were three great lights illustrating Mediæval English Life—Wycliffe, Chaucer, and Piers Ploughman. The former takes the clerical standpoint as a sort of English Savonarola, denouncing the

vice, dissipation, and coarseness of the upper classes in Church and State in the days of Richard II., and suggesting the reforms which, in his opinion, were necessary. Chaucer takes the more congenial lay view of a satirist and poet. Piers Ploughman raises a jeremiad against mediæval defects and shortcomings, but in characteristic allegorical mode so fashionable in his time. There are many points in which the personality of Chaucer resembles that of Dickens—both are humorists, both have a hearty hatred of humbug and hypocrisy, both stoop to depict the poor and the ignorant, and both have vast powers of description. Chaucer, however, rises to a higher stage of elegance of description, and his imagination is of a far more gorgeous kind than that of Dickens. In Chaucer, we have both the light and shadow of mediæval England; we see tournaments and pageants, fine knights and ladies, in baronial halls and the rough middle-class burgher; the artisan, in his rude humble home, and the peasant emerging from barbarism. The people of England have not really changed much since Chaucer's day; many of us must often have met amongst our private friends a majority of the personages in the "Canterbury Tales." The author considered that a historic lesson was to be learnt from that fact, that although costumes, habits, and fashions might differ, the "john Bull" of the end of the fourteenth century was very like his descendant of the end of the nineteenth. He wished that that lesson could be more enforced in history lessons at our schools, for children are often taught to look on the Englishman of mediæval times as a being quite strange and foreign to the people they meet with at home or in the streets.—An interesting discussion followed the paper, in which Major Frere, Mr. Kershaw, Mr. Compton, Mr. Patrick, and the Chairman took part.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The fourth lecture of the course of six on "Works Management" was given by Mr. A. H. Barker at the Westminster Palace Hotel on Tuesday, 19th inst., Mr. E. King, the Vice-Chairman of the Institution, presiding. Proceeding with the question of the relation of the manager to the various subordinate officials, the lecturer considered in detail the methods of transmitting orders to the works, describing the books necessary in connexion therewith. Systems for dealing with correspondence were treated, the filing of letters, drawings, specifications, &c., being described. Complete and accurate indexing was very essential to success. The duties of the store-keeper were entered into to show their bearing on the proper keeping of the costs accounts. The great desirability of a fair trial being given to new material, devices, &c., which might be brought under the notice of the manager was pointed out. Accurately conducted experiments were, however, imperative, the results to be recorded and tabulated for future reference. The various methods of remunerating workmen for work done were then fully considered, the difficulties of the piecework system being dwelt upon. The premium method needed the exercise of much organising talent on the part of the management, or it would lead to great confusion.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

—The tenth general meeting (business) of the session of this Institute will be held on Monday next, to consider amendments to the Institute form of conditions of contract. The Council, having finally withdrawn from further negotiation with the Institute of Builders, no longer bring forward the amended clauses with a view to securing a uniform form of contract agreed upon by both Institutes; but they submit them to the consideration of the general body; with a view to such amendments being incorporated in the Royal Institute Form of Contract as may be found desirable. As the Council do not propose these amended clauses, they have been printed *in extenso*, including the suggested arbitration clause, for the information of members. We printed the amended clauses in our issue for December 8 last.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by first post on Wednesday morning, except lists of tenders, which will be received up to 10 a.m. of the same day.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Hackney Borough Council 30,000*l.* for electric light installation; the Hammersmith Borough Council 13,530*l.* for electric light installation; the Lewisham Borough Council 1,000*l.* for asphalt paving works; the Stepney Borough Council 5,165*l.* for street lighting; the Lewisham Borough Council 6,000*l.* for library buildings; the Islington Guardians 4,700*l.* for works at the workhouse at St. John's road; and the Stepney Guardians 15,000*l.* for the erection of schools.

Office Accommodation.—On the recommendation of the Establishment Committee, it was agreed:—

"That the estimate submitted by the Finance Committee be approved; and that an expenditure of a sum not exceeding 8,000*l.* be authorised for carrying out the structural alterations for the purposes of connecting the premises Nos. 25, 26, and 27, Cooper-street, with the main building, and of providing additional office accommodation. That Standing Order No. 184, relating to jobbing works, be suspended in order to enable the following recommendation to be considered: That the work be carried out by the Works Department at prime cost, plus 15 per cent. for plant, establishment, and general charges."

Housing.—The Housing of the Working Classes Committee brought up the following paragraph:—

"On February 12, 1901, the Council authorised us to advertise for tenders to be delivered to the Council on 26th inst. for the erection of the dwellings on the Duke's-court site, Drury-lane, for the accommodation of 610 persons of the working classes to be displaced by the carrying out of the Clare Market, Strand, scheme. We now submit the working drawings, bills of quantities, specification, and architect's estimate amounting to 26,285*l.* in respect of the three blocks of dwellings, which will be known as Sheridan, Beaumont, and Fletcher buildings. The architect's estimate is made up as follows:—

Buildings.....	£24,965
Architect's expenses, including articles supplied by the Council and provision for contingencies.....	1,000
Quantity surveyor's fees.....	290
Trial holes (already voted).....	30
	26,285

The dwellings will consist of three blocks of five-story dwellings, which will provide accommodation for 610 persons in 130 tenements, of these ten will be of one room, seventy-five of two rooms, thirty-five of three rooms, and ten of four rooms. One hundred and twenty tenements will be entirely self-contained, and the remaining ten will have private water-closets, but sculleries common to two tenements. We have had before us estimates of the probable receipts and outgoings in respect of the dwellings, and we are satisfied that the erection of the buildings will not involve any charge on the county rate. We propose to hold a meeting to consider the tenders which will be referred to us by the Council for consideration on the 26th inst. This will enable us to submit a tender for acceptance at the same time that the Finance Committee report on the estimate of the cost of the erection of the buildings. We recommend that the working drawings, specification, bills of quantities in respect of Sheridan, Beaumont, and Fletcher-buildings, and the estimate of 26,285*l.* submitted by the Finance Committee in connexion therewith be approved."

Mr. A. L. Cohen pointed out that the charge made by the Guinness Trust was 2s. 1½ per room, while the Four Per Cent. Industrial Dwellings Company charged iron 2s. 6½d. to 3s. 0½d., but in the latter case a bathroom was provided. He contended that, until the Council gave their architect instructions to prepare plans for houses which would allow of a rent of 2s. a room being charged, the difficulty would never be solved. He moved that the Report be referred back, so that fresh plans might be prepared which would allow of the classes being housed whom it was their duty to house.

Mr. Campbell seconded the amendment. Dr. Collins said the rents to be charged by the Council were from 3s. to 4s. for one room, 6s. to 6s. 6d. for two rooms, 8s. to 8s. 6d. for three rooms, and 10s. to 10s. 6d. for four rooms.

Mr. Bruce said that the two sites cost 80,000*l.*, and had to be written down by the Finance Committee for housing purposes to 9,600*l.*

Mr. Beachcroft said the question was not what they charged per room, but the fact that

the Council very rightly and properly prevented overcrowding in the dwellings, and compelled people who would otherwise take two rooms to take three rooms instead. It seemed to be foolish to write down the value of the site and then to make it appear that no charge would fall on the rates, by charging 3s. a room to people who could only afford to pay 2s.

Mr. Hunter declared that when the Government put the Council upon the same footing as the companies they could build quite as cheaply. They had asked an outside architect to design buildings for them, but while he provided for 500 persons the Home Secretary would only allow for 300. Yet the architect told the Council that those plans were superior to any of those prepared for the private companies.

Dr. Collins said the Committee had instructed their architect to prepare plans of the simplest design, and it was the way in which the plans had been received by the Home Office which had caused the increased cost.

The amendment was defeated, and the report afterwards adopted.

It was reported that Ruskin Buildings, Millbank estate, are now practically completed. Ruskin Buildings is the more northerly of the two blocks of buildings which face the central open space and which are similar buildings with plan reversed. The block is divided into four houses containing eighty-five tenements and 215 rooms, giving accommodation for 430 persons.

The Committee brought up a report containing the following recommendation:—"That the tender of Messrs. Martin, Wells, & Co., amounting to 23,600*l.*, for the erection of Sheridan, Beaumont, and Fletcher Buildings, be accepted."

[This was agreed to. The tender is 1,365*l.* below the architect's estimate.]

The same Committee reported as follows:—

In pursuance of the resolution of the Council of October 23, 1900, as to applications involving displacements of the working classes, we reported on January 29, 1901, that our attention had been drawn by the Building Act Committee to an application made under the Act by Messrs. W. Bradford & Sons on behalf of Messrs. Mann, Crossman, & Paulin, for sanction to a scheme for the widening of Brady-street, Bolt-street, Foster-street, and Thomas-passage, Whitechapel-road, in connexion with the extension of their brewery. Application has now been made for sanction to an amendment of the scheme, by which eight more houses, occupied by persons of the working classes, will be cleared away; and upon the basis of two persons per room, thirty-eight more persons will be displaced, and it does not appear that any provision is made for rehousing them. In accordance with the resolution of the Council of January 29, 1901, efforts have been made, but without success, to induce Messrs. Mann, Crossman, & Paulin to make some provision for rehousing the persons displaced. Our attention has also been drawn by the Building Act Committee to an application from Mr. Max Clarke on behalf of Spratt's Patent, Limited, for consent to the erection of a warehouse on the west side of Fave-street, Bromley-by-Bow, Poplar. In this case eight houses, recently occupied by persons of the working class, are being demolished. Upon the basis of two persons per room, sixty-four persons will be displaced, and no provision appears to be made for the rehousing of any of them.

The following table shows the displacements, of which we have received particulars, to date:—

Date when report made to the Council.	Houses removed.	Houses to be erected.	Number of persons displaced.	Number of persons proposed to be rehoused.	Number of persons unprovided for.
Nov. 13, 1900 ..	216	141	1,728	1,692	36
Jan. 22, 1901	29	—	312	—	312
Jan. 29, 1901	16	—	936	—	936
March 26, 1901	8	—	64	—	64
				Total...	1,436

The Building Act.—A discussion took place on the recommendation of the Building Act Committee to consent to plans of an extension of Messrs. Spratt's premises at Poplar [see above paragraph].

Mr. Yates moved that consent be not given unless a guarantee was given that the sixty-four persons disoused would be rehoused.

Mr. Strauss seconded the amendment.

Mr. Goddard Clark (Chairman of the Building Act Committee) said in deference to the Council he would take the matter back, but he did not think anything could be done, because

the applicants might go to a higher tribunal, and the Council might get a slap in the face.

Sir Arthur Arnold remarked that it was a most foolish policy to try and go behind the law in that way. It might be that they disagreed with the law, but their proper course should be to try to get it altered.

A similar amendment with regard to another recommendation of the Building Act Committee respecting the extension of the premises of Messrs. Mann, Crossman, & Paulin was defeated.

Widening of Narrow-street, Limehouse.—On the recommendation of the Improvements Committee, it was agreed that the estimate of 9,326*l.*, submitted by the Finance Committee, be approved, and that a contribution be made by the Council on the usual conditions of one-half of the net cost of the widening of Narrow-street, Limehouse, between the Barley Mow public-house and Three Colt-street, and of Three Colt-street at No. 107, proposed to be undertaken by the Council of the Metropolitan Borough of Stepney.

Sewer Works.—On the recommendation of the Main Drainage Committee, it was agreed that the estimate submitted by the Finance Committee be approved; that the tender of Mr. Cliff Ford, amounting to 12,911*l.* 5*s.* 8*d.*, for the extension of the middle-level sewer to Mitre-bridge and the construction of a new sewer in Scrubs-lane, as well as a length of sewer in connexion with the overflow from the Counter's Creek sewer, be accepted.

Boys' Home, Lowestoft.—On the recommendation of the Industrial and Reformatory Schools Committee, it was agreed that the supplemental estimate submitted by the Finance Committee be approved, and that the additional expenditure of 1,000*l.* in respect of the erection of the Shipping Agency building at Lowestoft, and quantity surveyor's fees, clerk of works' wages, &c., be sanctioned. That, subject to the result of the usual inquiries being satisfactory, the tender of Mr. J. Ashby, Mill-road, Lowestoft, of 3,958*l.* 10*s.* 8*d.* for the erection of the building, be accepted.

New Entrance Gates, Battersea Park.—The Parks and Open Spaces Committee recommended, and it was agreed, that the estimate of 1,990*l.* submitted by the Finance Committee be approved, and that an expenditure of that amount be sanctioned for the construction of four sets of wrought-iron entrance gates, with stone piers, at Battersea Park, the work to be carried out by the Works Department without the intervention of a contractor.

Appointment of an Architect as Arbitrator.—The Theatres and Music Halls Committee reported as follows, the recommendation being agreed to:—

"On February 12 last we reported to the Council the fact that a notice of appeal had been received from Messrs. Fladgates & Co., on behalf of the owners, against the sealed notice from the Council requiring certain structural alterations to be made to the Vaudeville Theatre, Strand. The Council then instructed the Clerk to apply to his Majesty's First Commissioner of Works for the appointment of an arbitrator to hear and determine the appeal. A letter has now been received from his Majesty's Office of Works stating that Mr. W. Emerson, P.R.I.B.A., has been appointed to hear and determine the appeal. We recommend that the solicitor be authorised to take all necessary steps to support the Council's requirements before the arbitrator."

Theatres, &c.—On the recommendations of the same Committee, sanction was given to the following applications:—

Arrangements at the London Music Hall (Mr. F. Matcham).

The means of communication between the Lyric Theatre, Shaftesbury-avenue, and the proposed new offices (Mr. J. G. Buckle).

The reconstruction of the dressing-room block at the Oxford Music Hall, Oxford-street (Messrs. Wylson & Long).

Proposed new doorway at the St. James's Theatre, King-street, St. James's (Mr. A. B. Jackson).

Gates proposed to be erected at the St. Olave and St. John Institute, Tooley-street (Mr. H. Stock).

Tramways and Tubs.—Dr. Cooper moved:—

"That it be an instruction to the Highways Committee to consider (a) the routes along which extensions of the London tramways system ought to take, having regard to the needs of the inhabitants in every part of the county; (b) the establishment of a tramway centre or centres to which extensions shall converge; (c) the railway extensions required to perfect the London overhead railway

system; (d) the extensions required to perfect the London tube or underground railway system; and to report to the Council their conclusions at the earliest possible date."

Mr. Sidney Low seconded the motion, and with the consent of the mover, added the following words:—

"And that it be a further instruction to the Highways Committee to secure that the views of the London County Council on the question of tube or underground railway schemes now before Parliament shall be properly represented before the Joint Committee of both Houses formed to consider the subject."

The motion, as amended, was agreed to. The Council shortly afterwards adjourned.

METROPOLITAN ASYLUMS BOARD.

The fortnightly meeting of this Board was held on Saturday, Sir E. Galsworthy presiding.

A letter was read from the Local Government Board stating that, with considerable hesitation, they were issuing an order authorising the expenditure of a sum not exceeding 125,691*l.* on the erection of the proposed White Oak School, and sanctioning 118,691*l.* of this amount to be defrayed by a loan repayable in thirty years and the remaining 7,000*l.* by a loan repayable in fifteen years.

The Works Committee submitted a statement showing that up to the present 52,701*l.* 14*s.* 3*d.* had been spent in erecting the new health offices on the Victoria Embankment. The original estimate was 49,543*l.* The amount already spent on the superstructure was 44,900*l.*, exclusive of the ventilating tower. It was now necessary to obtain sanction to raise the extra expenditure beyond the 43,400*l.* already authorised, and a recommendation that application be made to the Local Government Board to raise a further loan of 11,000*l.* was approved.

With regard to the proposed additions alterations to the laundry at Leaveland Asylum, the Works Committee reported that Messrs. Newnam & Newnam, the architect, had been directed to prepare an amended plan with a view to the better separation of the sexes and more efficient administration under supervision of the laundry generally.

The Works Committee also submitted a report respecting the proposed South-east Hospital. In November last a revised estimate whereby the cost was reduced from 319,400*l.* to 284,300*l.*, and the cost per head from 39*s.* to 35*s.* 2*d.*, was submitted to the Local Government Board. Beyond a bare acknowledgment of the letter, the Managers had heard nothing from the Board, and Messrs. Treadwell & Martin, the architects, had written complaining of the delay, and pointing out that, unless instructions were received by them forthwith, there would be very little chance of the work being commenced at all during the present year. The Managers adopted the suggestion of the Committee that the Local Government Board should be pressed to give their final decision at an early date.

On the recommendation of the Works Committee the tender of Messrs. McCormick & Sons, in 84,577*l.* for the erection of High Wood School, Brentwood, was accepted.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage and Projections.

Woolwich.—Re-building of the houses, with shop on the ground floor, on the north side of Wellington-street, Woolwich, between Mulgrave-place and Brewer-street (Mr. H. P. Monckton for Capt. R. A. Ogilby).—Consent.

Bow and Bromley.—A block of stable buildings the west side of Leven-road, Bromley (Mr. R. Kingham for the London General Omnibus Company, Limited).—Consent.

Greenwich.—A hotel, with stables, on the south-east side of Beaconsfield-road, Westcombe Park, Greenwich, at the corner of Mycene-road (Mr. M. L. Saunders for Mr. F. Pell).—Consent.

Hackney South.—One-story shops on part of the forecourts of Nos. 206 to 226 (even numbers on

Inclusive, Morning-lane, Hackney (Mr. W. Hall for Mr. T. W. Webber).—Consent.

Hammersmith.—Extension of the period within which the erection of buildings with oriel windows upon a site on the west-side of Queen-street and the south side of Sussex-place, Hammersmith, was required to be commenced, be granted (Mr. H. G. Brace for Mr. W. Moss).—Consent.

Hampstead.—Dwelling-house on the north side of Ashcroft-road, Hampstead, to abut upon Fregal (Mr. A. C. H. Watkin for Mr. W. Davis).—Consent.

Hampstead.—Residential flats on the west side of West End-lane, Hampstead, between Douglas Mansions and Carlton Mansions (Messrs. Palgrave & Co. for Messrs. Herbert Reeves & Co.).—Consent.

Islington, East.—Retention of a one-story stable building at the rear of No. 95, Hornsey-road, Islington, abutting on Shelburne-road (Mr. C. G. Champion for Messrs. Watson & Clarke).—Consent.

Kensington, South.—An addition to No. 28, Argyle-road, Kensington, to abut upon Essex-villas (Messrs. Hussey & Walcott for Mr. J. E. Wald).—Consent.

Lewisham.—Two houses on the west side of Newlands Park, Sydenham (Mr. E. Bates for Welford's Surrey Dairies, Limited).—Consent.

Marylebone, East.—Movable wood and glass screens at the sides of a stone portico at the entrance to No. 5, Cavendish-square, St. Marylebone (Messrs. Smees & Cobay for Mr. F. C. Hunter).—Consent.

St. George, Hanover-square.—Wood and glass inclosures to an open portico at the entrance to No. 46, Grosvenor-street, St. George, Hanover-square (Messrs. A. Blomfield & Sons for Mr. E. Speyer).—Consent.

St. George, Hanover-square.—An open portico in front of a building, Nos. 19 and 19A, Hanover-square, St. George, Hanover-square (Mr. J. Hudson for Messrs. Ashdown, Limited).—Consent.

Wandsworth.—Retention of a gas-meter house in the playground of the Sunny Hill-road school, Sreamtham, abutting on Valley-road (Mr. T. J. Bailey for the School Board for London).—Consent.

Wandsworth.—An extension of the period within which the erection of one-story shops upon part of the forecourts of Nos. 151 to 160 (odd numbers only, inclusive), Balham High-road, Wandsworth, was required to be completed, be granted (Messrs. Gibbon & Moore).—Consent.

Kensington, South.—Three-story bay window in front of No. 4, Douro-place, Kensington (Mr. A. Addeley).—Consent.

Deptford.—Two lamps to overhang the public way at the White Hart public-house, Grove-street, Deptford, at the corner of New-road (Messrs. Humphreys-Davies & Co. for Messrs. Style & Winch, Limited).—Refused.

City of London.—An iron and glass shelter at the entrance to De Keyser's Royal Hotel, Victoria Embankment City (Mr. H. C. Morris for De Keyser's Royal Hotel, Limited).—Refused.

Chelsea.—An iron sign at the first floor level in front of No. 13, King's-road, Chelsea, to project over the public way (Mr. H. D. Bryan for Messrs. Scott, Cuthbertson, & Co. and Messrs. Cotterell Brothers).—Refused.

Dulwich.—The erection, on three sites on the south side of East Dulwich-road, Camberwell, one of the sites abutting also upon Oakhurst-grove, of buildings (Mr. W. E. Deane for Mr. A. J. Walke).—Refused.

Hampstead.—A greenhouse at the nursery on the eastern side of Haverstock-hill, Hampstead (Mr. J. D. Hunter for Mr. J. Russell).—Refused.

Kensington, North.—One-story shops and an entrance-way on the forecourt of Norland Castle, Queen's-road, Notting Hill, at the corner of Norland-road North (Mr. A. Gordon for the Salvation Army).—Refused.

Width of Way.

Bow and Bromley.—A building, to be used as a slate factory, on the north-east side of Bow Common-lane, Bromley, nearly opposite Thomas-street, with the forecourt boundary fence at less than the prescribed distance from the centre of Bow Common-lane and without the site of the slate factory being covered with a layer of good concrete at least 6 in. thick (Mr. R. H. Kerr for Mr. J. Burroughes).—Consent.

Camberwell, North.—Two dormitories and a boiler-house of a temporary character at the rear of the guardians' offices, Peckham-road, Camberwell, with the boundary fence at less than the prescribed distance from the centre of Havil-street (Mr. E. T. Hall for the Guardians of the parish of St. Giles, Camberwell).—Consent.

Clapham.—A one-story building, to be used as a children's reading-room, at the rear of the public library, Lavender-hill, Battersea, at less than the prescribed distance from the centre of Green-lane (Mr. W. M. Wilkins for the Council of the Metropolitan Borough of Battersea).—Consent.

Hackney, South.—A one-story addition to a building at the rear of No. 10, Tower-street, London-fields, Hackney, at less than the prescribed distance from the centre of Martello-terrace (Mr. A. Rider for the Tower Fur Company).—Consent.

Hoxton.—Retention of a warehouse building on the north side of Bowling-green-walk, Pitfield-street, Hoxton, at less than the prescribed distance from the centre of the street (Mr. H. W. Dobb for Mr. W. B. Benjafield).—Consent.

Poplar.—Buildings, to be used as offices and warehouses, at Glasshouse-wharf, Orchard-place, Blackwall, at less than the prescribed distance from the centre of the street (Messrs. J. and S. T. Clarkson for Messrs. Fowler, Limited).—Consent.

Wandsworth.—A two-story warehouse at Baltic-wharf, Brewhouse-lane, Putney, at less than the prescribed distance from the centre of the street (Messrs. W. Douglas & Sons).—Refused.

Space at Rear.

Holborn.—A block of residential flats on the site of Nos. 94 to 97 (inclusive), Great Russell-street, and No. 21, Bloomsbury-street, Holborn, with an irregular open space at the rear and with portions of the building to extend above the diagonal line directed by Section 41 of the Act to be drawn (Mr. A. Burr for Mr. H. J. Pearce).—Refused.

St. George-in-the-East.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of two-story additions at the rear of Nos. 42 to 54 (even numbers only inclusive), and Nos. 49 and 51, Burross-street, St. George-in-the-East, by reason of which the buildings will have irregular open spaces at the rear (Mr. E. Crosse for Mr. J. Rubenstein).—Refused.

Wandsworth.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story stable and a cart-shed on a piece of land on the south side of Atheldene-road, Wandsworth, at the rear of houses on the east side of Garrett-lane, without an open space at the rear (Mr. J. Bird).—Refused.

Line of Frontage and Space at Rear.

St. Pancras, East.—That the application of Mr. O. Fleming for the Fire Brigade Committee of the Council, for an extension of the periods within which the erection, on the site of No. 69, Euston-square and Nos. 172 and 174, Euston-road, St. Pancras, of a fire brigade station, with a projecting five-story bay-window and a bose hoist, and with an irregular space at the rear, was required to be commenced and completed, be granted.—Agreed.

Line of Frontage and Width of Way.

Norwood.—Three blocks of residential flats on a site on the south side of Thurloe Park-road, Tulse-hill, at the corner of Avenue Park-road (Mr. J. W. Abraham for Mr. Perrin).—Refused.

Lines of Frontage and Construction.

Poplar.—An overhead transporter, to be constructed of steel and wood, across East Ferry-road, Poplar, near its junction with Glengall-road, with an iron roof over the portion of the transporter spanning East Ferry-road (Millwall Dock Company).—Consent.

Hackney, North.—Two open play-sheds at the proposed schools, Northwood-road, Hackney, with one of such sheds in advance of the general line of buildings in Northwood-road (Mr. T. J. Bailey for the School Board for London).—Refused.

Width of Way and Construction of Buildings.

St. George-in-the-East.—A play-shed in the play-ground of the Berner-street School, St. George-in-the-East, at less than the prescribed distance from the respective centres of Batty-street and Fairclough-street (Mr. T. J. Bailey for the School Board for London).—Consent.

Limchouse.—Retention of an open wood and iron shed erected on the south side of St. Paul's-road Limehouse, near the railway viaduct crossing that road, and the erection of an addition to such shed (Mr. A. H. Barker).—Refused.

Width of Way, Line of Frontage, and Space at Rear.

Woolwich.—The re-building of Nos. 2, 3, and 4, Frances-street, Hill-street, Woolwich (Mr. H. E. Monckton for Captain R. A. Ogilby, Mr. J. D. Buckley and Mr. T. Gwillim).—Consent.

Formation of Streets.

Whitechapel and Bethnal Green, South-West.—That an order be issued to Messrs. W. Bradford and Sons sanctioning the widening of Brady-street, Bath-street and Foster-street, Bethnal Green, and the widening and adaptation for carriage traffic of Thomas-passage (for Messrs. Mann, Crossman and Paulin).—Agreed.

Lewisham.—That an order be issued to Mr. J. W. Webb refusing to sanction the formation or laying out of new streets for carriage traffic on part of the Crofton Park estate, Crofton Park-road, Brockley.—Agreed.

Wandsworth.—That an order be issued to Messrs. Marler & Co. refusing to sanction the formation or laying out of a street for carriage traffic out of the north-west side of Mitcham-lane, Sreamtham (for Colonel R. J. Aspinall).—Agreed.

Separation of Buildings.

City of London.—The formation of two openings at the first floor level in the party-wall between Nos. 97 and 99, Gresham-street, City (Mr. C. E. Sayer for Messrs. Coates, Son & Co.).—Refused.

The recommendations marked † are contrary to the view of the Local Authorities.

BOOKS RECEIVED.

BUILDING SPECIFICATIONS. By John Leaning, F.S.I. (B. T. Batsford).
THE PRINCIPLES OF PLANNING. By Percy L. Marks. (B. T. Batsford).

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

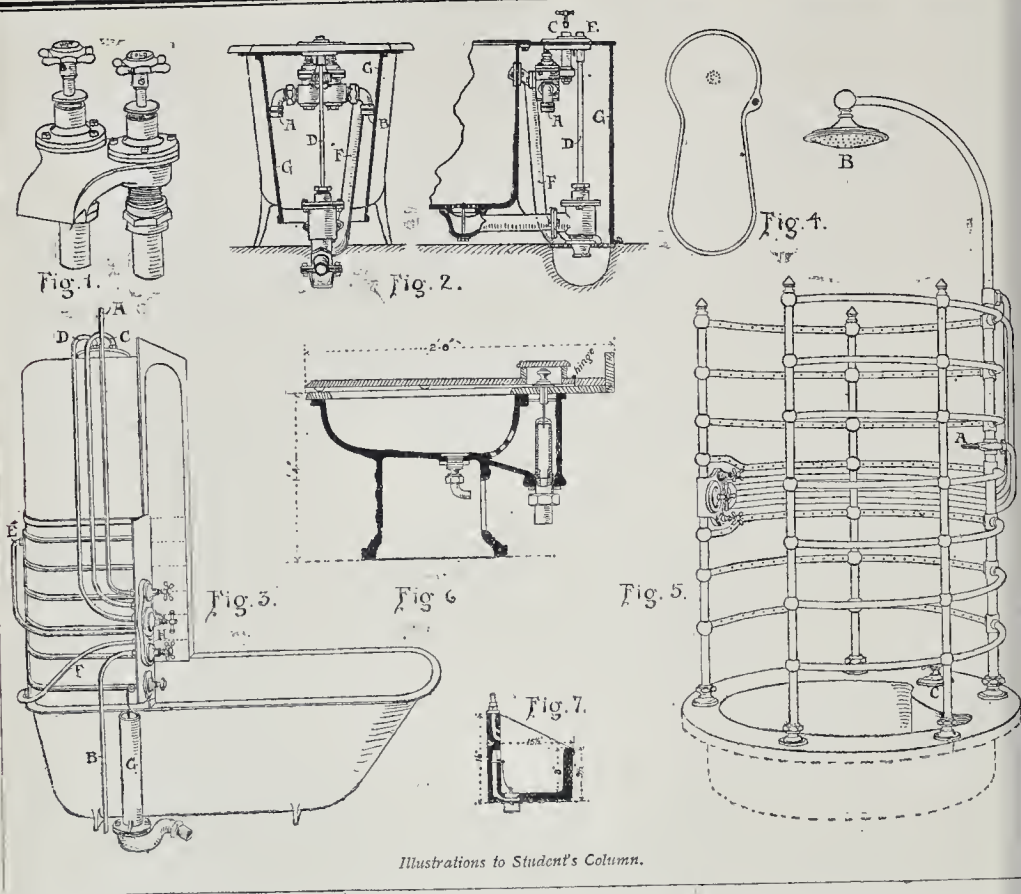
12.—BATHS (continued).

INLETS.—At one time it was a common practice to admit the water to a bath through the waste-outlet. This was effected by connecting the hot and cold supply-pipes to the waste-pipe between the waste-outlet and the waste-valve. This arrangement is now generally condemned for two good reasons. In the first place, the waste-pipe is often seriously fouled with the last soapy drainings from the bath, and when the water is again turned on it carries back into the bath some of this objectionable matter. The second reason is that, if the waste-valve is left open (as it usually is), one or both of the taps may be left running and the water will escape unnoticed through the waste-pipe. It is for the latter reason that water companies object to the arrangement.

The most obvious method of admitting water is by means of two taps, one for hot water and the other for cold. These ought to be at or near the foot of the bath, so as to be out of the bather's way, and ought not to project far over the edge of the bath. Hot water admitted in this way gives off a good deal of steam, and to reduce this to some extent the taps are sometimes connected with a mixing-box (fig. 1), from which a single stream of tepid water issues into the bath. The same end is gained by admitting the water into the bath at a low level, as shown in fig. 3 (p. 269). Fig. 6 on the same page shows a single-stream inlet connected at about half the depth of a porcelain bath. The objection to low-level inlets is that they may be fouled by dirty bath-water, and the regulations of many sanitary authorities now require that the inlets must be placed so that the orifices are above the highest water-level of the bath—that is to say, above the overflow grating or above the top of the standing overflow.

For asylums, hospitals, prisons, and some other institutions, it is not desirable that the fittings should be under the control of the bathers, and in such cases the taps and waste may be so designed that they can only be actuated by a special key, which is in the possession of the attendant. Such an arrangement is shown in fig. 2, where A is the cold-water supply, B the hot-water supply, C the keyhole and key by which the water is turned on, D the waste spindle, with keyhole at E, F the overflow, and G the cast-iron casing in which the fittings are enclosed. The hot and cold supplies are in this case controlled by a single key, the cold water being started by the first movement of the key, and the hot water being turned on by a further movement. This prevents the scalding of the bather, but if the "hot" water is for any reason at an abnormally low temperature it may prevent a sufficiently warm bath being obtained. In one illustration the waste discharges into a floor-channel, a method often adopted where two or more fittings (baths and lavatories) are fixed in close proximity; a trap can, however, be connected with the waste-pipe if desired. Another method of withdrawing the fittings from the control of the bather is to carry the spindles or levers through the wall or partition at the foot of the bath so that they can be actuated by the attendant in the passage outside.

Special Baths.—The ordinary plunge bath is often fitted with a hood containing pipes and other fittings by which the water can be admitted in a shower, spray, wave, and other ways. The "shower" is admitted through a rose placed over the head of the bather at the outlet end of the bath. The "douche" is a stream of water admitted through a nozzle in the centre of the shower rose. The "wave" is a stream of water admitted through a wide but shallow orifice at the back of the hood so as to play upon the hips of the bather. The "spray" consists of a number of very fine jets of water admitted through perforations in tiers of horizontal pipes or in a series of vertical pipes placed at intervals around the hood. Sometimes a "sitz" or ascending spray fitting



Illustrations to Student's Column.

is placed in the bottom of a plunge bath, but as this inlet is below the water-level of the bath it cannot be recommended, for the reasons already given. A sitz bath ought to be a separate fitting.

The spray, douche, and shower are the special forms of inlet most commonly adopted, and a bath fitted with these is shown in fig. 3, A being the hot-water supply-pipe, B the cold-water supply, C the shower supply, D the douche supply, E the spray supply (connected with six horizontal spray-pipes), F the plunge supply, G the overflow and waste, and H the hot and cold mixing-box, with taps and dial-plate. This bath is intended to be cased with wood, but independent baths containing these fittings are also made, and are certainly preferable on sanitary grounds. A door is arranged in the outer metal casing for access to the pipes immediately behind the mixing-box. In cheaper baths a single spray-pipe is fitted around the top of the hood. The plunge bath may be of cast iron, enamelled fireclay, or other material; the hood is generally of plate zinc or copper, finished to match the bath.

The bath shown in the illustration has parallel sides, and the hood is on the same lines. This shape does not entirely prevent splashing over the edges of the plunge outside the hood, and the keyhole-shaped bath (fig. 4) is a decided improvement in this respect.

Sometimes the metal hood is omitted, and the skeleton of pipes left exposed. A water-proof curtain can be suspended on rings around the pipes to prevent splashing. The pipes are generally of copper, polished, tinned, or nickel-plated.

For industrial schools, and other institutions where a large number of persons must bathe in a short time, and where water must be economised, the plunge-bath is often superseded by a skeleton of spray pipes with shower above. The water for a range of baths of this kind may be controlled by the attendant at a single mixing box, to which a thermometer may be attached so that the temperature can

be properly regulated. The floor may be dished or widely channelled, or may have an enamelled fireclay bath-tub sunk in it, as shown in fig. 5. This bath is somewhat elaborate, and has seven heights of 3/4-in. copper spray pipes, 1 1/4-in. vertical supply pipe at the back, four 1 1/4-in. vertical supporting tubes, wave fitting at A, shower at B, and waste-valve at C; the valves are under the control of the bather.

The control of the water supply to combined baths of the kind illustrated in fig. 2 was originally effected by two taps (hot and cold) for each kind of inlet, that is to say, two for the plunge, two for the shower, and so on. The next step in advance was made by having a mixing-box to which the hot and cold supplies were connected, and from which pipes, controlled by valves or taps, led to the different fittings. In a bath containing plunge, spray, shower, and douche, eight taps would be required under the former arrangement, and six under the latter. The most modern arrangement requires only three taps for any number of fittings. By turning the hot and cold taps, the water is run into a small mixing chamber, to which the pipes supplying the different parts of the bath are attached. On the face of the mixing-chamber a dial is formed, containing a central spindle and knob to which an indicator or pointer is fixed. The dial is marked with the words "plunge," "shower," "douche," &c., and the supply of water is admitted to either of these fittings by simply turning the pointer to the word on the dial. Only one inlet can be in operation at one time.

Sitz baths are shaped somewhat like arm-chairs, the essential feature being a rose in the sunk bottom, through which a spray of hot and cold water can ascend. A rose is often placed also in the back of the bath to give a horizontal spray, and above this a slit is sometimes provided for a "wave" inlet. The bath must be fitted with waste and overflow gratings. The

supply for the ascending spray ought not on any account to pass through the waste-pipe of its way to the bath. Sitz baths are made of enamelled fireclay, cast-iron, plate zinc, copper, and may be independent or enclosed in wood. The fittings are in all essentials similar to those of good plunge and spray baths.

Bidets are small baths on which a person can sit. The principal feature is an ascending spray near the centre of the basin. Fig. 4 shows a pedestal bidet in white ware or vitreous porcelain, fitted with outlet grating and staling waste and overflow similar in design to those used in many lavatory basins. The porcelain pedestal is better than a wood enclosure.

Foot-baths are useful in schools and other places, the best material being glazed fireclay. Enamelled iron is also used. Fig. 7 is a section of a fireclay foot-bath, with supply nozzle, overflow, and waste-plug. The overflow is accessible for cleansing, and this is certainly a disadvantage. The length of the bath is 19 in. the other dimensions are figured on the drawing. This bath is intended to be laid on the floor. In the case of a range of baths, the wastes may discharge into a single pipe trapped beyond the furthest fitting, and carried through a wall at the other end for ventilation. Access to the pipe will be facilitated if it is placed below the ceiling of the room under the floor. Sometimes the baths are raised on feet so that the total height is about 16 in. or 17 in. a floor-channel can then be arranged to receive the waste water.

Other special baths are used in hydropathic establishments, but these need not be discussed.

Bath-heaters.—In houses where there is hot-water supply or where this supply is sufficient, some method of heating bath water is necessary. Usually an appliance known as a "geyser" is adopted for the purpose, being the heating agent. The shell is generally of copper and the internal parts of copper or zinc. Much has been written about the dangers of geysers of this kind, and n

leaths have undoubtedly been caused by the products of combustion, when these have not been carried away by a ventilating flue. The products of combustion include carbon dioxide, sulphur compounds, &c., but the most dangerous is undoubtedly carbon monoxide. While, however, many deaths have been caused by unventilated geysers, it is perfectly true that many geysers have been fixed without ventilators, and have not proved in any appreciable degree injurious. The writer has practically tested this by standing in an unventilated bathroom (with the door and window closed) on several occasions during the whole of the time a bath was being filled, and the geyser in full operation; not the slightest discomfort was felt. Other persons have had the same experience, and this is undoubtedly one reason why plumbers and others continue to fix geysers without ventilation flues.

But it must not be forgotten that there are geysers and geysers, and that their effects differ very widely according to the difference in construction. They may be classed in two divisions—(1) those in which the products of combustion come in contact with the water, and (2) those in which the water and products of combustion are kept entirely separate. Geysers of the former class are the cheaper of the two, and are also the safer, as the water condenses a large portion of the products of combustion. It is with geysers of this class that the writer has experimented; he would not care to carry out similar tests with geysers of the other type. Then, again, some geysers have ordinary open-flame burners, while others have bunsen burners; and, finally, the gas supplied by different companies varies very much in the amount of contained impurities. It is, therefore, bad logic to argue that, because one geyser has been safely used without a ventilation flue, geysers of all kinds and in all places may be left unventilated.

The great disadvantage of geysers in which the products of combustion come in contact with the water is that the water is fouled. If the burners are of the open-flame type and not carefully regulated to prevent smoke, the fouling may be so serious as to render the water unsuitable for bathing, and in any case it is unsuitable for drinking. Even at the best, when it appears almost perfectly clean, it often feels slightly greasy to the touch, and contains impurities which, uniting with the soap, leave dark sticky deposits on the bath which are very difficult to remove. The geysers also require to be frequently taken to pieces and cleaned if the water is to be even moderately pure.

As far as the water supply is concerned, those geysers are the best in which the water does not come in contact with the products of combustion; and bunsen burners are better than open-flame burners, as they produce less smoke and consume less gas for the same amount of heat. Geysers of this type, however, must invariably have adequate ventilation flues.

In cheap geysers the water and gas have separate taps, and it is therefore possible to tight the gas and turn it on to the full before the water is turned on, or to leave the gas burning after the water has been turned off. In either case, the geyser may be damaged, if not absolutely ruined. The extra cost of fitting the geyser with a device by which the water and gas are controlled by a single tap is only a few shillings, and this arrangement ought always to be adopted.

In some geysers, the gas-lever contains a small branch-jet and tap; on the tap being turned the branch-jet can be lit, and this pilot-light can be then turned by the main lever into the body of the geyser, where it lights the large heating burners. In more expensive geysers, the whole of the burners are attached to a door, so that they can be swung outwards. This is a better arrangement, as the burners can be cleaned and kept in proper condition.

Geysers in which the water and products of combustion are kept entirely separate, not only preserve the water in its original purity, but allow it to be discharged at a higher level according to the pressure of the supply, as the water-receptacle is really a closed vessel, or a series of vessels, and performs the office of the ordinary bath boiler in a kitchen range. Geysers of this kind are often fitted with a rising pipe and shower-rose. The discharge pipe from the geyser is fitted with a cock, and the rising pipe is con-

nected between the cock and the geyser; when the cock is closed the water rises to the shower-rose, which acts, therefore, as an expansion pipe. Hot water may also be conveyed from the geyser to a lavatory, housemaid's sink, or other fitting; but if all the outlets are controlled by taps, an expansion pipe must be provided to relieve the pressure in the closed water receptacle of the geyser. Where, however, different fittings are to be supplied with hot water, a special kind of water heater ought to be used, in which a considerable volume of water can be stored and kept hot by a number of comparatively small flames kept constantly burning.

Sometimes the gas-burners are placed in a chamber under the bath, so as to warm the water after the bath has been filled, or during the process of filling; but this arrangement is not applicable to baths of every material, and in any case it is apt to damage the bath. Cast-iron baths have also been made with small furnaces under them, but for the same reason (and others) they cannot be recommended.

OBITUARY.

MR. F. BOREHAM.—We regret to announce the death, on the 25th inst., in his sixty-second year, of Mr. Frederick Boreham, of No. 23, Highbury-grange and Nos. 73 and 75, Finsbury-pavement, London. Mr. Boreham was elected an Associate member of the Royal Institute of British Architects in 1871. Amongst his later architectural works we may mention his plans and designs for an enlargement of Shirley's Hotel, No. 37, Queen-square, Bloomsbury; the Congregational church in Snakes-lane, at the corner of Ray Lodge-road, Woodford, built by Mr. C. North, whose contract amounted to 2,344; and the new Wesleyan church, with school, at Crowborough, Kent, built by Mr. G. Beard, of that place, of Bath and local stone. In October last Mr. Boreham gained the second premium (there were nineteen competitors in all) for his designs and plans for the new Wesleyan church in Durham-road, Sunderland.

GENERAL BUILDING NEWS.

CHURCH, HORFIELD, GLOUCESTERSHIRE.—The new Franciscan Church of St. Bonaventure has been erected near the Friary, Horfield. The site of the new church adjoins the Friary, and the building was erected at an expenditure of about 4,000. The design is Early English, and the building consists of a nave, chancel, side chapels, aisles, baptistry, confessionals, a choir at the west end, and another choir for the Friars over the chapel on the Gospel side, pierced with arched openings into the chancel. The nave consists of five bays. The bays at the west end are flanked by the tower on the Apostleside and by the baptistry on the Gospel side. The nave is divided from the aisles by an arcade supporting the main principals of the roof, which has a span of 48 ft., and covers both nave and aisles. The arches of the nave are over 30 ft. high. The chancel is divided from the nave by an arch 37 ft. in height, and is lit by three lancet windows in the bay of the aisles. The confessionals are placed on the Gospel side of the church, with openings formed through the aisle wall. The west end of the nave is pierced with three lancet windows. The entrance door is in the centre of the nave wall, and there is a smaller door in the tower, opening into the porch. The organ chamber is approached by circular stairs, built at an angle of the tower. The baptistry is apsidal in form, and is lighted by a lancet window in each bay. The tower, baptistry, and west end bay were not included in the contract for 3,800. The total length of the church is 90 ft., the width of the nave being 22 ft., the width across the church 48 ft., and the height from floor to roof 50 ft. The church is built of rubble stone with Bath stone dressing, and facings of blue stone. It will accommodate about 350 persons. The whole was designed by Messrs. Pugin & Pugin, including the Friary. The contractors were Messrs. R. W. Wilkins & Sons, of Bristol, and Bro. Patrick acted as clerk of works.

PRIMITIVE METHODIST CHURCH, LONGTON, STAFFORDSHIRE.—The Longton Central Primitive Methodist body has just opened a new building in Stone-road. The new building has been erected by Messrs. A. H. & J. W. Moore, of Longton, at a cost of about 4,000. The main building is a chapel, with gallery, having sitting accommodation for 600 people. Adjoining there is a schoolroom, and under the chapel there is a suite of classrooms and vestries.

REOPENING OF ST. MARY QUAY CHURCH, IPSWICH.—St. Mary Quay Church at Ipswich was reopened after restoration on the 15th inst. The work was carried out in three sections. The first section included repair of the roofs of the nave, north aisle, organ chamber, and south porch, the work being carried out by Mr. S. A. Kenny. The second section included the new oak block floors to the benches, new floors to the passages, and the general cleaning

and recoloring. This part of the work was carried out by Mr. A. Sadler. The remaining section of the work consisted in a street improvement, and was carried out by Mr. W. Pipe (part of the graveyard being given up to the road, and the boundary wall re-erected). The work has cost about 3,000. The church was closed early in 1898, the building being pronounced unsafe by the Architect and Diocesan Surveyor, Mr. E. F. Bishopp.

CONVENT CHAPEL, WORTHING.—The blessing of the chief stone of the new chapel which is being erected in the grounds of Notre Dame de Sion, Worthing, for the use of the inmates of the Convent, took place on the 19th inst. Built of brick, with Bath stone dressings, to the designs of Messrs. Elphick & Howell, of London, the new structure is estimated to cost some 4,000, when completed. Provision has also been made for a recreation-room underneath the chapel. As the building is intended to be for the use of the inmates of the convent, the main entrance to the chapel is from the cloisters, but a separate entrance to the sacristy is also provided from the garden for the use of the priests. The floor both of the chapel and the recreation-room underneath is to be laid with maple wood blocks, and the Fawcett system of fireproof flooring has been employed.

PRESTONFIELD CHURCH, EDINBURGH.—It is proposed to erect Prestonfield Church, in Dalkeith-road, alongside the present iron building. In the meantime only a part of the building is to be erected, sufficient to meet present requirements. The plan includes a nave (the part now proposed to be built), capable of accommodating 500 persons, without galleries; a north and south transept and a circular apse, which will give additional accommodation for 300, thus making a total of 800. On the south side and near the west end of the church there will be a circular tower. This tower will on the ground floor form an entrance porch, having a projecting doorway to the outside. The octagonal part of the tower will be finished with an ornamental parapet, and the whole will be crowned by a low octagonal stone spire. The pulpit will stand against the pier at the junction of the north transept and apse, which will contain the communion table. The organ will be at the west end. There is room on the site for a church hall and other offices. In the meantime a session-house and vestry are to be provided, below which will be situated the heating chamber. The architects are Messrs. MacGibbon & Ross.

PUPIL TEACHERS' INSTITUTE, GOVAN.—The new Pupil Teachers' Institute, which has been erected within the grounds of Bellahouston Academy by the Govan Parish School Board, was opened on the 22nd inst. The building is two stories in height, and has a frontage to Paisley-road. The style is Scotch Baronial, and is in harmony with the Academy building. There are four classrooms and a physical laboratory on the ground floor, with access to each from a central hall, also headmaster's room, male and female teachers' classrooms and lavatories. On the upper floor there are four classrooms, which will be used for art and clay modelling, and, in addition, a chemical laboratory and lecture-room. The art rooms are divided by patent folding doors forming three classrooms, but can be thrown into one large room if required. At the rear of the main building there has been erected a workshop and a cookery-room. The institute is illuminated throughout with electric light. The estimated cost of the buildings, which were designed by Messrs. Bruce & Hay, architects, is 10,500.

BOARD SCHOOL, HALIFAX.—A new infants' school has just been opened in the Queen's-road, Halifax. The building, which is one story in height, has been erected from plans by Messrs. Walsh and Nicholas. It comprises a central hall 62 ft. long by 30 ft. wide, six classrooms and two babies' rooms, with cloakroom and other conveniences. Included in the scheme, but in a separate block, there are also a cookery and manual workshop, to be used by the boys and girls attending Queen's-road School. The school is provided with the electric light, and is ventilated on the plenum system. Altogether, including the site, the cost incurred represents a total of 8,800.

THEATRE, NEWCASTLE.—The Town Improvement Committee of the Newcastle Corporation had plans before them on the 20th inst. for a proposed new theatre in Westgate-road, between the Tyne Theatre and Blenheim-street. They had been prepared by Mr. D. C. Wylson, of London, and provide for a building with a frontage of 69 ft. to Westgate-road and extending 150 ft. back. There are to be six entrances from Westgate-road and exits to Temple-street from the stage. Accommodation is to be provided for about 2,500—1,535 in the gallery. There is to be a public balcony in front of the building, stretching the whole length, and extending 8 ft. over the footway. The architect having adopted some minor alterations suggested by the committee, the plans were approved.

BOARD-ROOM, NEWTON, HANTS.—A new board-room is being erected in East-street, Newton. The new building is to be erected of Kingsteignton limestone, with Bath dressings, by Mr. Lewis Bearn, of Highweek, from designs by Mr. S. Segar. It will be 41 ft. long, 30 ft. wide, and 20 ft. high. Adjoining will be three rooms, containing waiting-room for applicants for relief, gentlemen's and

ladies' cloakrooms, and lavatories. Over the rooms will be the caretaker's-room, offices, and nurses' sitting-rooms. The existing board-room is to be adapted as receiving wards for males and females.

TECHNICAL INSTITUTE, CONSETT, DURHAM.—The new technical institute at Consett, which has been built and finished at a cost of about 5,000*l.*, has just been opened. The institute occupies a site at the north end of the town, facing into Park-road—the main thoroughfare between Consett and Blackhill. The building is set back from the road 16 ft., and the site is fronted by a wrought-iron palisade. The exterior walls are faced with deep red pressed brick and Dunhouse stone dressing. The principal entrance has a deeply recessed arched doorway, with carved spandrels forming the chief feature in the facade, and leads through a vestibule, with ornamental glass screen, into the entrance hall, from which direct access is obtained to the whole of the ground floor rooms. Right and left of the entrance are ladies' and gentlemen's retiring-rooms, with lavatory accommodation. Immediately opposite is the secretary's or headmaster's room, with large store-room adjoining. On the left side of the hall are two class-rooms, and on the right side of the hall is the physics laboratory. The whole of the hall is the physics laboratory. The first floor consists of a chemical laboratory, storeroom, balance-room, and preparation-room, lecture-room, classroom, and an art-room. The second floor, which has been designed with the view of being adapted for use as an art-room, with storeroom, cloakroom, &c., in the future, will at first be utilised as caretaker's apartments. Detached from the main building is a large room, 47 ft. by 16 ft. wide, to be devoted to the teaching of manual instruction. The general contractor for the building is Mr. Edward Taylor, of Durham, and the painting was entrusted to Mr. Joseph Siddie, of Consett. The wrought-iron work has been executed by Mr. J. R. Crimmon, of Gateshead, and the stained glass by Messrs. Reed & Millican, of Newcastle. The architect is Mr. C. E. Oliver, of Consett, and Mr. John Simpson, of Blackhill, acted as clerk of the works.

FOREIGN.

FRANCE.—The subject set by M. Pascal to the ten candidates for the Prix de Rome is characteristic; it is "An American Academy on the Banks of the Seine at Auteuil."—M. Louis Bonnier has been elected President of the "Société des Architectes Diplômés" for 1901.—Mme. de Neuville, the widow of the military painter, has left to the Louvre several pictures by her late husband, as well as his portraits by Duez and Mathey. She has also left her jewellery to the Académie des Beaux-Arts, to found an "Alphonse de Neuville" prize for the encouragement of young artists who are not well off.—Parliament has authorised the City of Paris to spend nearly 8 million francs on the enlargement of the reservoirs of the Avre at Saint Cloud and for the removal to Auteuil of the pumping-machine at Chaillot, as well as on other works connected with sanitation.—Parliament has authorised the construction of a bridge over the Tancarville Canal, at the Pointe du Hode, at a cost of 140,000 francs.—The chateau of Versailles is at last cleared of the scaffolding which for several years have partly hidden the façade towards the gardens.—M. Peynot, the sculptor, has just completed the model for a monument to François, the landscape-painter, to be erected at Plombières. The monument, the architectural portion of which will be by M. Godefroy, comprises a stele supporting a bust of the painter, flanked by two female figures, in 1874, and has lately published its proceedings to the end of 1898. In these twenty-four years it has done much excellent work, having rescued many interesting and beautiful fountains which were in neglected streets and transferred them to worthy localities. It has also saved a vast number of frescoes, cleaned off the whitewash with which they had been smeared, and opened them to the public for exhibition. Above all, it has saved a noble gateway of Alfonso of Aragon from destruction. Quite recently a collection of Capo di Monte china in Naples, said to be the finest in the world, has been dispersed. The Italian Government appointed a committee of experts to examine the collection, and they selected a number of standard specimens from each period of the manufacture. These have been photographed, and from the photographs coloured pictures will be executed. The result should be a valuable work on the history of Neapolitan ceramics.—*Times.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The business of the late Mr. C. B. N. Shewin, timber merchant, of Hatton-garden and Farringdon-road, has been converted into a private company under the title of "C. B. N. Shewin & Sons, Limited."—Mr. M. H. Hadland, surveyor, has removed his office from New Bridge-street to St. Clement's House, St. Clement's-lane, Lombard-street, E.C.

A CENTRAL TOWER FOR TRURO CATHEDRAL.—At a meeting of Truro Cathedral General Committee on the 21st inst. it was announced that the donor of 10,000*l.* for the erection of a central tower was Mr. J. H. Dennis, Arrowe Hall, Cheshire, formerly of Redruth. Mr. Dennis wished the designation of the tower should be the Victoria Tower.

LONDON GEOLOGICAL FIELD CLASS.—The season of Saturday afternoon excursions, conducted by Professor H. G. Seeley, F.R.S., will commence on April 27. Visits will be made on each Saturday to places both north and south of London to examine the geological features of the Thames basin. Further

particulars can be obtained from the Hon. General Secretary, Mr. R. Herbert Bentley, 43, Gloucester-road, Brownswood Park, N.

MEDICAL HOURS.—Medical inspection had been made at Hounslow Barracks, which is finished inside with "compo-board" by the British Compo-Board Company, instead of the usual matchboarding. We should think this would be an improvement on the boarding, both in the sense of appearance and of sanitary fitness.

SALARIES IN THE OFFICE OF WORKS.—It appears from the detailed statement furnished to Parliament in explanation of the estimate of 46,450*l.* for the salaries and expenses of the office of the Commissioner of his Majesty's Works and Public Offices that there are in the surveyors' division two principal surveyors, one receiving 1,200*l.* a year and the other 1,000*l.*; five surveyors at 500*l.* a year each, rising by annual increments of 25*l.* to 800*l.*, two of whom are in receipt of another 100*l.* a year each in respect of extra duties; nine first-class assistant surveyors at 310*l.*, rising by annual increments of 15*l.* to 450*l.*; sixteen second class assistant surveyors at 150*l.*, rising by increments of 10*l.* to 300*l.*; two draughtsmen at 210*l.*, rising by increments of 10*l.* to 250*l.*; nine first-class clerks of works at 250*l.*, rising to 300*l.* (with some allowances in respect of extra duties); and twelve second-class clerks of works at 150*l.*, rising to 200*l.*. All these officers who serve up to the age limit of retirement become in due course entitled to superannuation. The first-class assistant surveyor employed in China and Japan occupies an official residence, receiving the salary of a surveyor, and has besides a foreign service allowance of 100*l.* per annum, the maximum of salary and allowance being limited, however, to 750*l.* Another of these officers has a personal allowance of 100*l.* per annum; technical assistants as required, and it is notified that no fresh appointments will be made to the rank of permanent draughtsmen. Twelve of the second-class clerks of works receive an annual allowance not exceeding one-sixth of salary in lieu of apartments; one has an official residence. One of the first-class clerks of works, being in charge of the Embassy buildings at Constantinople, &c., receives an extra acting allowance of 100*l.* per annum and has a residence. The number of first-class clerks of works is to be reduced from nine to eight eventually, and the number in the second class will then be increased from twelve to thirteen.

THE PRESERVATION OF ARTISTIC REMAINS IN ITALY.—The adequate preservation from destruction by individual owners of ancient buildings and monuments is one of peculiar difficulty in a country like Italy, which is full of remains of the highest interest. In discussing this subject in his last report our Consul in Naples says that, year by year, now a church, now a gateway of a castle, or even the castle itself is declared to be a national monument. Treasures bought by dealers from remote villages are constantly pounced upon, and permission to export them is refused. No picture may leave the country without being submitted to experts, who have to decide whether it forms part of the historical art of the country or is itself of such artistic value as to necessitate its retention. At Naples, and probably in all the important towns of Italy, there is a special commission consisting of sixteen members, presided over by the Syndic, who are appointed for four years. It is the duty of this commission to discover interesting things in the city which have not been noticed before, to prevent the disfigurement of those already under their care, and to keep the whole in repair. The Naples committee was established in 1874, and has lately published its proceedings to the end of 1898. In these twenty-four years it has done much excellent work, having rescued many interesting and beautiful fountains which were in neglected streets and transferred them to worthy localities. It has also saved a vast number of frescoes, cleaned off the whitewash with which they had been smeared, and opened them to the public for exhibition. Above all, it has saved a noble gateway of Alfonso of Aragon from destruction. Quite recently a collection of Capo di Monte china in Naples, said to be the finest in the world, has been dispersed. The Italian Government appointed a committee of experts to examine the collection, and they selected a number of standard specimens from each period of the manufacture. These have been photographed, and from the photographs coloured pictures will be executed. The result should be a valuable work on the history of Neapolitan ceramics.—*Times.*

STRAND IMPROVEMENTS.—On the 25th inst. at the Westminster Guildhall, before Mr. John Troutbeck, High Bailiff, and a jury, the case of "Hughes's Trustees v. the London County Council" was decided. It was a claim for compensation for the compulsory acquisition of the freehold of the premises, 25, Holywell-street, at 28 and 29, Newcastle-street, in connexion with the Strand improvement scheme. In opening the claimants' case Mr. C. A. Cripps, K.C., said that the jury would have noticed that the property which they had just viewed was in a very dilapidated condition, and the claimants were therefore only claiming in respect of the value of the land. The superficial area of the Holywell-street portion was 912 ft., and they had put the value at

6s. 6d. per foot. In Newcastle-street there was an area of 1,365 ft., which their surveyors would set was worth 5s. a foot. Witnesses would be called to prove that the total value was between 10,000*l.* and 20,000*l.*, but under their betterment scheme the London County Council were entitled to something like 3,000*l.* out of that sum, so his clients' claim came out at about 16,500*l.* Mr. Charles Augustus Lar (Jones, Lang, & Co.), surveyor of King-street, Newcastle, said he was of opinion that the who of the property was worth about 16,377*l.* E agreed with the price per foot mentioned by learned counsel, and would give twenty-nine year purchase. By Mr. Boyle: He did not think twenty years' purchase would meet the requirement of the case. Mr. P. E. Filditch, of Pall Mall agreed with the previous witness's figures, with the exception that he thought twenty-eight year purchase was fair. Mr. Benjamin Breach (Far brother, Ellis, & Co.), of Fleet-street, said his estimate amounted to 16,207*l.* This closed the claimants' case. Mr. Boyle, K.C., on behalf of the London County Council, said that was marvellous how property increased in value when it was wanted for a public improvement. He contended that the outside sum the jury ought to award was 10,500*l.* Mr. Edward Farmer (Debenham, Tewson, Farmer, & Co.), gave evidence to the effect that the claimants would be fairly compensated if they received 10,500*l.* Mr. Furber (Furber & Price), of Warwick-court, Gray's Inn, confirmed Mr. Farmer's evidence and figures. Mr. James Green (Weatherall & Green), of Chancery-lane, said his total was 10,517*l.*, or 7*l.* more than the two preceding witnesses. The jury retired to consider their verdict. After twenty-five minutes' deliberation they awarded the claimants 13,800*l.*

THIS HOUSE'S QUESTION.—ROCHDALE.—conference on housing reform, promoted by the local Trades Council, was held recently in the Rochdale Town Hall. Mr. James Firth, Secretary of the Trades Council, moved:—"That, in view of the overcrowding and bad housing conditions that prevail in our midst, this conference urges on the Town Council the adoption of Part III. of the Housing of the Working Classes Act, 1890, and the vigorous use of the powers they already legally possess." It further urges the formation at once of a local housing committee, on the widest possible basis, to further this object, and that this resolution be forwarded to the Town Clerk." Archdeacon Wilson, in summing up the discussion, said in suggestion that the Corporation should become possessed of the whole of the houses of the working classes was surely so gigantic that it might well be relegated to a very distant time. It is only a portion of the land and some of the dwellings were in the hands of the Town Council, would they be devoted to a particular class, and would the class for which they were intended go into them? That was the case in London, in the Peabody and other buildings. They were used by a higher class. If restriction had been invented yet which would limit those buildings to the people for whom they were intended. He asked whether it was justifiable to spend money out of the rates for the benefit of a class. At present they were attempting to do with the question by side attacks, and in Rochdale not wholly unsuccessfully. There were 24,000 houses built and owned or built and sold by the cooperative societies, or built with money advanced from them. Those premises had been erected at a cost of over five millions. The Archdeacon emphasised a suggestion made by the Rev. H. Edmonds that the council should take the lead in these matters upon the Sanitation authorities. There should be a public register, he said, of all the houses to let, and should be the duty of the inspector to report upon those houses as they fell vacant, and say whether they were fit for habitation. All sanitary regulations should be made compulsory. The action of trades-unions had largely increased the cost of building by limiting the work done. In one case a cottage was built for 108*l.*, which would have cost 150*l.* if done by contract. The reason was that the people built it themselves, and put into it as much work as they could instead of as little as they could. Unless our trades-unions adopted a more sound basis of economics than at present there was trouble before England, and it would not be confined to the building trade. The amended resolution as given above and an amendment were put to the vote, and the resolution was carried by a majority of 10. Afterwards it was carried almost unanimously.

INSTITUTE OF BRITISH DECORATORS.—The annual meeting of the Northern District of Institute of British Decorators was held at the Great Northern Hotel, Leeds, on the 22nd inst., business being the election of officers and committee for the ensuing year. The following were appointed:—Chairman: Councillor John Smith, Sheffield; vice-chairmen: Alderman Kendall, Huddersfield; Mr. Thomas Preston, Burnley; George G. Laidler, Newcastle-on-Tyne; and Mr. George F. Allan, Stockton; treasurer: Mr. Geo. Spencer, Bradford; committee: Messrs. J. G. C. Newcastle; James Tetlow, Huddersfield; J. F. Cliffe, Bolton; W. H. Cunliffe, Blackburn; and J. Cantrill, Manchester; secretary: Thomas Fox, Padiham. It is the intention of the committee to arrange for lectures to be delivered next winter by some of the principal towns comprised in the Northern District.

BRISTOL MASTER BUILDERS' ASSOCIATION.—On the 10th inst. the annual dinner of the Bristol Master Builders' Association was held at the Royal Hotel. Mr. George Emphreys presided, and there were present the Right Hon. the Lord Mayor of Bristol (Mr. J. Colthurst Godwin), Mr. August Krauss (President of the National Federation of Building Trades' Employers of Great Britain and Ireland), Mr. Tom T. Lindrea (President of the Bristol Chamber of Commerce), Mr. Frank Willis (President of the Bristol Society of Architects), and others. The loyal and patriotic toasts having been honoured, Mr. Frank N. Cowlin proposed "The Right Hon. the Lord Mayor and the Corporation of the City of Bristol." The Lord Mayor, in responding, said that if they were to hold their own with the cities of the world, they must extend their locks at Avonmouth in order to grapple with the trade. He hoped they would send some of the builders to the Council in addition to Mr. Bastow. He would like to see Mr. Krauss, Mr. Cowlin, and some others take their part as members of the Corporation. Alderman Pearson proposed "The Trade and Commerce of Bristol," and Mr. T. Lindrea responded. Mr. E. Walters proposed "The Architects and Engineers," and spoke of the good relations which existed between them and the builders. Mr. Frank Willis, Mr. Henry Williams, and Mr. J. Scoones replied to the toast. Mr. Bastow (in the absence of Mr. Arthur Lee) proposed "The National Federation of Building Trades' Employers of Great Britain and Ireland." In a toast, in responding to the toast, said that the toast he had to respond to might appear to some of them a new one, but it was not so; with the New Year the National Association of Master Builders changed their title to the National Federation of Building Trades' Employers of Great Britain and Ireland. For a long time it had been felt that federations were badly wanted, and they were glad to see their federation was getting stronger every day, and that kind associations, particularly in the north, joined their federation. They had drawn up new rules, had a first mode of electing their council, and had much improved their contract form, which they hoped would meet with approval from architects, engineers, and municipal councils, as fair contract would do away with a lot of differences between builders and their clients. The four federation centres had now over six thousand members, and the question arose as to a crest. Several designs were submitted but none of them was approved, but last week he received a suggested design of crest from their honourable vice-president, Mr. J. S. Jones, Liverpool, which was very artistic, and most likely would be accepted. That crest he would have to bring forward at their next half-yearly meeting at Glasgow. He was glad to inform them that they had an emergency committee consisting of two members of each federation—Mr. Church, Bristol, and Mr. Long, North, represent the West of England centre. Through that committee he had good hope that some differences, if they did occur between themselves and their employees, might be settled without strikes. At their last half-yearly meeting in London he said all strikes must come to an end sooner or later, and therefore why not try to settle disputes without strikes? Only last year 150,000l. was lost in wages in the building trade alone, and they hoped that would not be the case this year. The building trade strike in Chicago, which lasted twelve months, and which must have cost an enormous sum of money, was settled last month. The principal provisions in the agreement were: No limitation of days' work; no restriction on the use of machinery or tools; no restriction on the use of materials manufactured by non-unionists except prison-made; use of apprentices allowed; foreman to be agent of employer instead of unions; workmen to work for whom they please; employers to be allowed to hire or discharge whom they pleased; wages to be 6s. 0d. per hour. When reading that he thought it should be very satisfactory to both parties.—Mr. G. Wilkins proposed "The South-Western Building Trades' Employers' Federation and Local Unions Associations." The toast was spoken to by Alderman H. J. Spiller (Taunton) and C. H. Long (Bath). Mr. G. H. Fernin submitted "The Bristol Master Builders' Association." The President, in responding, said it was now some six or seven years ago (since he had the honour to preside over the annual dinner, and it is that time they had seen many changes, and they could not but deplore the death, during the past year, of their esteemed late vice-president, Mr. G. M. Gosling, a gentleman of large experience in the building trade, and whose loss was a severe blow to the Association.—Mr. E. Walters then took the chair as President of the Association amidst much applause.

NORTH STAFFORDSHIRE BUILDERS' ASSOCIATION.—The annual dinner of the N.S. Builders' Association was held at the Grand Hotel, Hanley, recently. The chair was taken by Mr. J. Gallimore, President of the Association. "The King," on the initiative of the President, having been accepted, the following toasts were proposed: "The Local Governing Bodies." The Mayor of Hanley, the Mayor of Stoke, and the Mayor of Newcastle responded. The Mayor of Longton, the brother of a builder, and "The Master Builders' Association." By way of reply, the Secretary of the Association (Mr. Owen) read the annual report, which stated that

95 per cent. of the builders in the district are members of the Association, all of whom have insured their workmen at special low rates against liability for accidents of all kinds. The Association would no doubt form the nucleus for a North Stafford Builders' Provident Institution of a Builders' Exchange. The stonemasons had given notice of an advance of 3d. per hour. The Association has offered them 3d. The labourers have also given notice for an advance, but as the notice was not sent as per rule or custom, the employers have decided not to entertain it. The bricklayers of Leek have also given notice for an advance. During the last thirty years wages in the building trade in this district have risen 90 per cent. and building materials 40 per cent., 25 per cent. of this took place two years ago. The Association is anxious to have a uniform contract, similar to the one used by the National Builders' Association which contains an arbitration clause, and of which contract 2,000 were used in England during the last half-year. Some difficulty has arisen owing to the law having decided that an estimate as now sent in shall or may form a contract. The following form of tender is, however, being prepared to meet this, and the architects are to be requested to use them:—"This estimate, if accepted, is subject to an approved written contract, and is not to be taken as in itself to constitute a contract." Something like this was necessary, as errors of all sorts sometimes occurred in tenders, and an opportunity should be given to rectify them. Councillor Yosall, J.P., gave "The Architects and Surveyors." Mr. Lyman, Mr. Dain, Mr. Scrivener, Mr. Wood, and Mr. Snape responded. Councillor Cartledge proposed "The Magistrates," and Messrs. E. Walley and W. Grant acknowledged it. Councillor P. H. Bennion gave "The Building Trade," and referred to the splendid organisation of to-day as compared with the utter disorganisation of a few years ago; to the fact that there was less of the cut-throat competition and a waning desire to fill jobs at anything but a paying price; to the good wages paid for labour and to the vanishing jerry builders. Mr. Gallimore replied.

SUTTON PLACE, NEAR GUILDFORD.—The recent sale of the contents of Sutton Place, including some one example of seventeenth and eighteenth century furniture, produced a total of 4,000l. It seems a pity that the house, which, we read, has been rented by a well-known newspaper proprietor, should have been thus deprived of its equipment, which so well harmonised with the house itself. The annals of Sutton Place, with architectural drawings to scale by Mr. C. F. Hayward and Mr. A. Gladding, have been compiled by Mr. Frederic Harrison in a handsome volume published seven years ago. Built in 1530 by Sir Richard Weston, an adventurer and a courtier who had travelled abroad, it is chiefly interesting as a very early example of a large residence erected without any view to its defence, and of an attempt to incorporate Italian detail in English workmanship with the copious use of terra-cotta as at Layer Marney. The gate-tower front was destroyed in the latter part of the eighteenth century. There now remain three sides of the main quadrangle and a smaller court entered from one of the wings. The quadrangle is distinguished by its high Tudor windows having cusped heads and flat-pointed doorways with dressings of terra-cotta blocks, fashioned as masonry, and enriched with ornament after the Italian style, which are freely introduced amongst the jambs, transoms, mullions, and mouldings of our own native masons' work. Around the courtyard, which is 80 ft. square, are about forty apartments, the hall being on the side opposite the former entrance tower.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on Thursday, March 21, at the Society's house, Dean's-yard, Westminster, in the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, namely: building the first portion of the proposed new Church of St. Michael and All Angels, Ocklyng, in the parish of St. Mary, Eastbourne, 100l.; and towards enlarging or otherwise improving the accommodation in the churches at Ravensthorpe, St. Saviour, near Dewsbury, 100l. in lieu of a former grant of 25l.; Bewcastle, St. Cuthbert, near Carlisle, 15l.; Little Oakley, St. Mary, near Harwich, 50l.; and Whicham, St. Mary, near Carnforth, Cumberland, 20l. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Churwell, in the parish of Morley, near Leeds, 25l.; and Willesden St. John the Baptist, Middlesex, 50l. The following grants were also paid for works completed: Hales, St. Margaret, Norwich, 15l.; Westcliff, St. Alban, Southend, Essex, 50l.; Belsford, St. Peter and St. Paul, near Horncastle, Lincoln, 25l.; and South Ossett, St. Aidan, near Wakefield, 20l. In addition to this the sum of 270l. was paid towards the repairs of thirty-one churches from trust funds held by the Society. The annual general court of the Society will be held at 3 p.m. on Friday, May 17, at the Church House, Dean's-yard, Westminster, when the chair will be taken by the Archbishop of Canterbury, President of the Society.

LEGAL.

DISPUTE BETWEEN A BUILDER AND THE CORPORATION OF BRISTOL.

THE case of Krauss v. the Mayor and Corporation of Bristol came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Collins and Romer, on the 25th inst., on the appeal of the defendants from an order of Mr. Justice Grantham refusing to refer to arbitration a dispute between the plaintiff, a builder, and the Corporation, in reference to a certain contract in connexion with the Bristol Lunatic asylum. The action was brought for alleged delay and interference with the plaintiff in executing his contract, thus causing him loss of time and additional expense. The Corporation contended that the matter in dispute was one to be referred under contract to arbitration, and that whatever delay was occasioned to the plaintiff was owing to his having laid down unseasoned wood which the architect had rejected. For the plaintiff it was submitted that the action was one in regard to a matter outside ordinary disputes, and that he was prevented from proceeding with his contract because the isolation hospital of the asylum had not been supplied with the heating apparatus in good time, and of another contractor not supplying the grates at the proper time, thus delaying the laying down of the floor of the hospital. Counsel for the plaintiff contended that such issues as were raised by the present case could not properly be determined by arbitration, but it was a proper cause for the King's Bench Division.

In the result their Lordships held that the matters in dispute ought to be settled by arbitration, and made an order accordingly. They therefore allowed the appeal with costs, and stayed the action.

CASE UNDER THE BUILDING ACT.

AT Greenwich Police-court, on the 20th inst., Walter Hill & Co., Limited, of Southampton-row, W.C., were summoned by the London County Council for erecting on the forecourts of certain houses in Sydenham a structure in contravention of Part III. of the London Building Act. Mr. Chilvers appeared for the Council, and Mr. Bethune was counsel for the defence. Mr. Chilvers said that the structure, which was erected without the consent of the Council, was an advertising hoarding 12 ft. in height and 336 ft. in length, and was entirely in advance of the general building line. The attention of the Council was drawn to the structure in September last year. Mr. Bethune argued that the hoarding differed in no respect from an ordinary builder's hoarding, and that it practically enclosed vacant land, as the houses, which belonged to the Leathersellers' Company, were in a bad condition and, with one exception, unoccupied. The houses were about to come down. Times were bad enough just now, and he did not think the owners could be blamed for seeking to get some income from the hoarding. He argued that the hoarding was not a structure to which the Act applied, and that it was a temporary erection. Evidence was called on both sides, and eventually Mr. Kennedy said that there was a degree of permanence about the erection, which had been standing six months and was very likely to remain. He regarded the hoarding as a structure, and could not recognise it as enclosing only vacant land. There would be an order to remove the structure with fourteen days, and the defendants would be fined 40s. and five guineas costs.—Times.

CARPENTER'S CLAIM FOR COMPENSATION UNDER THE WORKMENS COMPENSATION ACT.

THE case of Whitehead v. Reader came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Collins and Romer, on the 26th inst., for judgment on the appeal of the defendant, the employer, from the award of the County Court Judge of Coventry under the Workmen's Compensation Act, 1897, awarding the applicant, a carpenter and joiner, compensation at the rate of 12s. 6d. a week, being one-half of his average weekly earnings, for an accident which happened to him whilst in the employ of the defendant.

It appeared that the applicant was sharpening one of his tools at a grindstone, which was worked by a leather band which passed over shafting connected with a gas-engine. The band slipped off the stone, and the applicant, in trying to replace it, sustained personal injuries. The case for the defendant was that the applicant had orders not to touch the machinery, and in trying to replace the band was acting contrary to orders. It was also contended on the defendant's behalf that the accident did not arise out of and in the course of applicant's employment, on the authority of Lowe v. Pearson. The County Court Judge, however, decided that the case of Lowe v. Pearson did not apply, and made an award in favour of the applicant, as before stated. Hence the present appeal of the employer.

The Master of the Rolls, in giving judgment, said that the only point on the appeal was whether the injury to the applicant arose out of and in the

course of his employment. It was clear that the man was employed on a factory within the meaning of the Act. It appeared to his lordship that the injury, *prima facie*, arose out of and in the course of the applicant's employment, but the man had been told not to touch the machinery, and it was said that this caused the injury not to have arisen out of and in the course of his employment. The question was, did disobedience to this order cause the man not to have been injured in the course of his employment? He thought not. It could not be said that every disobedience to an order terminated a man's employment. Disobedience might or might not give a defence to a master under the clause relating to serious and wilful misconduct. He thought that the learned County Court Judge was right in holding that the case of "Lowe v. Pearson" had no application to the present case. That was not a case of any employment at machinery at all, and the applicant in that case clearly went outside his employment and, in addition, disobeyed the express orders of his master. In the present case the applicant's course of employment was to grind tools at the grindstone, and though he was told not to touch the machinery, still he was in the course of his employment when, in trying to adjust the band after it came off, he was injured. In his opinion the County Court Judge was right in coming to a conclusion in favour of the applicant, and the appeal must be dismissed.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs. Their Lordships refused a stay of execution pending an appeal to the House of Lords.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

AT the Southwark County Court on Tuesday, before his Honour Judge Addison, K.C., and a jury, Messrs. J. Aird & Sons, Belvedere-road, Lambeth, were sued by Wm. Moore, labourer, of York-road, Teddington, who sought to recover compensation under the Employers' Liability Act for alleged personal injuries. Mr. Turrel was counsel for plaintiff, and Mr. Scarlett for the defendants. Mr. Turrel said the plaintiff, when in the service of the defendants, was employed on the River Diversion Works which were being executed at Kempton Park. On September 19 last he was sent to work in a trench about 27 ft. deep in which a 48-in. main was being laid. The sides of the trench were supported by struts, and a ladder reached from the bottom to within some feet of the top, so that the men had to climb up part of the way by means of the struts. The plaintiff called the attention of the foreman to the fact that the ladder was too short, but no notice was taken of the complaint. On the day mentioned he descended by the ladder and worked by himself in the trench until dinner-time. When the call was made he walked to where the ladder had been, but found that some one had drawn it away. Consequently he started to climb the struts, and when he had nearly reached the top a "punch" which he caught hold of gave way, and he fell to the bottom. He alighted on his feet, and being a heavy man and fifty years of age, he was much shaken and upset. He ultimately got out of the trench by crawling through the pipe a distance of about 240 yards. He did not speak to any one about the accident, and finished his work, although feeling very ill. He kept his own counsel for ten days, but at the end of that time he had become so ill that he had to give up and take to his bed. Then a letter was written to the defendants informing them of the accident and his condition. He was attended by a doctor, and he was unable, as the result of the accident, to do any work for a period of sixteen weeks. His wages averaged 32s. per week. He relied in this case on the first subsection of Section I. of the Act in that there was a defect in the ways, works, machinery, or plant connected with or used in the business of the defendants, notice of which defect had been given.

The plaintiff was called, and bore out counsel's statement, adding that there was not a ladder at that part of the works 21 ft. 6 in. or 34 ft. long. He had never seen men climb up by the struts when ladders were available.

Dr. Atkinson, of Hampton Hill, said he examined the plaintiff on September 29, and came to the conclusion that he was ruptured. He, however, subsequently discovered, when in consultation with the defendants' doctor, that this was not so. The plaintiff did suffer great pain in his arm. He was surprised that plaintiff could continue work for ten days after such a fall.

Thomas Challis, defendants' foreman, declared that there were two ladders over 30 ft. in length which the plaintiff could have used, and that not a word about any fall was mentioned until the letter from the plaintiff was received. He did not notice anything unusual about the plaintiff, who was not at work by himself at any time.

Several witnesses were called, who stated that they were working with the plaintiff on the day of the alleged fall, but they did not notice anything wrong with the plaintiff or that his clothes were more muddy than usual.

Before the completion of the defendants' evidence his Honour stopped the case, remarking that there was every circumstance of grave suspicion

against the plaintiff. It would be a terrible thing if men were allowed to make such complaints ten days after an alleged accident and maintain action upon them.

The jury expressed the opinion that they were quite satisfied that plaintiff had no case, and the action was, therefore, struck out, with costs against the plaintiff.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

23,406.—KILNS FOR DRYING AND BURNING TILES, POTTERY, &c.: G. Müller and P. Pfeiffer.—Wagons are drawn through the heating-chamber in order that the green goods with which they are loaded may be exposed to hot gases flowing from the furnace through flues to the exhausters, and be then exposed to the heated air which is drawn by exhausters. The goods are next transferred to other carriages and conveyed through the burning chamber; they are allowed to become cool whilst the following charge is being dried in the heating chamber.

23,413.—ARMATURES FOR DYNAMO ELECTRICAL MACHINES: M. H. Robinson and M. H. P. R. Strakey.—In the case of a dynamo-electrical machine wherein the armature or revolving portion is directly coupled on to the fly-wheel of the engine, the inventors discard the customary dynamo-shaft, and they, instead, cast the spider or boss with a central extension so that it shall form a journal to run in the bearing.

23,451.—A SAFETY APPLIANCE FOR WINDOWS: J. J. Harley.—The inventor's object is to provide means of controlling the opening of window-sashes in asylums and similar buildings and of frustrating attempts to remove the sashes from their frames. They place L-shaped pieces of the sash in engagement with corresponding projecting pieces inserted into the pulley stile. When the sash has been caused to slide so that those pieces are clear from one another it can be removed; for the L-shaped pieces may be substituted a stud upon the frame that will engage with a slot either in a metal plate upon the sash-stile or in the sash-stile itself.

23,458.—CONSTRUCTION OF FIREPROOF CEILING: M. H. H. Phillips.—The inventor fashions slabs or blocks (which may be hollow or solid), so that they shall be askew in a diagonal direction, or in the direction of their length or breadth, and shall have their abutting surfaces curved, or plane, or zig-zagged, with grooves in their sides for taking keys of mortar or iron rods. The blocks are formed with inclined sides, so that a ceiling may be built up without the use of props and centres.

23,498.—A PLUG FOR TAMPING BORE-HOLES AND STOPPING PIPES: J. Bovier.—An expansible plug, that may be afterwards removed, is made up of a set of split cones. Where two cones are used, having a groove for the fuse, a tube is joined to one end wedge and a rod is screwed on to the other. On the end of the tube is a nut, through which is passed a screwed sleeve that presses against stops on the rod, whereby as the rod is turned up the wedges can be driven either asunder or together. The rod, sleeve, and nut have handles, and the tube is retained against the hole with a washer and a clamp.

23,510.—TREADS AND RISERS OF STAIRS: E. Wood & Co. and H. P. Butler.—Pressed steel plates having flanges at their ends and non-slipping upper surfaces, with corrugations and projections, constitute the treads, whereof the front edges may be extended downwards up to the next tread so as to make a riser, or be turned downwards to make the stair-nosing. The inventors bolt or rivet the risers on to the tread-flanges, and similarly fasten the flanges to the stringers. End-plates can be used for joining the flanged treads, and the risers can be cut away for making a partly open staircase.

23,514.—A BRAKE MECHANISM FOR HOISTS, &c.: W. T. Eades and E. Allday.—A pinion, or a train of wheels imparting the slow motion, communicates movement from the first motion shaft, and the pinions of the train are arranged upon a common boss, a collar, having a cam-shaped end in engagement with a corresponding end upon a sleeve that moves loosely upon a fixed shaft and is held in a bearing, being screwed within the boss. During the operation of lifting, the sleeve and the collar turn together in unison without separating from one another lengthwise, but as the load begins to fall the power being removed—it exerts an expanding force between the collar and the sleeve, and so puts the brake into play. Stopping-pins limit the extent of the displacement lengthwise of the sleeve. A sheave and a weighted chain, or a spring, may be employed instead of a lever (for controlling the pressure) of which the boss is threaded upon the screw-threaded end of the fixed shaft.

23,576.—RADIATORS FOR HEATING BUILDINGS: M. M. Brophy.—Hot water is admitted near the top of the radiators which have hinged sections or leaves, one of which is pivoted upon a hollow foot on to which the supply and return pipes are secured. The foot and the socket are joined by means of a flanged connecting ring, that will turn upon the bearing surface of the foot, and is kept in its place with a gland. At the free end of the radiator is a roller or bearing-wheel for meeting inequalities in the floor, the wheel being mounted in a box that

slides within an outer fixed casing. Uniform sustaining power in any direction is afforded by a spring and pivoted levers that are linked to a bridge-piece, and to meet the case of a very uneven floor a trunnion is placed in the upper socket of the floor of the radiator, whilst the pivot support is attached to the higher part of the radiator; if it desired to take out the leaf the trunnion can be moved away.

23,584.—A METHOD OF SECURING SCREWS, BRICK OR STONE WORK: W. F. Löffelhardt.—Fixing a screw into bricks or stone are devised means, the hole in the screw is inclined, the tongues, plates from which project, are inclined, the spikes for engagement respectively with the sides of the cross-bar, the screw is turned in and with the thread of the screw. A split screw socket can be produced by joining some of the plates together at their inner ends, and the outsides of the plates may be roughened; in the latter mode the tongues may be discarded.

23,590.—AN APPLIANCE FOR SHUTTING DOORS: J. Kelly and T. Kelly.—The door-plate is fashioned in one piece with a cross-bar that is laid between two cams in which are grooves that take lugs upon the cross-bar, chains join the cams to two cross-levers which are pivoted on either side of the door plate and are also linked to compound spring which are bolted on to an inner casing; the inner casing is secured within the outer casing which is fastened on to the floor.

23,611.—JOINERS' CRAMPS: H. Lawson.—A clamp devised for making door-frames, window-sashes, and similar wooden work, has four slotted arms hinged to nut-pieces at their crossing, a fitted with adjustable jaws to be closed or opened with a right and left-handed screw. The jaws will be forced towards one another for clamping a frame as the nut-pieces are moved asunder; the screw can be adjusted upon its bar-support a thumb-nuts serve to adjust the jaws upon the frame.

23,612.—FLUSHING APPARATUS: L. H. Lloyd.—By this contrivance the water is collected in a hole or receiver to which is attached a discharge valve that is worked by the hand, the customary tipping tank not being employed, or a float will serve as an automatic working of the valve. An opening provided for a direct discharge of over-flow water into the basin.

23,616.—WINDOW SASHES: A. McKinnon.—Cords passed around pulleys in order that they may balance one another join the sashes together. In the window head are made in a movable form, and for purposes of pulling down the upper sash without opening the lower one the inventor secures one end of the cord to a pierced sliding-bar, which a spring bolt keeps in its position; when that bolt is drawn backwards the tension upon the cord is maintained with a spring on the sliding-bar. Recesses in the frame take the parting beads, which can be moved outwards, when they are lowered, with fixed ends or pins, whilst the inside beads can be detached, the head orintel being hinged that it may be turned out of the way. Rods which carry the pulleys, passed through their pivoted plates into segments guide-slots cut in fixed plates; the rods remain horizontal under normal conditions, but when a wish to turn the sashes the rods are to be tilted with a wire or rod and crank. Modified form of the invention is specified.

23,623.—FLY COCKS: C. Meyer.—For a rod with a lifting motion a screwed collar is fitted on to the plug, and a nut fastens the handle of the cock on to the collar which operates within the body of the valve; the opening of the valve by turning of the handle raises the plug off its seat and the plug is again depressed as the valve is closed.

23,663.—ALTERNATING-CURRENT MOTORS: Burke.—An iron core which has notches constituting an armature for induction motors, a series of independent closed circuit conducting elements (each embracing teeth) being inserted in the notches.

23,667.—PROCESS OF MOULDING BRICKS: E. St. Hubert.—The hopper from which the material fed to the moulds is fitted with a cut-off slide (which is worked by a handle) and a feeding screw stampers. Three horizontal discs cast in one with a cylindrical casing constitute the rotating mould table, which is carried between guide rollers, and is driven with bevel wheels or gears. The pressing plungers are carried on vertical rods which have roller guides and friction rollers running upon a fixed cam ring. Fixed rods which act through horizontal sliding rods, shut close the hinged lids of the moulds. An end chain and bevel gearing from the driving shaft work the feeding screw.

23,689.—A METHOD OF DRYING BRICKS: L. Neffens.—The bricks, tiles, &c., are laid upon perforated floor of a drying chamber, underneath which are the heating pipes. An insulating space formed in the roof, and the carrying gable stone brick has a central cavity for the insulating material together with a pierced projection for the heated air. For a saddle-shaped roof the stone or brick is made with two pierced projections.

23,732.—A CUT-OFF FOR GAS VALVES: J. M. Arnold.—An automatic cut-off valve in the plug-cock. The inventors fit a hollow plug-cock in the valve; and a cut-off valve in the plug-cock. A spring presses from above upon the cut-off valve, which

stained by a rod that has its cap embedded in the fusible composition placed within the top...

23,753.—ELECTRICITY CURRENT METERS: E. C. ... A maximum current indicator comes a method of registering the highest pressure...

23,774.—BRICKS FOR THE FLOORS OF KILNS: ... The inventors fashion nequr bricks for the floors of kilns with side ribs...

MEETINGS.

FRIDAY, MARCH 29. Architectural Association.—Mr. H. D. Seales-Wood...

SATURDAY, MARCH 30. Architectural Association.—Spring Visit to the new buildings of the Prudential Assurance Company...

MONDAY, APRIL 1. Royal Institute of British Architects.—(1) Election of candidates for membership...

TUESDAY, APRIL 2. Institution of Civil Engineers.—Mr. E. Sandeman on "The Burrator Works for the Water Supply of Plymouth..."

WEDNESDAY, APRIL 3. Royal Archaeological Institute.—(1) Mr. W. H. St. John Hope on "The Guelbertine Priory of Watton, Yorkshire..."

THURSDAY, APRIL 4. Civil and Mechanical Engineers' Society.—Mr. A. Janssen on "The Proportions of Cylinders for Multiple Expansion Engines..."

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Leuchie and Clackmannau Towers.

RECENT SALES OF PROPERTY:

Table listing estate exchange reports for March 14, including properties like Holbeach Marsh, Stamford Hill, and various other estates with their respective values.

Main table of property listings with columns for location, area, and price. Includes entries for Barnsbury, Old Ford, Hatfield, and many other areas.

Table of property listings with columns for location, area, and price. Includes entries for Barnsbury, Old Ford, Hatfield, and many other areas.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for various materials such as Bricks, Hard Stocks, Rough Stocks, and various types of bricks and tiles.

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Fire Station	Manchester Corporation	300l., 200l. and 100l.	June 24
*Shops and Houses, Parkgate	Darlington Corporation	Not stated.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Mortuary Chapel and House, North Bierley	Bradford Corporation	A. Sharp, Architect, Market-street, Bradford	April do.
Bandstand, Peel Park	do.	F. E. P. Edwards, Architect, Chapel-lane, Bradford	do.
Alterations, &c., to Three Warehouses	do.	do.	do.
Cottage, &c., Chapeltown	Wortley R.D.C.	O. E. Beaumont, Engineer, Workhouse, Grenoside, nr. Sheffield	do.
Additions to Mill, Hanley, Staffs.	Messrs. C. Leese & Sons	R. Scriveners & Sons, Architects, Hanley	do.
Additions to Warehouse, Ormeau-avenue, Belfast.	Alvaston (near Derby) U.D.C.	Young & Mackenzie, Archts., Scotland Provident Bldgs., Belfast	do.
Sewers, &c.	Coventry Corporation	W. H. Linton, Civil Engineer, King-street, Nottingham	do.
Additions to Farm Buildings, Rothliebriabane, N.B.	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Restoration of St. Mary's Hall	Soothill Nether U.D.C.	J. Chadwick, Architect, Earlsheaton	do.
Council Room, &c., Earlsheaton	Bradwell (Bucks) School Board	W. H. Linton, Civil Engineer, Bletchley, Bucks	do.
School Buildings, &c.	Whitton (Wilts) Guardians	Howdill & Howdill, Architects, 7, Oxford-row, Leeds	do.
Additions to Chapel and Classrooms, Bramley, Leeds	Barnsley Corporation	J. Harding & Son, Architects, 58, High-street, Salisbury	do.
Additions to Workhouse Infirmary	Mountain Ash U.D.C.	T. & C. Hawksley, C.E., 39, Great George-street, Westminster	do.
Laying Cast-iron Pipes (2 miles)	Linnelly (Brecon) School Board	H. P. Linton, Town Hall, Mountain Ash	do.
Retort House, &c., at Gasworks	Scarborough R.D.C.	J. Thomas, Brynmawr, Brecon	do.
Additions to Schools, near Brynmawr	St. Albans City Council	W. O. Woodall, 32, Queen-street, Scarborough	do.
Reservoir, &c., East and West Aylton	Rev. J. L. Jones	Beesley & Co., Engineers, 11, Victoria-street, Westminister	do.
Sewage Disposal Works	Windsor Town Council	O. P. Davies, Architect, Alma-road, Windsor	do.
House and Shop, Glyncoerwg, Port Talbot	Yorks (Northants) U.D.C.	T. Yorke, Surveyor, Raunds	April do.
Re-roofing Police Station	Hollingbourne (Kent) R.D.C.	H. J. Bracher, 33, Earl-street, Maidstone	do.
Road Materials	Mr. L. Burrell	S. Dyer, Architect, Bridlington	do.
Stone, &c.	Newport (Salop) U.D.C.	W. Wyatt, Engineer, 99, Radford-road, Leamington	do.
Additions to No. 12, Promenade, Bridlington	Olamorgan County Council	M. Hall, Architect, 29, Northgate, Halifax	do.
Sewerage Works	do.	W. E. R. Allen, County Council Offices, Cardiff	do.
Seven Houses, Albert-road, Halifax	Standing Joint Committee	do.	do.
Weights and Measures Buildings, Port Talbot	Todmorden Corporation	C. R. Pease, Engineer, Town Hall, Todmorden	do.
Additions to Police Station, Port Talbot	Wrexham R.D.C.	R. Evans, Surveyor, Johnstown, Rusbon	do.
Additions, &c., to Police Station, Caerphilly	Messrs. P. & J. Buchan	W. Reid, Architect, Saltoun-square, Fraserburgh	do.
Sewage Works, &c.	Eastbourne Corporation	J. E. Brydges, Civil Engineer, Electricity Works, Eastbourne	do.
Culvert, &c., Eyton	Warrington Corporation	Strachan & Son, 20, Belmont-street, Aberdeen	do.
Houses, Albert-street, Fraserburgh, S. B.	Coleraine U.D.C.	T. Longdin, Engineer, Town Hall, Warrington	April do.
Brick, &c., Transformer Chambers	Messrs. E. Field & Sons	Town Surveyor, Town Hall, Coleraine	do.
Additions, &c., to House, Cairnton, Finlira, N.B.	Bradford Prov. Lunatic Soc., Ltd.	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Wood Block Flooring Works, Aldin-street	Easingwold (Yorks) R.D.C.	Bycroft & Firth, Architects, Mauchester-road, Bradford	do.
Alterations to Town Hall	do.	Fairbank & Son, Civil Engineers, 13, Lendal, York	do.
Eleven Houses, Skelmanthorpe, Yorks	do.	Rev. W. W. Grigg, Norfolk-street, Boston	do.
Additions to Church Mause, Hiptree Heath, Essex	Penyfont (Wales) R.D.C.	G. E. Halliday, Architect, Cardiff	April do.
Additions to Bakery, Dudley Hill	Mr. J. D. Williams	J. Hurley & Son, Engineers, 10, Bridgend-road, Aberkneig	do.
Water Supply Works	Lossiemouth Town Council	Jackson & Fox, Architects, 7, Rawson-street, Halifax	do.
Water Mains, &c.	Loughou U.D.C.	Grithns & Jones, Architects, Tonypandy	do.
Wesleyan Chapel, Frampton, Lincs	Burnley Corporation	J. Wittel, Burgh Surveyor, 51, High-street, Elgin	April do.
Church Works, St. Teilo, Cardiff	Warwick Town Council	See Advertisement	do.
Water Supply Works	Abergavenny R.D.C.	Borough Surveyor, Town Hall, Burnley	do.
Two Shops and Houses, King's Cross, Halifax	Daventry R.D.C.	E. M. Richards, Civil Engineer, 29, The Butts, Warwick	do.
Additions to White Hart Hotel, &c., Tonypandy	Bromley U.D.C.	J. H. Farquhar, Council Offices, Abergavenny	do.
Drainage Works	Barnstaple R.D.C.	J. B. Williams, Engineer, Moot Hall, Daventry	do.
Sewerage Works	Kingston-on-Thames Corporation	Council's Offices, Bromley, Kent	April do.
*Road Materials	Madeira Estate Freeholders	Beesley & Co., Engineers, 11, Victoria-street, Westminster	do.
Water Supply Works	Wilkesden District Council	Byfield & Son, 3, Stone-buildings, Lincoln's Inn	do.
*Chimney Shafts	Bromley U.D.C.	Engineer, Public Offices, Dyne-road, Kilburn, N. W.	do.
*Road Making, &c., Works	Brighton Borough Council	Council Offices, Bromley	April do.
*Coal, Coke, &c.	Sutton Bridge (Lincs) U.D.C.	Surveyor, Town Hall, Brighton	do.
*Concrete Groynes	Ystradydodwg School Board	J. P. Davies, Eureka-place, Ebbw Vale	April do.
Fourty Houses, Ebbw Vale	Harrow United District School Bd	L. C. Harvey, Hobeach	do.
Granite, &c.	Wils County Lunatic Asylum	J. Rees, Architect, Pentre	April do.
Schools	Woolwich Borough Council	Houston & Houston, Architects, 5, York-buildings, Adelphi, W.C.	do.
*Laundry	Blackburn Corporation	F. Sumner, Maxey-road, Plumstead	April do.
*Water Vans	Lancaster Building Club	W. Stnbs, Civil Engineer, Town Hall, Blackburn	do.
Sewage Conduits	H.M. Office of Works	County Offices, Trowbridge	April do.
Sixteen Pairs of Cottages, Penydarren Park, Merthyr	Ifracombe U.D.C.	Office of Works, Storey's Gate, S.W.	do.
*War Office, Whitehall	Wolverhampton School Board	Town Hall, Ifracombe	do.
*Sewers, &c.	Long Eaton Co-operative Soc., Ltd	T. H. Fleming, Architect, 102, Darlington-st., Wolverhampton	do.
*Heating and Electric Lighting	Keesteven County Asylum Visitors	E. R. Ridgway, Architect, Long Eaton	do.
Alterations to Store Premises	Stapleford Co-operative Soc., Ltd	T. H. Holden, Sleaford	do.
Roads at Asylum, Quarrington, Lincs	Warrington Town Council	F. E. Spring, St. Anne's-on-Sea	do.
Veranda near Public Hall, St. Anne's-on-Sea	do.	E. R. Ridgway, Architect, Long Eaton	do.
Seven Cottages, &c., Pasture Gate	do.	Cackett & Burns Dick, Architects, 24, Granger-street, Newcastle	do.
Wood Flooring at Police Station	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applic to be delivered
*Engineering Clerk of Works	Bristol County Council	5l. 6s. per week	Apr. do.
*Architectural Assistant	Bournemouth Corporation	160l. per annum	Apr. do.
*Engineering Assistant	Sheffield Corporation	250l. per annum	Apr. do.
*Chief Highway Surveyor	Nottingham Corporation	250l. per annum	Apr. do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxii.

PRICES CURRENT (Continued).

STONE.
a. d.
aster in blocks ... 2 0 per ft. cube, deld. rly. dep't.

SLATES.
in. s. d.
to best blue Bangor ... 11 5 0 per 1000 of 1200 at rly. dep.

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TO CORRESPONDENTS.

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

TENDERS.
CARDIFF.—For the erection of new warehouse, Para-
diso-place, for Mr. Joseph Spiridon. Messrs. Venn &
Sant, architects, Cardiff.

FRINTON-ON-SEA (Essex).—For making-up and
sewering portions of Second-avenue, Third-avenue,
Ashlyn-road, and Holland-road, Frinton-on-Sea, for Mr.

HASTINGS.—For the supply of 3,000 tons Guinness'
granite for the Corporation. Mr. P. H. Palmer, C.E.'s,
Town Hall, Hastings.

LONDON.—For the erection of a house, Aldrington-
road, Streatham. Mr. William H. Bart, architect, 10,
Bush-lane, E.C.:

LONDON.—For printing works, Tottenham, for
Messrs. J. M. Kronheim & Co., Mr. Ernest H. Abbott,
architect, 6, Warwick-court, Gray's Inn, W.C.

LONDON.—For the erection of Sheriffan, Beaumont,
and Fletcher buildings, Duke's-court site, Drury-lane, for
the accommodation of persons of the working classes to
be displaced by the Clear Market, Strand, scheme, for the
London County Council:

LONDON.—For proposed rebuilding of Nos. 39, 40,
and 41, Trinity-square, for the executors of the late C. J.
Knowles, from drawings prepared by Mr. C. Watkins, of
Glebe House, Sberborne-lane, E.C., exclusive of fixtures
and fittings. (Quantities by Mr. Deacon:—

James Allan ... £1,878 19 6
C. C. Dunn ... 1,875 0 0
Evans & Bros. ... 1,853 0 0
W. T. Morgan ... 1,850 0 0
J. Thomas ... 1,845 0 0
Price Bros. ... 1,798 0 0
Handford &
Hawthornthwaite ... 1,774 0 0
Elsworth ... 1,771 15 7
Couzens & Co. ... 1,768 0 0
Knox & Wells ... 1,760 0 0
Melhuish Bros. ... 1,715 0 0
T. Mags ... 1,630 0 0

F. W. Anderson ... £6,015 0 0
H. J. Linnell ... 6,538 9 0
Mackenzie &
Sons ... 6,166 12 8
Burgoyne &
Sons ... 5,971 14 7
E. West ... 5,971 14 7

Farman & Fother
... £4,754 0
Lorden & Sons ... 2,719 15
Bulled & Co. ... 2,689 0

A. E. Symes ... £5,640
R. & E. Evans ... 5,550
G. Maddison ... 5,499

Holloway
... £25,470 0 0
Foster & Dicksee ... 25,216
W. Downes ... 25,143
Greenwood ... 25,374

H. Lovatt ... £26,250
Colis & Son ... 25,860
Foster & Dicksee ... 25,216
W. Downes ... 25,143
Greenwood ... 25,374

LONDON.—For the extension of the middle-level
sewer to Scrubs-lane, Hammersmith, and for the con-
struction of a sewer along Scrubs-lane from the county
boundary to Waldo-road, as well as a length of sewer
under the existing ditch forming the overflow from the
Counter-creed sewer, for the London County Council:—

LOWESTOFT.—For the erection of the boys' home in connexion with the shipping agency at Lowestoft, for the Industrial and Reformatory Schools Committee of the London County Council:—
 Martin Wells & Co. £4,595
 J. Cracknell 4,654
 C. R. Cole 4,640
 A. & B. Hanson 4,634

PETERBOROUGH.—For the erection of shops, &c., also subway, at Cowgate and King's-street, for Mr. C. F. Thomson, Mr. J. G. Stallebrass, architect, North-street, Peterborough:—

	Shops.	Subway.
Thurley Bros.	£4,380 0 0	£225 0 0
J. Woolsten.	4,340 0 0	201 0 0
R. Shanks.	4,150 0 0	399 0 0
C. F. Collis.	3,998 0 0	221 0 0
Bridgefoot & Son.	3,922 13 1	219 0 0
J. Cuttridge.	3,779 0 0	270 0 0
Hipwell & Co.	3,600 0 0	291 0 0
J. Lucas.	3,598 0 0	250 0 0
J. Cracknell.	3,564 0 0	238 0 0
R. J. Nichols.	3,538 14 0	258 16 6
F. H. Nichols.	3,527 13 0	215 3 6
D. Gray.	3,431 9 0	205 0 0
H. Watson, Peterborough.	2,997 0 0	215 0 0

Correction—Messrs. Gavin Bros., Wilson-street, First-bury-square, call our attention to an error in the spelling of their name in our last issue in the tender for Brecknock-road job. The name was printed Lavin Bros. The mistake was due to illegible "copy."

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

** Recommended for acceptance.*

CANAL-ROAD (Improvements).—Providing and fixing complete low-pressure hot-water apparatus:—

Wippell Bros. & Co., Ltd.	£642 0 0
Row.	£830 0 0
Cannon & Sons.	789 0 0
Dargue, Griffiths, & Co., Ltd.	679 10 0
J. Esson.	675 0 0

DANIEL STREET.—Special school of four rooms, twenty each, total 80; water-closets for boys and girls, and a coal store; altering position of entrance to manual centre:—

Chesson & Sons.	£3,957 13 2
Treasure & Son.	3,738 0 0
Clarke & Bracey.	3,711 0 0
Leslie & Co., Ltd.	3,626 6 1
Wall & Co.	3,621 0 0
Crover & Son.	3,595 0 0
McCormick & Sons.	3,535 0 0

HEAD OFFICES.—Building a new story over ante-room, &c., in order to provide a new drawing office for architect's department:—

E. Triggs.	£2,960 0 0
Lathey Bros.	2,949 0 0
Holloway Bros.	2,720 0 0
Wall & Co.	2,630 0 0
F. & H. F. Higgs.	2,614 0 0
F. G. Minter.	2,638 0 0

C. B. N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

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EDINBURGH-ROAD SCHOOL (Improvements).—Providing new hall, about 44 ft. by 28 ft., for each department; new staircase for girls; infant teachers' room; extending and re-dividing two existing classrooms into three rooms of 50, 48, and 42 in all departments, reseating one room on each floor; removing girls' and infants' and boys' covered playgrounds and providing new playground for boys. Revised accommodation:—Boys, 374; girls, 374; infants, 435; total, 1,183. Net loss of 18 places:—
 King & Son. £9,517 0 0
 Simpson & Son. 9,280 0 0
 J. & M. Patriek. 9,051 0 0
 Treasure & Son. 8,933 0 0
 Martin, Wells, & Co. 8,924 0 0
 Lorden & Son. 8,852 0 0

HOLBEACH-ROAD.—Providing and fixing complete low-pressure hot-water apparatus to three halls, fifteen class-rooms (ground, first and second floors), drawing classroom, cloakrooms, corridors, and lavatories:—
 Hartlow & Son. £777 0 0
 J. Esson. 725 0 0
 Dargue, Griffiths, & Co., Ltd. 708 0 0
 Vaughan & Brown, Ltd. 708 0 0
 Cannon & Sons. 698 0 0
 Knight & Sons. 598 0 0
 Wenham & Waters, Ltd. 566 0 0

HOLLYDALE-ROAD (Boys).—Removing old troughs, extending the offices and building new front wall, rebuilding the back wall, refitting offices with separate pans, and providing new drains with connexion to the existing inspection chamber:—
 Baylis & Francis. £498 0 0
 W. V. Goad. 351 0 0
 Johnson & Co. 364 0 0
 H. Groves. 345 0 0

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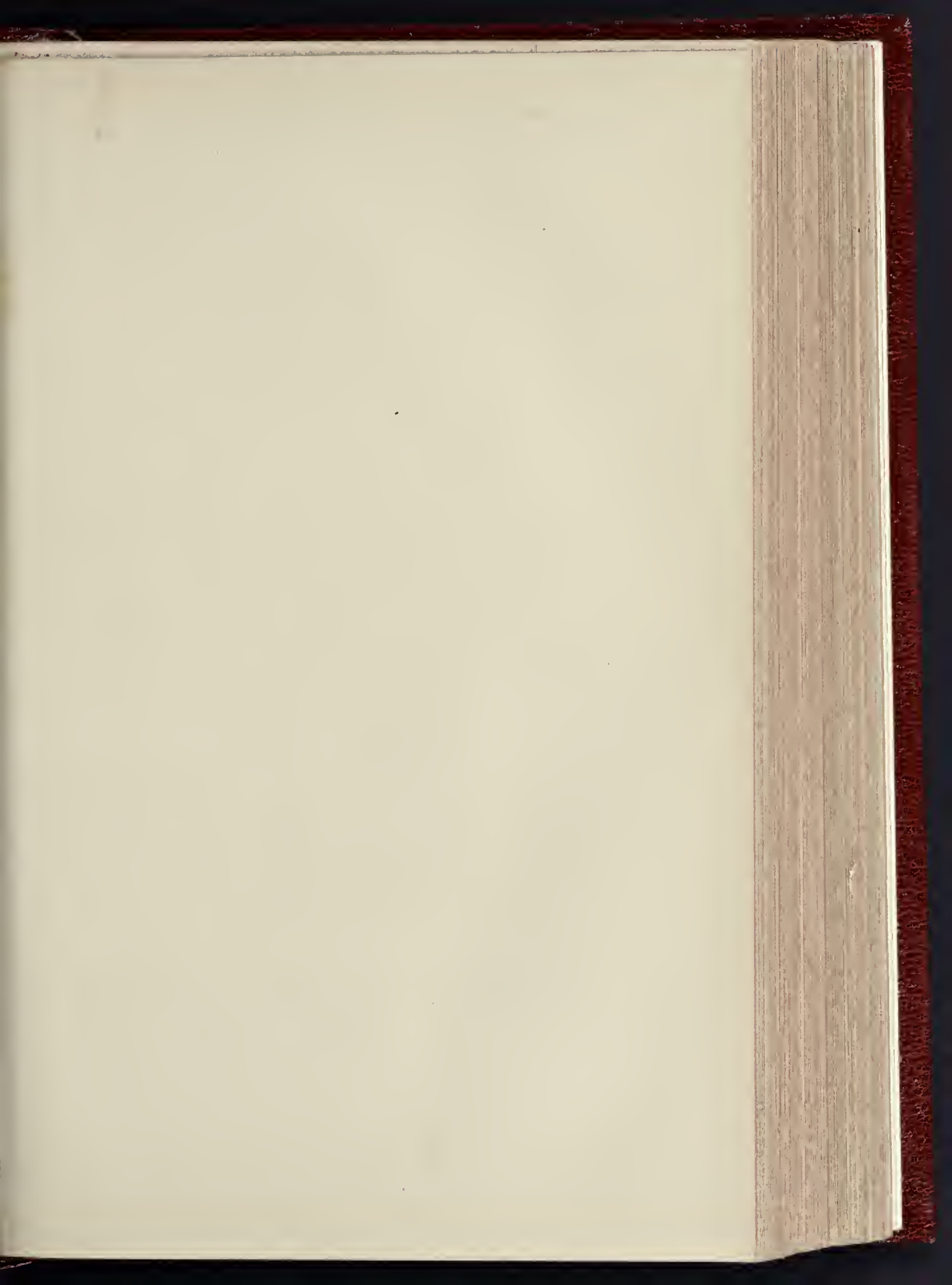
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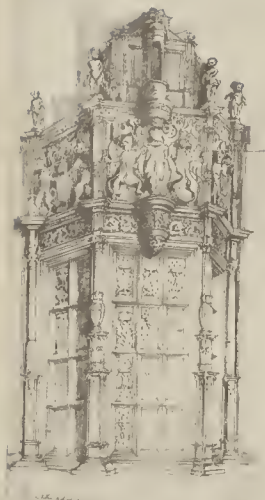
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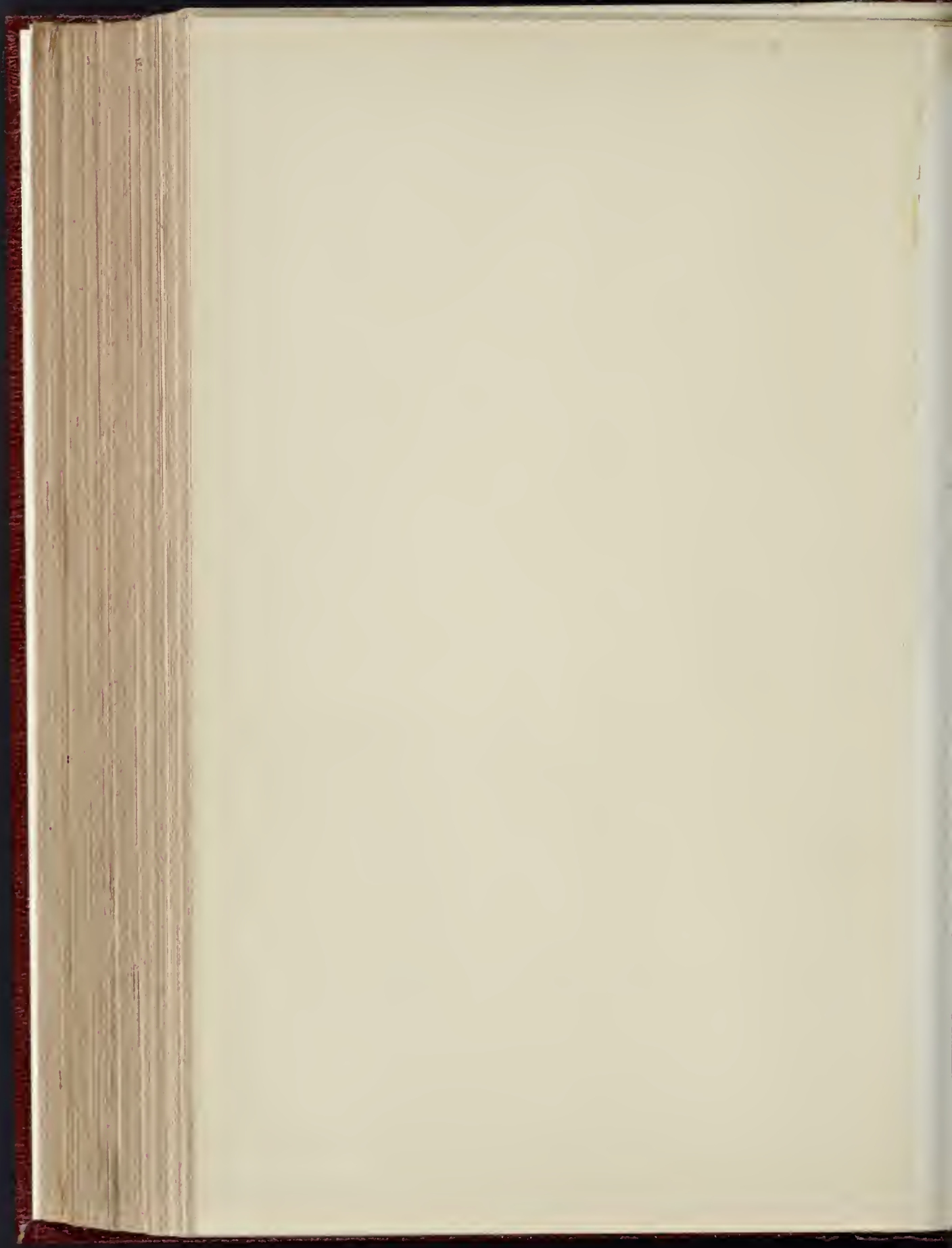


HALF ELEVATION.

ELEVATION OF ANGLE.



PHOTOGRAPHED BY G. S. EASTMAN CO. 1901. 11. 17. 1901



The Builder.

VOL. LXXX.—No. 3935.

APRIL 6, 1901.

ILLUSTRATIONS.

Illustrations of the Glasgow Exhibition Buildings.—From Sketches by Mr. A. McGibbon	Extra Large-Page Photo-Litho.
Small Suburban Houses (Illustrations to Mr. Searles-Wood's Paper at the Architectural Association)	Two Double-Page Photo-Lithos.
Country Church.—Mr. C. V. Johnson, Architect	Single-Page Photo-Litho.
Design for Emmanuel Church, Exeter.—By Mr. C. V. Johnson	Single-Page Photo-Litho.

Blocks in Text.

Glasgow International Exhibition; Machinery Hall	Page 334	A Small Suburban House	Page 342
Diagrams Illustrating Laxer Prisms, and Prismatic Lighting Theory and Application	Pages 337-340	Sketch for Cottage Residence at Stratford-upon-Avon	" 343
Design for Emmanuel Church, St. Thomas, Exeter; Plan		A Country Church: Plan	" 34
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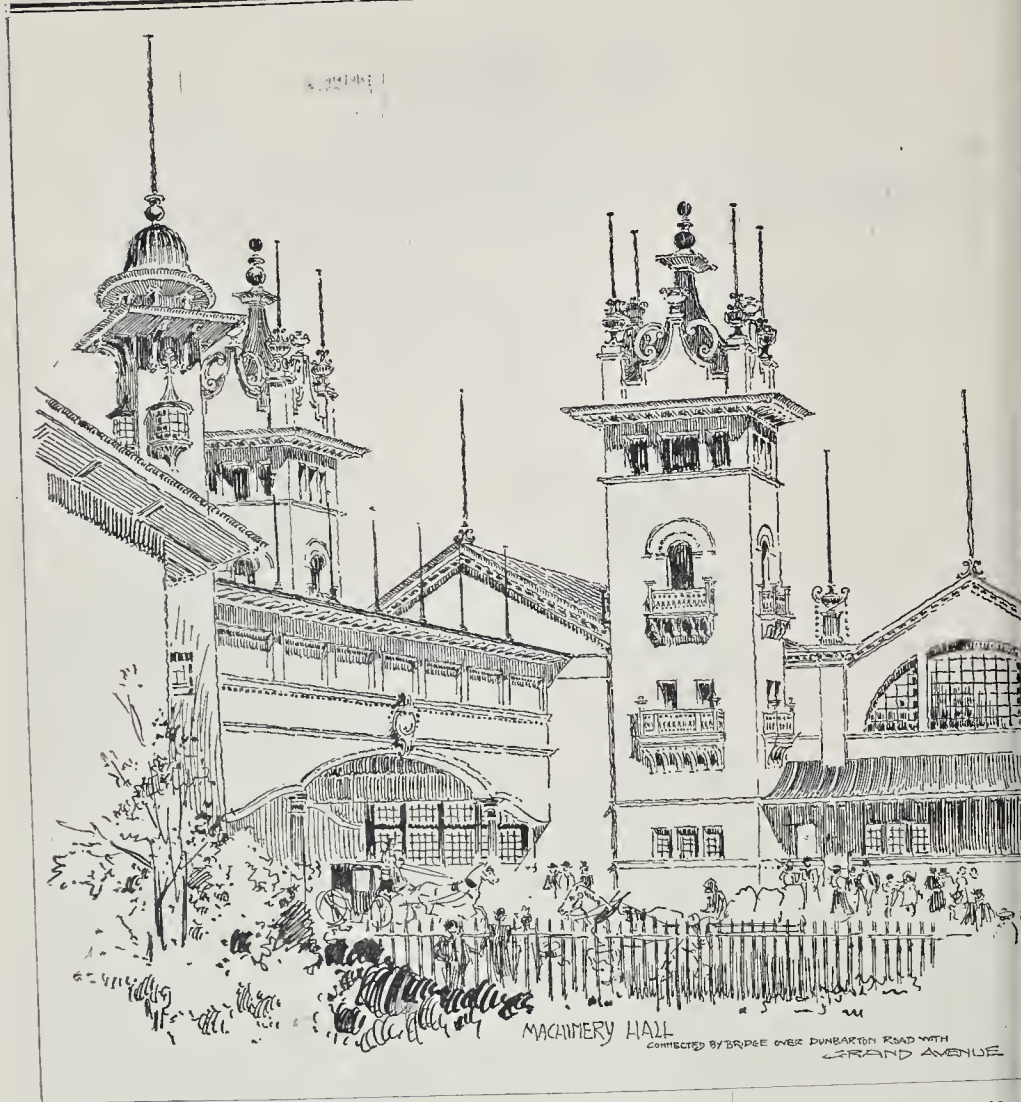
Glasgow International Exhibition.



WHATEVER may be urged against the frequency of great international exhibitions, the success of Glasgow's former venture of 1888 seems sufficient warrant for her Exhibition of 1901. The circumstances are very different from those obtaining then, and the position of the centre-piece in the present year is an Art Gallery, whose origin was a handsome surplus yielded by the former formation, is an encouragement, almost an assurance, of something more than a summer and the temporary fillip to local trade the record of this second effort. The site is the previous one in Kelvin Park, but more ground has been secured. Across Dumbarton-road, which its boundary, is placed the machinery reached by a bridge; and this, with the central hall and the concert hall, all apart, are two large restaurants, constitute temporary buildings of the Exhibition. The art gallery, designed by Messrs. Mackenzie and Allen, occupies a central position connected by covered passage with the main avenue, but otherwise it is decorated by any temporary decoration. Its structure is in red sandstone, but no attempt has been made in the surroundings to echo any of its features; rather they serve as a foil, in their colour and character, to emphasise its presence. The Exhibition buildings proper are mainly dealing here. Though they are unavoidably disconnected, it must be noted that something more might have been done by way of symmetrical alignment, not only with the gallery, but with the approaches, the river, and its bridges. The lines of walks and buildings seldom meet, and this is only too obvious from the points of view which afford a panorama of the

whole grounds. The general aspect of the buildings is one of brightness and gaiety. Excepting the domes and roofs, gilt-tiled or painted, all is of plaster left white. This system (following the lead of recent exhibitions) has much to commend it in preference to painted wood boarding. The present is by far the largest use made in this country of this material, and it is not unlikely that this may lead to its employment, with some modification, for more permanent and yet light structures. It is applied to the framing of the buildings in large plates, for ease in handling kept to about 5 ft. by 3 ft. 6 in., though this size is often increased. The plates are formed by slight stretchers of wood, with additional strips as required, laid on a metal table; plaster is then poured on and a sheet of thin sacking embedded; more plaster is added and a return ply of the canvas pressed in if required for stronger work, and in a few minutes the plate can be nailed into position, and bear very considerable vibration without fracture. The joints require, of course, to be filled up with plaster, and at the same time a thin finishing coat is applied over the whole surface, which is finally painted. How far paint will form a protection from frost and weather to ordinary stucco this present experiment can only help to show. The upper surfaces of the cornices, it should be said, are of felt. This use of plaster lends itself admirably to modelled work, not fashioned *in situ* but done in pieces just as the other, and this quality has been fully taken advantage of. Throughout the spirited ornament and especially the modelled figures of Mr. Albert Hodge will be noted and admired. The architectural style chosen is Renaissance of a Spanish type; only here and there is seen a slight breaking away from historical precedent, in one case taking the form of Italian Gothic, and elsewhere that of the very latest German "arts and crafts" decoration. Of course, it may be urged that an extraordinary requirement should have been met by a treatment other than that associated with enduring structures;

but the illogicality of columns and cornices in hollow plaster simulating stone is not much greater than that of the stereotyped features of the entablature derived from a wooden prototype, and allowance must be made for a popular delight—not necessarily vulgar—in a scenic display of architectural forms beautiful in themselves, and suggestive to many of more than meets the eye. Mr. Miller's effort is the group of dome and tower, forming the centre-piece of the industrial hall. The dome shows a little more than the half-sphere, rising from a square plateau, at the corners of which are towers, but so far from the dome as to require low cupolas to fill up the diagonal space, the resulting group is therefore of considerable intricacy and richness. The dome is of sufficient exterior bulk, and, as it has no inner shell, just high enough for interior effect. The cupolas, and the open belvedere between the towers form a tea room, reached by elevators, thus usefully taking advantage of a fine position for outlook. One may regret that so much elaboration has been concentrated on this part of the erection, to be demolished after six months' use with the rest, but the first intention was that the dome should be retained as a winter palace when the surrounding buildings were cleared away. This idea, however, has been abandoned, and properly so, for so large an erection would encumber the park, and its near proximity to the Art Gallery would be a disadvantage to both. In front of the dome, towards the river, is a piazza—a costly feature in respect of the lettable floor space sacrificed to it, but one which amply justifies itself as a dignified architectural adjunct. Its side to the river is an open colonnade, with a great archway: all constructed decoration, but more than defensible. As effective as any part of the whole design is the wall-face extending between the eight pavilions that mark the corners of the two squares into which the industrial hall is divided by the dome and piazza. It is in stretches of a dozen bays or so of arched windows between pilasters; beneath is a perfectly plain story; above, a



cornice and pierced parapet, all very well illustrating the value of repetition of parts. The pavilions have red-tiled roofs, greatly projecting eaves, and semi-spherical domes, felt-covered, and painted green like copper. The great dome is entirely gilt. It is in these pavilions that the anachronisms in style referred to appear, the great coved cornice resting on nondescript pilasters, which are altogether out of scale, being much too large. The arched cove has an outward bulge, and this feature is repeated with exaggeration at the great entrance from the piazza.

There is much variety of design in the many towers. Those at the ends of the Great Avenue are square, rising to an open belvedere, with a circular centre tower rising higher. Slight vagaries in style here are the vaulted covering above and the heads themselves of the window lights, which are of ogee shape with Gothic-esque labels. Other smaller towers are circular, some tapered; all have covered roofs; all have far projecting shelf-like eaves that

with their white undersides light up very well.

The machinery hall has only one frontage, that to Dumbarton-road, consisting of a central gable and two lesser ones on either side. Twin towers flank the centre, where the covered way bridges the road and connects by the Grand Avenue with the rest of the Exhibition.

The concert hall is a rotunda, and accommodates over 4,000 persons. A balcony extends the depth of a circular aisle, and the roof is a saucer-dome (externally felt, painted green) with an eye for light. There is no break in the circle for an organ recess, the face of the instrument lining with the columns that form the aisle. There is a square annexe for the entrance, with a central and two side staircase towers. Here occur some Italian Gothic tracery and Venetian trefoiled battlements; but the imported features are quite in scale. At the opposite diameter is a large restaurant, in its great extent an afterthought of the Executive, which quite inexcusably involved

the demolition of an interesting old Kelvingrove House, against the protest of the Glasgow Architectural and Archaeological Societies and all citizens of taste. The restaurant will be removed with the concert hall; its metal construction does not permit of this, but it remains to be seen if its fragile wallings will stand.

Regarding the materials of construction, change was made during the progress of the works, wood largely taking the place of iron, because of difficulty in getting the latter. Only the centre aisle roof, the industrial and machinery halls, the concert hall and the concert hall are of metal. The principals are made up of light iron, with various combinations, and take the form of elliptical arches; in the larger instances the foot is contracted to a pivot at the ends to permit of contraction and expansion. The other roofs are of ordinary wood. The extent of glass is about three times the floor area. The floor itself is close-boarded, less cold and more cleanly than open

ing. Laminated wood construction is only employed at the Grand Avenue, where semi-circular principals in four thickness of 1-in. "stuff" give an architectural effect more pleasing than the truss roofs.

It has been an aim to give as uninterrupted a floor space as possible, and this practical end has been attained. The fewness of roof supports is quite remarkable; but the spectacular result is most disappointing, for the actual extent cannot be grasped in the jumble of exhibits, of all shapes and sizes, through lack of division into courts. What is required is that the roof supports should be emphasised, whether as colonnade or arcade, anything to give scale and vista—a row of useless "Venetian" masts would do this—and so give the advantage to exhibits of frames to pictures of a size the eye can grasp.

This very openness of the industrial hall accentuates the solidity of the towers surrounding the dome, and the four arches between, of deep soffit. Attached to the pendentives are great modelled winged figures standing in the prows of galleys. Up to the first cornice all is plain white, above in the drum a conventional landscape is painted, interrupted by the windows that light the tearoom. Above is the range of lucarnes, and over all the unbroken hemisphere with floating figures painted on it. Under the dome is a statue of his Majesty, modelled by Mr. Hodge. This part, then, alone of the interior is treated architecturally; all around is a riot of heterogeneous exhibits. It will be gathered that the principal artistic merit of the buildings is external, and the architect, Mr. James Miller, is to be congratulated on his conception, satisfying as a composition and made interesting by clever detail.

NOTES.

The Monument to Queen Victoria
It is understood (though not officially announced) that five architects have been selected to submit designs for a structure to be erected in front of Buckingham Palace as a monument to the late Queen, viz., Mr. T. G. Jackson, Mr. Aston Webb, Mr. Ernest George, Sir Thomas Drew, and Dr. Rowand Anderson. We have no fault, of course, to find with the selection of names as far as it goes; but it is rather a limited one, and we do think that in the first instance there should be a sketch competition open to all English architects and sculptors—for the architects ought to work in conjunction with the sculptors for such a monument, as would certainly be the case in France; and we repeat that if such a structure as is apparently contemplated be set up in front of Buckingham Palace, it will make the Palace front look ridiculous. The Palace façade and the whole laying out of the adjoining site ought to be integral elements of the design; and it will be a failure if they are not made so.

The Use of Water-Gas in London.
The substitution of carburetted water-gas for coal-gas in the public gas supply in certain parts of the Metropolis is proceeding apace. The report of the Commercial Gas Company shows that during the last half-year 83,945 tons of coal were carbonised, and 1,758,190 gallons of oil were also used for gas manufacture, the total make of gas being 1,406,501,000 cubic feet. Apparently, therefore, about

40 per cent. of the total output of gas consisted of carburetted water-gas. It is evident that the recommendations of the Departmental Committee which sat in 1899 to inquire into the use of water-gas are being quietly ignored, and the nature of the gas supplied is being changed without any reference to the wishes of the consumers. We do not say that carburetted water-gas should not be supplied if it can be more cheaply manufactured; but we do say that, in view of its greater gravity and the large proportion of poisonous carbonic oxide it contains, consumers should be warned to examine the soundness of their gas-fittings, and the statutory minimum limit of gas pressure should be raised. It is not in London only that water-gas is replacing coal-gas. The recent increases in the price of coal have caused it to be introduced in most of the large towns throughout the United Kingdom.

The Sanitary Condition of Factories.

WE have said many times that, however desirable improvements in sanitary legislation may be, the first need is that Sanitary Authorities should carry out the law. If they would do this further legislation would be little required. No stronger instance of the obstructive tendency of the existing authorities can be found than the recent case of Tracey v. Pretty & Sons, which can be found in the March number of the "Law Reports." Messrs. Pretty were the owners of a corset factory at Ipswich, and the factory inspector gave notice to the Sanitary Authorities that there was a deficiency of sanitary accommodation at this factory. The authority, however, took no proceedings as they should have done, and the inspector thereupon gave notice to Messrs. Pretty, under the Factory and Workshop Acts, that they must provide proper sanitary accommodation. Again nothing was done, the owners of the factory taking no steps to remedy the defects, and thereupon proceedings were taken before the justices to recover the legal penalties for this neglect. At the hearing of the case these gentlemen decided that they could go into the merits of the case, with the result that they found the accommodation sufficient and dismissed the summons, with costs. Upon the question of fact it is sufficient to quote from the judgment of Mr. Justice Grantham:—"If it was necessary to show the reasonableness of the requirements of the inspector, and the ignorance of magistrates of the usual accommodation provided in factories, I might add that whereas one water-closet for every seventy persons was considered by the magistrates sufficient in this case, yet in London and all the principal towns in England one in twenty to one in thirty is the minimum number provided." No words could be more condemnatory of the action of the Local Authority and of the local magistrate than this judgment. When the case came before the Queen's Bench Division it was held that the justices had no jurisdiction to enter into the merits of the question, and that their decision must be quashed. This judgment, therefore, greatly strengthens the hands of factory inspectors in regard to sanitary matters, but it also shows that for the improvement of the sanitary condition of many places in England pressure upon the Local Authorities is absolutely necessary.

The Temperature of Workshops.

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cornice and pierced parapet, all very well illustrating the value of repetition of parts. The pavilions have red-tiled roofs, greatly projecting eaves, and semi-spherical domes, felt-covered, and painted green like copper. The great dome is entirely gilt. It is in these pavilions that the anachronisms in style referred to appear, the great coved cornice resting on nondescript pilasters, which are altogether out of scale, being much too large. The arched cove has an outward bulge, and this feature is repeated with exaggeration at the great entrance from the piazza.

There is much variety of design in the many towers. Those at the ends of the Great Avenue are square, rising to an open belvedere, with a circular centre tower rising higher. Slight vagaries in style here are the vaulted covering above and the heads themselves of the window lights, which are of ogee shape with Gothic-esque labels. Other smaller towers are circular, some tapered; all have covered roofs; all have far projecting shelf-like eaves that

with their white undersides light up very well.

The machinery hall has only one frontage, that to Dumbarton-road, consisting of a central gable and two lesser ones on either side. Twin towers flank the centre, where the covered way bridges the road and connects by the Grand Avenue with the rest of the Exhibition.

The concert hall is a rotunda, and accommodates over 4,000 persons. A balcony extends the depth of a circular aisle, and the roof is a saucer-dome (externally felt, painted green) with an eye for light. There is no break in the circle for an organ recess, the face of the instrument lining with the columns that form the aisle. There is a square annexe for the entrance, with a central and two side staircase towers. Here occur some Italian Gothic tracery and Venetian trefoiled battlements; but the imported features are quite in scale. At the opposite diameter is a large restaurant, in its great extent an afterthought of the Executive, which quite inexcusably involved

the demolition of an interesting old m Kelvingrove House, against the pro the Glasgow Architectural and Archae Societies and all citizens of taste restaurant will be removed with the tion, but it is intended to preserve fo the concert hall; its metal construct permit of this, but it remains to be se its fragile wallings will stand.

Regarding the materials of constru change was made during the progres works, wood largely taking the place because of difficulty in getting del the latter. Only the centre aisle roo industrial and machinery halls, th and the concert hall are of metal. principals are made up of light L various combinations, and take the elliptical arches; in the larger inst. foot is contracted to a pivot at the tion to permit of contraction and ex The other roofs are of ordinary wood. The extent of glass is about three floor area. The floor itself is close- less cold and more cleanly than opo

ing. Laminated wood construction is only employed at the Grand Avenue, where semi-circular principals in four thickness of 1-in. "stuff" give an architectural effect more pleasing than the truss roofs.

It has been an aim to give as uninterrupted a floor space as possible, and this practical end has been attained. The fewness of roof supports is quite remarkable; but the spectacular result is most disappointing, for the actual extent cannot be grasped in the jumble of exhibits, of all shapes and sizes, through lack of division into courts. What is required is that the roof supports should be emphasised, whether as colonnade or arcade, anything to give scale and vista—a row of useless "Venetian" masts would do this—and so give the advantage to exhibits of frames to pictures of a size the eye can grasp.

This very openness of the industrial hall accentuates the solidity of the towers surrounding the dome, and the four arches between, of deep soffit. Attached to the pendentives are great modelled winged figures standing in the prows of galleys. Up to the first cornice all is plain white, above in the drum a conventional landscape is painted, interrupted by the windows that light the tearoom. Above is the range of lucarnes, and over all the unbroken hemisphere with floating figures painted on it. Under the dome is a statue of his Majesty, modelled by Mr. Hodge. This part, then, alone of the interior is treated architecturally; all around is a riot of heterogeneous exhibits. It will be gathered that the principal artistic merit of the buildings is external, and the architect, Mr. James Miller, is to be congratulated on his conception, satisfying as a composition and made interesting by clever detail.

NOTES.

The Monument to Queen Victoria. It is understood (though not officially announced) that five architects have been selected to submit designs for a structure to be erected in front of Buckingham Palace as a monument to the late Queen, viz., Mr. T. G. Jackson, Mr. Aston Webb, Mr. Ernest George, Sir Thomas Drew, and Dr. Rowand Anderson. We have no fault, of course, to find with the selection of names as far as it goes; but it is rather a limited one, and we do think that in the first instance there should be a sketch competition open to all English architects and sculptors—for the architects ought to work in conjunction with the sculptors for such a monument, as would certainly be the case in France; and we repeat that if such a structure as is apparently contemplated be set up in front of Buckingham Palace, it will make the Palace front look ridiculous. The Palace façade and the whole laying out of the adjoining site ought to be integral elements of the design; and it will be a failure if they are not made so.

The Use of Water-Gas in London. THE substitution of carburetted water-gas for coal-gas in the public gas supply in certain parts of the Metropolis is proceeding apace. The report of the Commercial Gas Company shows that during the last half-year 83,945 tons of coal were carbonised, and 1,758,190 gallons of oil were also used for gas manufacture, the total make of gas being 1,406,501,000 cubic feet. Apparently, therefore, about

40 per cent. of the total output of gas consisted of carburetted water-gas. It is evident that the recommendations of the Departmental Committee which sat in 1899 to inquire into the use of water-gas are being quietly ignored, and the nature of the gas supplied is being changed without any reference to the wishes of the consumers. We do not say that carburetted water-gas should not be supplied if it can be more cheaply manufactured; but we do say that, in view of its greater gravity and the large proportion of poisonous carbonic oxide it contains, consumers should be warned to examine the soundness of their gas-fittings, and the statutory minimum limit of gas pressure should be raised. It is not in London only that water-gas is replacing coal-gas. The recent increases in the price of coal have caused it to be introduced in most of the large towns throughout the United Kingdom.

The Sanitary Condition of Factories. WE have said many times that, however desirable improvements in sanitary legislation may be, the first need is that Sanitary Authorities should carry out the law. If they would do this further legislation would be little required. No stronger instance of the obstructive tendency of the existing authorities can be found than the recent case of Tracey v. Pretty & Sons, which can be found in the March number of the "Law Reports." Messrs. Pretty were the owners of a corset factory at Ipswich, and the factory inspector gave notice to the Sanitary Authorities that there was a deficiency of sanitary accommodation at this factory. The authority, however, took no proceedings as they should have done, and the inspector thereupon gave notice to Messrs. Pretty, under the Factory and Workshop Acts, that they must provide proper sanitary accommodation. Again nothing was done, the owners of the factory taking no steps to remedy the defects, and thereupon proceedings were taken before the justices to recover the legal penalties for this neglect. At the hearing of the case these gentlemen decided that they could go into the merits of the case, with the result that they found the accommodation sufficient and dismissed the summons, with costs. Upon the question of fact it is sufficient to quote from the judgment of Mr. Justice Grantham:—"If it was necessary to show the reasonableness of the requirements of the inspector, and the ignorance of magistrates of the usual accommodation provided in factories, I might add that whereas one water-closet for every seventy persons was considered by the magistrates sufficient in this case, yet in London and all the principal towns in England one in twenty to one in thirty is the minimum number provided." No words could be more condemnatory of the action of the Local Authority and of the local magistrate than this judgment. When the case came before the Queen's Bench Division it was held that the justices had no jurisdiction to enter into the merits of the question, and that their decision must be quashed. This judgment, therefore, greatly strengthens the hands of factory inspectors in regard to sanitary matters, but it also shows that for the improvement of the sanitary condition of many places in England pressure upon the Local Authorities is absolutely necessary.

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such a case the Coventry authorities ought to call in the assistance of an architect acquainted with Gothic architecture, and not leave the treatment of the building to an engineer.

The Poultry Cross, Salisbury. THIS well-known monument, a conspicuous object in the quiet streets of Salisbury, seems to be threatened with the same kind of treatment as St. Mary's Hall at Coventry, mentioned above: It is to be repaired, under the direction of the City Engineer, at the hands of a local firm of "monumental masons and sculptors," who execute "all kinds of memorials in granite, marble, or stone." It is moreover to be treated with "fluat" to prevent its further decay; an operation which must be preceded by the removal of all lichens, &c.; in short, the older portions must be scoured to a raw new surface. It is gratifying to find that a protest was raised by a member of the Town Council (Mr. Pye-Smith) against any attempt at a wholesale restoration, or anything beyond making good the decayed portions; and an amendment to this effect was carried, but only by the Mayor's casting vote. The Cross, it is true, was so much restored fifty years ago that much of its archaeological value is gone; but it still retains some of the ancient work, and such a monument ought not to be left to be dealt with by an engineer and a firm of masons. The Council have at their very doors a most competent archaeological architect, Mr. Doran Webb, of Salisbury; why do they not consult him?

St. Paul's Church, Ball's Pond. THE Ecclesiastical Commissioners have agreed, it is stated, to contribute 500*l.*, and an appeal is made for further subscriptions, towards the proposed reparation and improvement of this church. The sum required is estimated at 2,500*l.* The alterations include the restoration of the outer stone and brick work, an enlargement of the choir vestry, the decoration of the interior, repairs of the organ (by Russell, 1828, improved by Willis, and enlarged by Robson, 1875), a new choir, &c. The district church of St. Paul, standing at the junction of Essex and St. Paul's roads, was built in 1826-8 after Sir Charles Barry's plans and designs, in pursuance of what is known as the "Million" Act of 1818, 58 Geo. III., cap. 45. Under a subsequent Act of 2 Will. IV., cap. 26, it was decreed that a sum of 1,000*l.* a year, derived from the endowment, which is now greatly increased in value, of Richard Cloudesley's "Stoney Field" or "Fourteen Acres" trust (1517) in Islington, should be shared equally by the three district churches of St. Paul, St. John, Holloway, and Holy Trinity, Cloudesley-square, and the Islington Chapel-of-Ease in Holloway-road. In our article of January 5 last upon Sir Charles Barry's works we commented upon the architectural features of St. Paul's Church, which was erected during the rectorship of the Rev. D. Wilson.

Portman Market. IT is stated that the new market, erected at a cost of about 40,000*l.*, will be formally opened on Thursday, 18th instant. Plans and designs for the new buildings were prepared by Messrs. Gordon, Lowther, & Gunton for the Portman Market, Limited, a company that was constituted for taking a lease of the property from Lord Portman; the purchase price

of the lease and existing market rights were fixed by the vendor at 40,000*l.* The site, being that of the original market, is in Church-street, St. Marylebone parish, and covers an area of 43,500 ft. superficial, opposite the goods terminus of the Great Central Railway, with entrances from Salisbury, Carlisle, and Church streets. The market was established there under the provisions of an Act 11 Geo. IV., cap. 71, and additional powers were obtained in terms of an amending Act of 2 and 3 William IV., cap. 113.

Sketches and Studies by Millais. THE announcement of an exhibition of pictures, drawings, and studies by Millais, at the Society of Fine Arts Gallery, does not seem to have excited the interest that one might have expected, for the attendance at the private view last Saturday was smaller than usual on these occasions. It may be admitted also that the collection was to some extent disappointing, as the majority of the sketches for well-known pictures were of an exceedingly slight description, and could hardly be called "studies." Mr. J. G. Millais, in his short preface to the catalogue, remarks indeed on the fact that Millais, except during his "pre-Raphaelite" period, did not think it necessary to make highly-finished designs for his principal figures; "as a rule he was content, before making a big picture, to cover odd sheets of paper with scores of outlines for it." Many of these are here—the slightest possible experiments in the grouping and pose of the figures; and certainly the finished pictures convey no idea of what of great force and intensity—Millais evidently put his whole heart into this picture; and there is a small highly-finished drawing for the "Ophelia." The drawings made when the artist was still a child—"Turks Robbing a Chest," drawn at the age of nine, and the study of a man's head and two feet, when he was under eight, are remarkable examples of precocious talent; the foreshortened feet are like the work of a practised artist. Very remarkable, too, is the large water-colour of a scene from "Peveril," crowded with figures and very well composed. The sketch for the "Booth of Raleigh" shows that the broad-brimmed hat of the sailor, in the finished picture, was an afterthought; in the sketch he is bareheaded; it was a most happy alteration, by which the effect of the picture gains immensely. The sheet of designs made in 1852 for Ruskin, to show "how natural forms may be made to conform to architecture," is curious, and the border is a noteworthy piece of illumination design, but one cannot wish that the other suggestions (animals worked into the lines of window-tracery, &c.) had ever been carried into execution. Among the complete drawings is the exquisite and delicate little pencil-and-tint work called "Reverie," a perfect little picture in itself. The oil-paintings lent are "Sir Isumbard," which one is always glad to see again; the early picture of "Cymon and Iphigenia," which might have been painted by Etty; and "The Woodman's Daughter," a remarkable work of the early period, which has not been often exhibited: the figure of the little girl is quite in Millais'

best way. Among the few finished drawings are the very fine and powerful conception, "Virtue and Vice," and the pen-drawing entitled "The Race Meeting," showing a keen power of satire such as one would hardly expect from the evidence of Millais' finished pictures only. He might, had he chosen that path, have been the modern Hogarth; but on the whole we may be glad that he did not.

LETTER FROM PARIS.

THE "Commission des Grands Travaux Départementaux" decided last week to ask Parliament to vote a credit of 7,200,000*l.* for the purposes of various important works to be done shortly in the Seine department, a portion of which will be 350,000*l.* for the work of purifying the river Seine from the Marne to the Bièvre; 240,000*l.* for the construction of old age hospitals; 800,000*l.* for new buildings for schools and colleges; 28,000*l.* for restoring and rearranging the Palais de Justice; 120,000*l.* for a school of arts and trades; 100,000*l.* for the completion of an asylum at Maison-Blanche; 300,000*l.* for the construction of a new asylum for idiots; 180,000*l.* for the transfer of the St. Lazare Prison near Paris; 600,000*l.* for various works of architecture; 1,200,000*l.* for new bridges and roads; 360,000*l.* for the construction of a seventh departmental asylum; and various other works. The credits will probably be voted in July next, and such important works will be a boon to the vast army of the unemployed at Paris since the Exhibition.

The "Jury des Habitations à Bon Marché" has now made the awards in connexion with the competition amongst architects, householders and others for sanitary and economical dwelling-houses constructed since January, 1896, at Paris and in the Seine department. The prize of 80*l.* for the best example of collective dwellings was carried off by the "Société Civile du Groupe des Maisons Ouvrières" for a dwelling in the Rue Jeanne d'Arc at Paris, and a gold medal was awarded by the Municipal Council to the architect, M. G. Guyon. Prizes of 40*l.* each were awarded to the owners of various collective dwellings at Paris, and silver medals to the respective architects, MM. Torlet, Dupuy, Goujon, Hennequin, Duquesne, Chabrol, Contrat, and M. Guyon, the architect of the premiated building above-mentioned. In the section of small family dwellings, medals were awarded to the architects, MM. Contelet, Senet, and Meriot. M. Charles Lucas, architect and member of the jury, one of the chief organisers of the competition, read a most interesting report, and announced that a second competition would take place in 1904, under the auspices of the departmental committee, for collective dwellings, hotels and furnished houses, and small family dwellings. The departmental committee of the Bouches du Rhone has decided to open a competition at Marseilles for a type of cheap dwellings.

The jury appointed to decide the competition for the best and most artistic façades of houses recently erected at Paris, mentioned in the last letter, should have made its award last week, but has decided to make one more visit to the various competing buildings before doing so.

M. Albert Maignan, painter, and M. Guilbert, architect, gave a private view a few days ago at the uncovering of the magnificent fresco which M. Maignan has just completed in the dome of the Chapel of the Rue Goujon, raised in memory of the victims of the Bazar de la Charité. The chapel, which was inaugurated in its incomplete state last year, will be opened towards the end of this month in a finished state.

The jury of the section of painting of the Société des Artistes Français has accepted 1,500 out of 6,000 works of painting sent in, not including the paintings "hors concours," of which there are about 600. The Société des Beaux Arts on its side has accepted only 225 paintings out of 3,000 sent in. The votes of the jury of architecture will take place on April 9.

The Empress Eugénie has sent 400*l.* towards the restoration of the old church of Reuil, where are interred the remains of Empress Josephine and Queen Hortense. The foundation-stone of this building, erected in 1584, was laid by the titular King of Portugal; the splendid entrance-porch is due to the munifi-

ence of Cardinal Richelieu, and was the work of Le Mercier, architect of the entrance-door of the Sorbonne.

M. Henri Jouin, secretary of the Ecole des Beaux Arts, has made a careful inventory of the historical statues and monuments raised by subscription in the cemeteries of Paris, with a view of obtaining the immediate restoration of those which have much suffered through carelessness and neglect. M. Grébaux, Municipal councillor, has obtained a vote of money for the proper restoration of the most artistic and best known of these sepulchral monuments.

The "Société des Amis des Monuments Parisiens" are holding a meeting to discuss the following questions:—The exterior aspect of the new stations of the Metropolitan Railway—these stations, designed in modern style, are exciting much adverse criticism; the reservation of the balustrading around the galleries; the restoration of the railings around the Cathedral of Notre Dame; and the delay made by the authorities in re-establishing the site of the Esplanade des Invalides and the ground occupied by the recent Exhibition.

The rather sudden demise of the well-known painter, M. Jean Charles Cazin, is announced. Born in 1841 at Samer, he devoted himself to art at an early age; he first exhibited at the Salon of 1865, and for the next ten years gave himself almost entirely up to the teaching of drawing. He was professor of drawing at the Ecole Libre d'Architecture at Paris, then became director of the Ecole des Beaux Arts at Paris, passing later on to South Kensington, where he was professor of drawing, returning to Paris in 1875, he began to exhibit more frequently at the Salons, attracting great attention by his very personal style. His best known works are the "Flight to Egypt," the "Journey of Tobias," "Hagar and Ishmael" (which won him a first medal at the Salon of 1881), "Judith," and a number of landscapes, mostly on a small scale, but remarkable for breadth of style. He was, at his death, vice-president of the Société Nationale des Beaux Arts. He was entrusted with the completion of the mural paintings of the Pantheon, commenced by M. Puvion de Chavannes. The arrangement of the five large rooms at the Louvre Museum destined to receive the important collection of the Garde Meuble, and form a museum of furniture from the style of Louis XV. to that of the Empire, is nearly completed, and in a few days the removing and installation of the furniture will take place. The walls of these rooms have been decorated in a manner to bring into value their magnificent ceilings. Several splendid examples of tapestries, Beauvais, and Aubusson tapestry, as well as some magnificent Sevres vases are ready in place.

The question of constructing a new hall for the meetings of Parliament at the Palais Bourbon has been again brought forward. In 1898 a vote of 120,000 was voted for this work; and the official architect of the Chambre des Deputés was asked to prepare a scheme for a new hall to be constructed in as perfect a manner as possible as regards heating, lighting, and ventilation. The architect seems to have left the matter in abeyance, for it was proposed to obtain competition schemes from various architects.

The various proposals for the utilisation of the Cirque des Champs Elysees not having proved acceptable, the Municipal Council has voted an annual rent of 2,000l. for the building, and will choose the most advantageous offer that may be made; in the absence of any such offer the building will be at once demolished. The scheme for transforming the Champ des Mars presented by M. Bouvard, architect to the City of Paris, will probably be decided upon and accepted before the end of the present session. M. Bouvard proposes to disengage the facade of the Ecole Militaire by demolishing the Galerie des Machines, and to form a large garden or park leading from the Ecole Militaire as far as the Seine and the gardens of the Trocadero, lined on either side by fine private and flat dwelling-houses. All these houses will be built from one design, the ground floor of each opening on to a covered gallery or arcade with captured columns surrounding the whole of the Champ de Mars, and accessible to visitors to the gardens. The gardens will be "à la française," and will contain a lake 900 ft. long by 330 ft. wide, which will be opened to the public in the winter time; an elliptical course and the lake will be reserved for cyclists

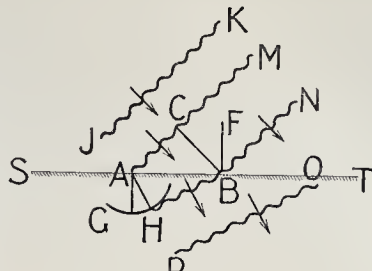


Fig. 1.

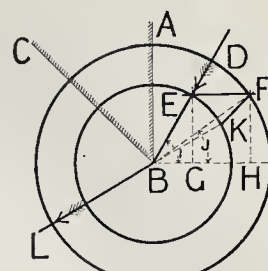


Fig. 2.

and automobiles, and the whole will include alleys for riders, a theatre and restaurants. This scheme, if put into execution, will greatly improve the quarter and form an agreeable separation between the somewhat rough and dirty quarter of Grenelle and the better quarter of the 7th arrondissement.

LUXFER PRISMS, AND PRISMATIC LIGHTING THEORY AND APPLICATION.*

LUXFER PRISMS as they now exist are the result of an exhaustive study of the refraction and reflection of light, and in opening the subject for your consideration, I wish to review some of the elementary laws of these phenomena.

Refraction.

The velocity of light is about 186,000 miles per second as it passes through space on its way from the sun to the earth, that is, through the ether or a vacuum. If it passes through any other medium, such as air or glass, its velocity differs from the above value. The ratio of the velocity of light in vacuo to its velocity while passing through a particular substance is termed the index of refraction for that substance. When light is refracted it is decomposed, due to the fact that the velocities of the various colours in the given substance are not uniform, so that one colour suffers a greater or less change of direction. The violet rays travel slower than the red, so that the index of refraction is greater for the violet than for the red. In determining the index of refraction for any body the yellow rays are usually taken. The index of refraction for the glass of which Luxfer Prisms are made is about 1.53, which indicates that the velocity of the yellow rays in this glass is about two-thirds of their velocity in vacuo, or about 120,000 miles per second. The index of refraction for air is 1.0003, which for our purpose we may regard as unity.

It is a matter of every-day experience that the direction of a ray of light through media of uniform density is a straight line. It is in recognition of this fact that the savage has learned to aim his arrow and the modern marksman his long-distance rifle. This truth was realised long before the nature of light was suspected. Modern science has shown light to consist of a series of waves which are perpendicular to the direction of propagation, or to the ray itself; and, if we could see the waves, their cross-section would probably remind us very much of the waves coming in on the sea shore. What is emphasised here is that the wave fronts are perpendicular to the direction in which they travel.

When light passes from one medium to another we have seen above that its velocity is changed. Its direction is also changed. We shall now see that the change of direction of the ray is a result of the change of velocity. In Fig. 1, let J-K and A-M represent waves of light moving in the direction indicated by the arrows, and falling upon the surface of glass S-T. In a short time after the wave has taken the position A-M, the part of the wave which was at C will have passed through the distance C-B with the velocity of light in air. During the same time the part of the wave which was at A will have passed through a distance about two-thirds as long as C-B. If we strike an arc G-H from A as centre, with a radius two-

thirds of the distance C-B, we are quite sure that the part of the wave formerly at A will be found somewhere upon this arc. The wave fronts J-K and A-M are practically straight lines, and we know by experience that the wave fronts, after passing through a plane surface, are still straight lines. If we draw through B a tangent to the arc G-H, this line B-H will fulfil all the conditions above for the wave front at the second instant of time considered, and by a more elaborate discussion may be shown to be the actual position of the wave front.

It will be noticed that the direction of the wave has changed. If V_1 is the velocity of light in air and V_2 is the velocity of light in glass,

$$\frac{V_1}{V_2} = \frac{CB}{AH} = \frac{VP \sin CAB}{ABH \sin HAG} = \frac{\sin i}{\sin r}$$

where i is the angle of incidence CBF of the ray striking the glass, and r is the angle of refraction HAG of the ray after entering the glass.

Above we defined the index of refraction as the ratio of the two velocities $\frac{V_1}{V_2}$. We now find that this index of refraction is equal to the ratio of the sines of incidence and refraction. This definition is the one which is used in all mathematical work in light, and in what follows we shall use for our law of refraction,

$$n = \frac{\sin i}{\sin r}$$

The Paths of Rays through Prisms.

Let ABC (Fig. 2) represent a section through a refracting prism, and let the light fall upon the prism in the direction DB. We wish to find the direction which the light takes in the prism. Construct at B, as centre, two circles, the ratio of whose radii is equal to the index of refraction. The path of the incident ray strikes the inner circle at E. Project E perpendicular to AB, striking the larger circle at F. FB is the direction of the ray in the prism. For,

$$\sin i = \frac{EG}{EB}$$

$$\sin j = \frac{FH}{FB}$$

$$EG = FH$$

$$n = \frac{FB}{EB} = \frac{\sin i}{\sin j}$$

i is the angle of incidence, therefore j is the angle of refraction.

To find the direction in which the light leaves the prism, project F perpendicular to the face CB, striking the smaller circle at the point K. KB is the direction in which the light leaves the prism. The reasoning is similar to the above.

Let us find the prism angle required to change light from one given direction to another given direction. In Fig. 3, AB represents the surface of the prism. The light falls upon this surface in the direction DB, and we wish to throw this light in the direction B'I. Project E perpendicular to AB, striking the outer circle at A. Produce B'I, striking the smaller circle at G. Draw BH perpendicular to FG. ABH is the prism angle required.

Fig. 4 shows the path of the ray DE through the reflecting prism ABC. FB is drawn parallel to DE. F is projected perpendicular to AB. G is projected perpendicular to the reflecting surface BC. H is projected perpendicular to the refracting surface AC. JB is the direction of the ray on leaving the prism.

* A paper read before the Northern Architectural Association, February 6, by Mr. R. A. Wood, B.S., M.E.

Prism Curve Table.

Upon the prism curve table, Fig 5, the curve marked J was constructed in the following manner:—A diagram similar to Fig. 2 was made for a prism having an angle ABC equal to 30 deg., and a large number of rays DB were drawn striking the prism, and the direction of each of these upon leaving the prism was ascertained. For instance, it was found that the light coming at an angle of 80 deg. from the vertical leaves the prism 7 deg. above the horizontal; that a ray coming at an angle of 74 deg. from the vertical leaves the prism in a horizontal direction; that a ray striking at an angle of 59 deg. from the vertical leaves the prism at an angle of 15 deg. below the horizontal. These various points were plotted on squared paper similar to that used in the curve table, and the smooth curve marked J on the prism curve table was drawn through these points. The curves for the other prisms were drawn in the same manner.

The numbers on the lower line of the prism curve table, 20, 30, 40, &c., are the zenith distances of the rays striking the prism plates. The numbers at the left side of the table are the directions in which the rays leave the prisms. H indicates the horizontal direction, the numbers below H indicate degrees below the horizontal, and the numbers above H indicate degrees above the horizontal. For instance, a ray striking the 50 deg. prism at an angle of 60 deg. from the vertical, leaves the prism in a horizontal direction. The ray striking this prism at an angle of 65 deg. from the vertical leaves 7 deg. above the horizontal, and the ray striking this prism at an angle of 50 deg. from the vertical leaves at an angle of 11 deg. below the horizontal. The prism curve table saves us the trouble of making a diagram such as Fig. 3 whenever we wish to change light from one direction to another. For instance, if we wish to throw light coming from an angle of 55 deg. from the vertical into a direction 1 deg. below the horizontal, we see at once that the 55-deg. prism will answer this purpose.

To Determine What Prisms to Place in a Window.

The general method of lighting by means of Luxer Prisms, is to throw the light from the sky directly into the room. We treat the sky itself as a luminous surface. We do not derive our light from the sun directly. If we did this, we should need to change our prisms every hour of the day. The sky itself is very bright in comparison with ordinary objects. The light from the sky ordinarily falls upon a window and goes straight through and reaches the floor at a point not very far distant from the window. The floor is of a dark colour reflecting perhaps only one-tenth part of the light falling thereon, so that perhaps nine-tenths of the light is lost upon reaching the floor. If prisms are placed in the window the light is thrown directly back into the room before striking the floor. The first object which this light strikes is the one which we wish to illuminate, and in general it is of a light colour. The prism plate in the window practically takes the place of a skylight. It is to be thoroughly understood that prism plates placed in windows do not increase the quantity of light entering the room. They simply re-distribute the light in such a manner that it is utilised to a much better advantage.

Uniform Plate.

In determining the proper prism to place in any window, we must know both the direction in which the light falls upon the prism and the direction in which we wish to have the light leave the prism. If we know the direction in which the lowest light falls upon the prism, we know for ordinary cases that the other directions lie between this and the vertical, and if we know the direction in which we want the highest light thrown in the room, the other directions in which we wish light will be between this and the vertical in a downward direction. If we throw the light which falls upon the prisms in the lowest directions so that it leaves the prisms in the highest direction desired, then, in most cases, the other rays of light falling upon the prisms between the lowest direction and the vertical will illuminate other parts of the room which we wish lighted and our problem is substantially solved.

In Fig. 6, let L_1 be the lowest direction in which light falls upon the prism plate, and let

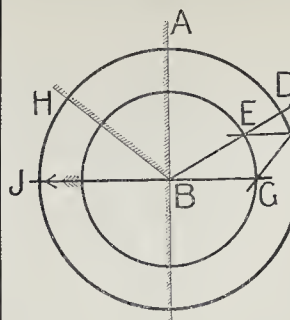


Fig. 3.

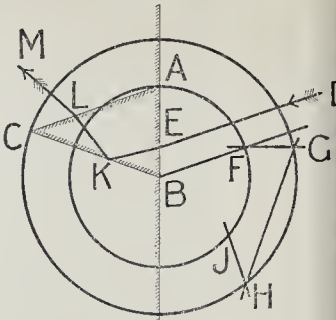


Fig. 4.

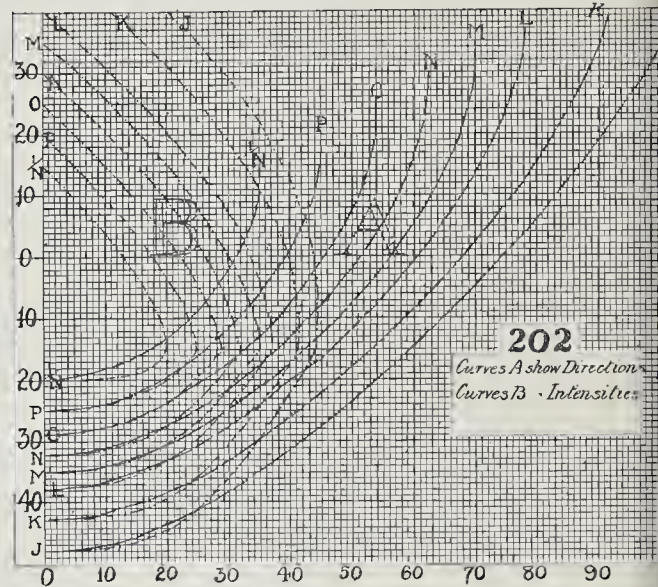


Fig. 5.

A be a desk which it is desired to illuminate and which is the object farthest back in the room and highest up from the floor that we wish to illuminate. If such a prism is placed in the window that the light L_1 (striking the lowest prism in the window) takes the direction D, (the direction from the lowest prism to the desk), then the desk A will be lighted by every prism in the window; for, although the light L_2 , which is parallel to L_1 and striking the upper prism of the window, goes above the desk A, there will be some other ray L_3 higher than L_2 which will take the direction D_3 and strike the desk. All the other rays above L_3 will go lower than D_3 and into the part of the room which we wish to illuminate, and practically all the light striking the window will be utilised.

If there is no prism which will throw the lowest ray directly upon the point desired it is usually best to select the one which throws the light above the point. In rough work it is sufficient to throw the light in a horizontal direction, and in rooms which require a general illumination it is better to throw the light rather high than to confine it too nearly to the floor. For the general effect of the window plate upon people inside the room, it is commonly best if there is light enough to spare to arrange the prisms so that none of them will appear dark to a person in any part of the room.

Plate of Varying Prisms.

It may happen, in case the prism plate is quite deep and in case the desk A is quite near the window, that it will be desirable to place a prism in the top of the plate which is different

from that placed in the bottom of the plate. Suppose that we wish to place prisms in upper sash 5 ft. deep, the zenith distance being 51 deg., and we wish to light a desk 20 ft. from the window, the top of which is 10 deg. below the level of the lower edge of the upper sash and 17 deg. below the upper part. Looking to the left of our table, finding the line of 10 deg. below the horizontal, and following it to the right, we find it intersects the vertical line marked 51 upon the L prism curve. If, therefore, we place the L prism in this window, the desk will be lighted satisfactorily, and the bottom of the remaining light will fall between the desk and the window. It may be noticed, however, that the K prism curve crosses the 51 deg. angle at 17 deg. below the horizontal. So that if we put L prisms in the lower half of a window and K prisms in the upper half, we shall accomplish the same result so far as the desk is concerned, and shall not throw so much light over the desk, but will save this for a space between the desk and the window, an area which we wish to illuminate.

Light Near the Window.

Referring now to the intensity curve table will be noticed that the space which becomes brightest in a room is now left practically without light. The lowest light from the prism is 25 deg. below the horizontal, from the N prism 32 deg., &c. It is evident, therefore, that there is a dark area in a room near the window. In order to obviate this difficulty it is absolutely necessary in almost all cases to insert a few prisms of low angle in the prism plate. For instance, given a zenith distance

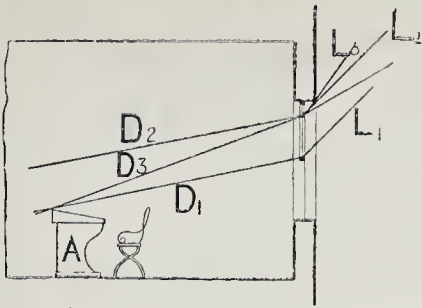


Fig. 6.

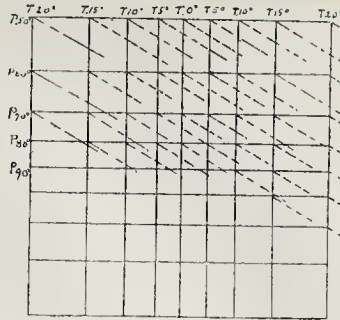


Fig. 7.

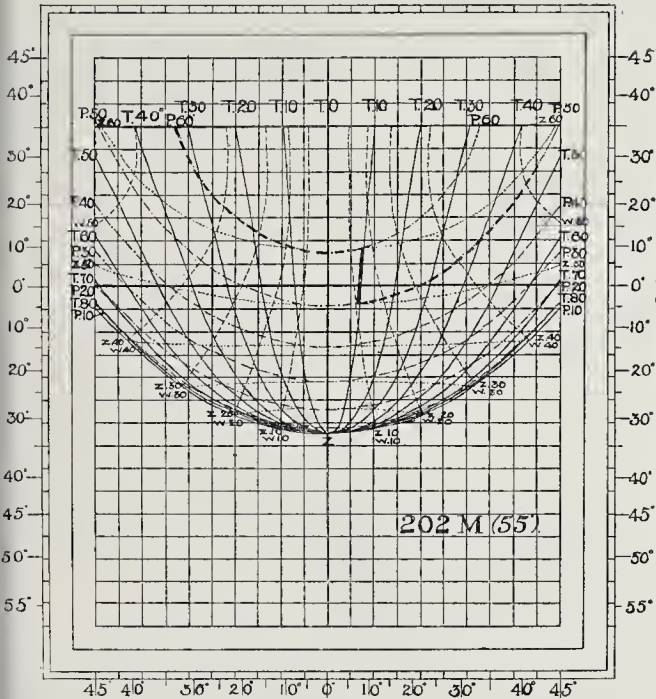


Fig. 8.

will then be divided by section lines, the intersections of which will determine points upon that surface. At the intersections of these lines let lines be drawn perpendicular to the plane of the lines. We now have three series of lines, Fig. 7, which may be taken as representing the principal edges of any building which may form an obstruction to the light which comes to the proposed prism plate. Thus a horizontal line would represent the top of such a building. On the diagram the horizontal lines are lettered "P." One of the vertical lines referred to, marked "T," would represent the side of the building. One of the last set of lines, lettered "W," would represent the retreating edge of the building.

Let us now imagine each of the three sets of lines to which we have above referred as constituting a source of light, that is, as being composed of molten platinum, so that as one viewed the surface each line would be distinctly visible. If we further use our imagination and consider that this triple system of lines be projected upon the back wall of the room to be lighted by means of the prism plate, we would have upon such back wall a distorted reproduction of the system due to the refraction of the straight lines into curved lines. If the prism plate were composed of prisms termed 202 M the result would be in effect such as is shown in fig. 8, which upon examination is seen to consist of three sets of lines, the T lines which represent the shadows of the vertical edges of buildings, the P lines and W lines representing the shadows of the horizontal and retreating edges respectively.

When uppermost edges of the buildings upon the opposite side of the street form a regular or straight line, the prism table referred to previously could be used, but when the horizon consists of an irregular line of buildings, for instance, when there is a tall building directly opposite the window and lower buildings to the left, it becomes necessary to use the back wall image. In the first place, the zenith distance of the uppermost horizontal edge of the building must be determined. Let us suppose this to be 55 deg., and that this line extends to the right indefinitely, and to the left until it intersects a vertical plane at an angle of 10 deg. with the principal plane to the prism plate. This line may now be traced upon the back wall image, and is shown as a heavy dotted P line. At this side angle of 10 deg. we assume that the high building terminates, thus exposing a vertical edge extending downward, and that the remainder of the horizon to the left is formed by a building the zenith distance of which is 60 deg. The vertical edge above referred to is found upon the diagram and is shown in heavy dotted lines, further the horizontal line is found to be as shown. The irregular line thus determined may now be traced upon the back wall, which is another vertical plane supposed to be at the rear of the prism plate a unit's distance or the distance represented by the width of the street. This shows accurately the dividing line between the illuminated part of the back wall and the dark part of the same, and it may be at once seen whether the various desks, &c., which are required to be lighted are within the range of illumination by the prism plate. If it be found that the prism plate examined does not throw the light high enough in the room, it will be necessary to further examine a plate supposed to be formed of prisms of a higher angle, and it may yet be found that the desired illumination is not

40 deg. we should probably choose either the 65 deg. or the 70 deg. prism for the body of the prism plate. Suppose it is 65 deg. The light from this prism goes down as low as 28 deg. below the horizontal, but for the last few degrees the light is not very brilliant, as indicated by the intensity curve to be explained later. In order to illuminate the area left dark, it will be necessary to insert either some J or K prism lenses. The quantity of the low-angle prisms can be obtained roughly by considering the area to be lighted by these and by the body of the prism plate. If the area to be lighted by the body of the prism plate is on the average 30 ft. from the window, and if the area to be lighted by the low-angle prisms is on the average 10 ft. from the window, then, since roughly the intensity of the light varies inversely as the square of the distance from the window, the proportion of the two window lights should be about as 100 is to 900. The proportion ordinarily used is from 10 per cent. to 20 per cent. As a matter of choice in the case illustrated above between the J and the K prisms, probably the K should be selected, simply as a matter of appearance. If the J prism were selected it would be possible to select a point in the room such that there would be a line of prisms across the window, all of which would be dark.

The method of using the intensity curve table rapidly is to select the prism, trace this

curve down to the left-hand side, and then trace the horizontal line to the right back to the zenith distance and select the proper prism curve at that point for the low angle prism light. In many cases, even where the light is not required up close to the window, it is still advisable to insert a few of these prism lights of low angle in order to relieve the monotony of the uniform prism plate. This effect is seen both from the inside and the outside.

Back Wall Images.

The curve already described under the heading of "Prism Curve Table" is used for determining the distribution of light in the principal plane, that is, the plane perpendicular to the elements of the prisms. It does not, however, show anything definite concerning the light which passes through the prism plate in any other plane, and we, therefore, must make use of what is termed back wall images in order to determine the distribution of this side light. If the observer stand looking through the window to be treated, directly at the wall on the opposite side of the street, he may divide the surface exposed to view by a horizontal line at the level of his eyes and by another vertical line in a plane perpendicular to the prism plate. Let other lines be drawn parallel to the two lines mentioned and at distances of 5 deg. apart. The vertical plane forming the surface of the opposite building

obtained owing to the higher building referred to above. It will then be possible to overcome the shadow of the high building by using tilted prisms, that is to use prisms the elements of which are tilted at an angle of from 30 to 60 deg. with the horizontal. Such prisms utilise the side light more effectively. Since there is a back wall image for each prism whether horizontal or tilted, it is always possible to determine the distribution effected, and by the use of judgment to quickly determine the best prisms to be used under the existing conditions of light.

Prism Table.

The angles obtained from the use of fig. 2 are tabulated for the prisms J, K, L, M, N, O, S, and P, and are shown in fig. 9. To illustrate

PRISM TABLE.

Deg.	J. Deg.	K. Deg.	L. Deg.	M. Deg.	N. Deg.	O. Deg.	S. Deg.	P. Deg.
70	4°	3°	—	—	—	—	—	—
69	5°	2°	—	—	—	—	—	—
68	6°	1°	—	—	—	—	—	—
67	7°	0°	10°	—	—	—	—	—
66	8°	1°	8°	—	—	—	—	—
65	9°	2°	7°	—	—	—	—	—
64	10°	3°	5°	—	—	—	—	—
63	11°	4°	4°	—	—	—	—	—
62	12°	5°	3°	9°	—	—	—	—
61	13°	7°	1°	8°	—	—	—	—
60	14°	8°	0°	6°	—	—	—	—
59	15°	9°	1°	5°	—	—	—	—
58	16°	10°	2°	3°	—	—	—	—
57	16°	11°	3°	2°	10°	—	—	—
56	17°	11°	4°	1°	8°	—	—	—
55	18°	12°	5°	—	6°	—	—	—
54	19°	13°	6°	1°	5°	—	—	—
53	20°	14°	7°	3°	3°	—	—	—
52	21°	15°	8°	4°	2°	—	—	—
51	22°	16°	9°	3°	0°	—	—	—
50	23°	17°	10°	6°	1°	10°	—	—
49	23°	18°	11°	7°	2°	8°	—	—
48	24°	19°	12°	8°	3°	5°	—	—
47	25°	20°	13°	9°	4°	3°	—	—
46	26°	21°	14°	11°	5°	2°	8°	—
45	27°	21°	15°	11°	6°	0°	6°	—
44	27°	22°	16°	12°	8°	1°	4°	—
43	28°	23°	17°	13°	8°	2°	2°	—
42	29°	24°	18°	14°	10°	3°	1°	8°
41	30°	25°	19°	15°	11°	3°	1°	3°
40	31°	25°	19°	16°	12°	0°	2°	3°
39	31°	26°	20°	17°	13°	7°	3°	2°
38	32°	27°	21°	18°	13°	8°	4°	5°
37	33°	28°	22°	19°	14°	9°	6°	1°
36	34°	28°	22°	19°	15°	10°	7°	2°
35	34°	29°	23°	20°	16°	11°	8°	4°

Fig. 9.

the use of this table suppose we require to find the proper prism to use in a window facing on a street 40 ft. wide, the buildings on the side opposite the window extending to a height of 31 ft. above the window; by laying out the width of street and the height of building on a drawing board, or by reference to a table of trigonometric functions, we find the zenith angle to be 52 deg. Entering the table in fig. 9 with this angle, and assuming that we require the highest light to be about horizontal, we find that the prism which most nearly answers the purpose is the N, which throws the 52 deg. light 2° deg. above the horizontal.

Luxfer Prism Protractor.

This is a very ingenious invention, the object of which is to approximately and quickly determine the prism which may be placed in a window in order to throw the light into the room in a horizontal direction. It consists of a transparent celluloid disc with the diagram, fig. 10, impressed upon its surface. A section through the window, the street, and the opposite building is laid out on paper to scale; a line is then drawn from the lower edge of the prism plate to the top of the building opposite; the protractor placed upon the diagram in proper position, as shown, at once indicates the prism to be used. The candle-power of the prism and the page in the "Luxfer Prism Manual," which very exhaustively describes the prism and the way in which the light will be distributed by it. This protractor, of course, deals only with light in the principal plane, and cannot be used in cases of a very irregular horizon.

Canopy Curves.

The diagrams and tables considered up to this point have referred to sash or refracting prisms, but it is also necessary to study the distribution of light by the canopy or reflecting prisms. This distribution depends mainly upon two values, viz.:—The zenith distance and the slope of the canopy, this latter being

the internal angle between the canopy and the vertical. The intensity of the light coming from a canopy prism under the various conditions of slope and zenith distance has been

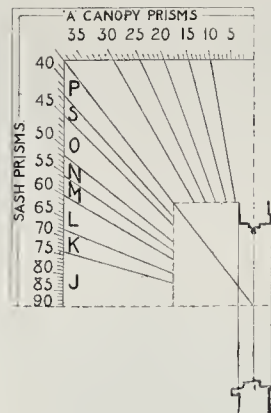


Fig. 10.

determined by the use of a photometer. The measurements so obtained are plotted and curves formed by reference to which the proper slope of the canopy may be found when the zenith distance is down.

Luxfer Prism Candle-power.

The first question asked by one considering the use of Luxfer Prisms is—how much light will they give? and it is in order to give an intelligent reply to this query that a table of Luxfer Prism candle-powers has been evolved (fig. 11). The first problem to be solved in this

PRISM CANDLE-POWERS.

Advised for Rooms Lighted from the End.

WIDTH OF ROOM, IN FEET.	LENGTH OF ROOM, IN FEET.									
	20	30	40	50	60	70	80	90	100	
10	250	280	320	360	420	480	550	630	720	
15	370	410	460	520	600	690	800	910	1050	
20	480	540	600	670	780	900	1050	1190	1380	
25	580	670	730	820	930	1100	1300	1470	1710	
30	750	870	970	1100	1300	1550	1850	2150	2500	
35	880	1020	1120	1300	1500	1800	2150	2500	2950	
40	1000	1160	1280	1480	1720	2000	2350	2750	3200	
45	1140	1310	1440	1660	1930	2250	2650	3100	3600	
50	1270	1450	1600	1850	2150	2500	2950	3450	4000	
55	1380	1580	1750	2020	2370	2750	3250	3800	4400	
60	1500	1740	1950	2240	2650	3100	3650	4250	4900	
65	1650	1900	2150	2480	2950	3450	4050	4750	5500	
70	1800	2090	2340	2700	3200	3750	4400	5150	5950	
75	1950	2240	2500	2870	3400	4000	4700	5500	6350	
80	2050	2340	2600	3050	3550	4150	4900	5750	6650	
85	2150	2440	2700	3150	3700	4300	5100	5950	6850	
90	2240	2540	2800	3250	3850	4450	5300	6150	7050	
95	2340	2640	2900	3350	4000	4600	5450	6300	7200	
100	2440	2740	2940	3400	4100	4700	5550	6400	7300	

Fig. 11.

connexion is the c.p. of the source of light, in other words the c.p. of the sky. This has been determined by actual measurement, and for the purpose a series of observations extending over a period of five months has been made at the Chicago Luxfer Prism Laboratories. Observations were taken three times a day at 9 o'clock, 12.30, and 4.30. The result has been used as a basis upon which to estimate the c.p. of a square foot of the various sorts of Luxfer Prisms most in use. The results are tabulated as follows:—

J	prisms, 13 c.p. per sq. ft.
K	" 12 " "
L	" 11 " "
M	" 10 " "
N	" 9 " "
O	" 7 " "
S	" 5 " "
P	" 4 " "
A	" z.d., 35 deg. 0 c.p. per sq. ft.
A	" z.d., 30 " 8 " "
A	" z.d., 25 " 6 1/2 " "
A	" z.d., 20 " 5 1/2 " "
A	" z.d., 15 " 4 " "

It is found by experience that a certain candle-power in a room of given length and width is necessary in order to produce a desired illumination. The values of the required candle-power for various sized rooms

varying in length from 20 ft. to 100 ft. is shown in tabular form. If we have a room 25 ft. wide and 40 ft. deep, we find by entering the table with these values a required candle-power of 730, and if the zenith distance be such that "M" prisms will light the room, the candle-power of "M" prisms under proper conditions being 10 per square foot, the required area in square feet of prism plate to give a first class illumination is 73. This, of course, will give the required degree of illumination in the back part of the room. If it is necessary to illuminate the room to such a high degree, a less area of prisms may be used with satisfactory results.

It will be seen by the foregoing that the object of the designers of Luxfer Prisms has been to properly distribute the light which is available, and that in the case of refracting prisms they do not attempt the impossible task of increasing the amount of light entering a window. In the case of the 303 "A" prism which is used as an outside canopy or reflector the result is produced not only by a better distribution of light, but by an actual increase of light entering the window.

In the case of basement lighting the same principle applies as in lighting by means of vertical window prisms, the object being to effect a better distribution of the light, making the glass area of the pavement light as large a percentage of the total area of the light as possible.

Fig. 12 shows a suggested section, where a light well has to be used, for getting the

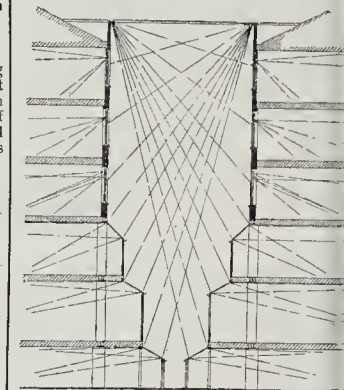


Fig. 12.

maximum amount of light into the building. The skylights to the basement, ground, and first floors would be glazed with Luxfer Prisms, and the upper sashes of second, third, and fourth floors. The dotted lines show how the light would be deflected by the prisms.

THE ARCHITECTURAL ASSOCIATION.

The ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W. Mr. H. T. Hare presided in the absence of the President, Mr. W. H. Seth-Smith.

The minutes of the last meeting having been read and confirmed, Messrs. W. Boyd, H. Lawrence, H. Prince, and E. R. Sladen were elected members of the Association.

The Chairman announced that Mr. H. D. Searles-Wood had consented to act as a trustee of the Travelling Studentship Fund.

House List.

The meeting having approved of the nomination,

The Chairman read the House List for the next session, as follows:—President, Mr. W. H. Seth-Smith; vice-presidents, Messrs. G. H. Carvell and E. Guy Dawber; committee (ten to be elected), Messrs. H. R. Appelbee, C. H. F. Compyn, A. C. Dickie, R. H. Weymouth, F. B. Clapham, W. H. Raffles, W. A. Pite, A. H. Goslett, W. J. Tapper, Hon. A. McGarrel Hogg, L. Amblar, A. Bolton, W. A. Forsyth, H. T. Hare, Arnold Mitchell, G. H. Fellowes Prynne, and E. Howley Sim; hon. treasurer, F. G. F.

Hooper; hon. librarian, F. J. Osborn-Smith. Other officers—C. H. F. Comyn and W. A. Jeckells, assistant librarians; Messrs. R. S. Balfour and H. P. G. Maule, hon. secretaries; Messrs. E. Greenop and G. M. Nicholson, hon. auditors; Mr. W. H. Jamieson, hon. solicitor; and secretary and registrar, Mr. D. G. Driver.

The Chairman said that it was open to any member of the Association to nominate other names before the next meeting.

The Chairman also announced that the following reply had been received from the King on the address of condolence recently submitted by the Association:—

"SIR.—I am commanded by the King to convey to you hereby his Majesty's thanks for the loyal and faithful address from the members of the Architectural Association, expressing their sympathy with his Majesty and the Royal Family on the occasion of the lamented death of her Majesty Queen Victoria.—I am, sir, your obedient servant,

C. T. RITCHIE."

Small Suburban Houses.

Mr. H. D. Searies-Wood then read the following paper on "Small Suburban Houses"—"I have no idea how the Committee intended this subject to be divided between Mr. Appelbee and myself, but as I suppose the most useful purpose would be served by each of us speaking from his own experience the things that he has learnt, I propose to deal with houses of the rental value of from 80l. to 200l., Mr. Appelbee having kindly undertaken to treat a houses of the terrace and small semi-detached types.

There is one catch phrase current which it seems impossible to keep out of any conversation at the present time; I mean the reference to the man in the street. Well, I take it that the majority of him live in either one or other these various types of house.

One of the peculiarities of the suburban man is that he seems to wear the neighbourhood out in the first term of the tenancy, and thus happens that the oldest inhabitant in most suburbs has been in occupation about seven years. Now, this being the case, it is obvious that in planning these houses they need to be designed to suit the multitude, and not individual tastes.

The man in the street is a man of social bits, with a fairly large circle of acquaintances. Let us take a typical family, consisting of a father and mother, with a grown-up family of four, two boys and two girls. The father and two boys playing golf and billiards, the other and girls devoted to cards. Now, what would be the proportion of the various rooms in such a family, supposing we fix the rental at 200l., and give an acre and a half of ground at 25l. per acre per annum. This gives in round figures 3,000l. on a per cent. basis as the cost of the house.

The relative size of the several reception-rooms is the first consideration. The views of the man in the street and his wife are to differ in regard to which should be the larger, the drawing-room or the dining-room, but over this difficulty sometimes by making a drawing-room, dining-room, and billiard-room all the same size, and it makes a very satisfactory house, but I find it better to give advantage to the drawing-room as being the room in which most of the social functions take place, and the general living-room. Now it is difficult to convince the mere man of this case. Pipes and the old clothes are to the heart of every man lose some of their flavour or comfort in the surroundings of a drawing-room, and hence, as I say, the mere man is apt to rebel at the drawing-room being larger than the dining-room; but my experience is that in the inevitable compromise a drawing-room comes out the larger room. In houses of this kind I find that the luxury of a large hall cannot be afforded; it is a beautiful feature in large houses, but where it can be obtained by the sacrifice of size in the dining-room and drawing-room, I am convinced it does not pay. (I generally lay a parquet or in the drawing-room, though nowadays carpets are generally given in the various public halls that are found in most suburban districts.) I had some few years ago to advise a man as to advancing their money to build a hall house for a young couple who were just married, who thought they would like a quaint little house built out of the wife's trust money, when the plans were submitted to me I reported that in the event of the house being let considerable additions would have to be made. I remember one of the features was a large entrance-hall, which was

obtained by making the dining and drawing-room a combination. The drawing-room one end of the room, and the dining-room the other end. In spite of my advice the house was built and occupied by the young couple for, I think, about two years, and they then took an ordinary house in the country, the quaint conceit remaining empty for over a year, and was then let to a tenant who insisted on the trustees adding another wing with a dining-room and some other accommodations that by no stretch of the imagination could be considered quaint. This incident has often occurred to me when I have seen similar designs in the professional papers, and I wonder what alterations will be made in the course of time, and such thoughts as these have a chastening influence whenever I feel disposed to attempt the unusual. I hope I shall not be misunderstood. I have a great admiration for the work of many of our talented architects whose houses will always interest; but small suburban houses must to a certain extent follow the more or less stereotyped plan which, after all, is the concentrated experience of many generations of builders.

I personally have a great objection to that form of hall which consists of a passage from the front to the back of the house. It quite, to my mind, destroys the comfort of the hall, and in small houses I think what is called the garden entrance is unnecessary. I like also, if possible, to shut off the staircase from the hall.

The position of the billiard-room in relation to the house wants careful consideration. I always try and make a separate approach to the billiard-room from the outside. In the suburbs it is usual to have certain evenings in the week for billiards, when it is understood that your friends will drop in without a special invitation for a friendly game, or to play in a handicap. If there is a separate entrance these visitors can come into the room without disturbing the other members of the family, and can leave without rousing the household if the billiard-room is kept open late. It always seems to me that a billiard-room in a small house such as we are now considering is an expensive feature, if you look at it in the light of the largest reception-room in the house being devoted to a game which on the average is not played for more than four hours a week.

To obviate this, I have found Burnett's patent machinery for lowering the table into a pit and allowing a floor to be laid over the space makes this room available for other purposes of entertainment. This machine consists of four screws which work in a steel frame, and are connected by means of bevel cogs so as to all work together and thus prevent the travelling table jamming; the screws bring the table up to the steel bed plate, and the table comes up each time to a dead level. When the table is lowered a beam of oak is laid across the opening and the flooring, made in convenient widths, is laid down on the beam and the ends caught by a hinged board secured with cups and screws which hold the false floor in its place. It takes about twenty minutes to get the table down and the false floor laid, and about thirty minutes to get the table back again and the false floor stowed away in the pit.

I find it suits the man in the street to give him a dining-room, drawing-room, and billiard-room, the last taking the place of the small sitting-room usually called the morning-room or library on the ground floor. The billiard-room in this case has usually a writing-desk in it where the men of the family do what writing they have to do, and, in fact, use it as a general morning-room. This room should always be heated by hot-water pipes. Nothing is more miserable than to go into a cold billiard-room after dinner, and the open fire is apt to make one set of cushions softer than the others. If this plan is adopted the ladies want a room upstairs for work, and this can often conveniently be made in the attic, and when so placed piano or violin practice can be indulged in without stint for fear of the feelings of the rest of the household.

The relative position of the kitchen to the dining-room is another point which regulates the plan to a great extent so as to avoid as much as possible having to cross the house in serving the meals; but it is a moot point whether, in the sized dining-rooms that are usual in the class of house under consideration, two doors—one from the hall and one from the service passage—are not more conducive to draught than the convenience of the service warrants. But I am not in favour of hatches.

The dining-room should never be less than 15 ft. for the convenience of serving round the table. A recessed fireplace on the side is also a pleasant feature, and gives interest to the room.

The kitchen should be so placed that the housemaid's pantry can be reached without passing through the kitchen. This pantry should be as large as possible, and all the glass and silver should be washed and cleaned in it.

The kitchen should also be a good size. It should be remembered that, in addition to the work of preparing the food, it is the living-room of the servants. It is not usual, in houses of the size we are considering, to provide a servants' hall, and therefore the kitchen should be made larger to suit the double purpose. Good light on the right-hand of the range is very important, and a cheerful outlook, if possible. In these houses I always make the boilers in the ranges of the kitchen and scullery both work the hot-water system, so that when in the summer the cooking is done on the smaller range, there is still a circulation of hot water over the house. I find it a good plan also to have a copper cylinder on the floor on the first floor as well as the hot tank in the cistern room. This cylinder heats the linen-closet and gives a good storage of hot water.

If the family are given to taking cold baths in the morning there is a great run on the bathroom, and I find that a second bathroom is a good feature, if possible; but if not, a spray bath on the head of the slipper bath enables the bath to be used much more quickly.

The staircase is one of the few opportunities in a house of this character that offer scope for a little careful detail. Of the three types of stairs—the open well, the dog leg, and the stairs between walls—I fancy the last gives a little more mystery to the planning, the upper floor not being disclosed until the half space is turned. A second staircase is a good feature, if it can be arranged.

For the family we are planning for, eight bedrooms, a dressing-room and a workroom at least are needed. As a comparison, taking the area of the rooms on the ground floor as 100, the following is the proportion of the plan marked A:—

Billiard-room...	24	Bedroom...	12
Drawing "	19	"	7
Dining "	15	"	16
Hall	11	"	15
Kitchen	9	"	9
Scullery	5	"	9
Staircase	4	"	5
Housemaid's pantry, cupboards, water-closet, and lobby	13	"	9
	100		82

We have been considering a plan for a house of the rental value of 200l. Now let us see what reductions are required for one of 80l.

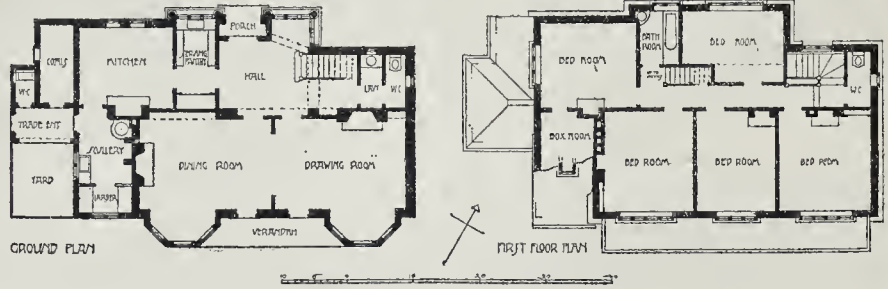
We will take the ground as a third of an acre. This would represent a plot 60 ft. by 240 ft., and the ground rent would be 13l. 10s. This leaves, on a 5 per cent. basis, 1,300l. for the house.

I make the dining-room 16 ft. by 16 ft., with a large bay, the drawing-room 16 ft. by 15 ft., with folding doors into the hall, which is arranged so as to be used as a morning-room, or in conjunction with the drawing-room. The vestibule is approached through the housemaid's pantry, thus allowing the servant to answer the door without passing through the hall. The housemaid's pantry is arranged with a large gas-stove, so as to make it a summer kitchen. The kitchen is a fair size, with a scullery as a place for dish-washing only.

On the first floor are four bedrooms, corresponding in area to the four rooms on the ground floor, the bathroom and water-closet being over the vestibule. In the attic are two bedrooms, dressing-room, linen-closet, and cistern-room. I think it is very important, from a sanitary point of view, to put the cistern in such a position that it can be readily and easily examined.

Making the same comparison as before, the areas are:—

Dining-room	30
Drawing-room	28
Hall	10
Staircase	6



A SMALL SUBURBAN HOUSE

H. R. APPELBEЕ, Architect.

Kitchen	13
Scullery	4
Housemaid's pantry	6
Lavatory	3
100	

This house, with reduced area, still gives good accommodation for reasonable social usages, and in both you will see the endeavour has been to work out the plans with the minimum amount of passage-ways. I think that this has been overdone myself, and both plans would be improved by more space in the staircases; but this would have been at the expense of the rooms.

In giving the percentage areas I have been endeavouring to arrive at the just proportion between the various rooms in houses such as we have under consideration. It appears to me that it would be a useful table if we could arrange some such scale. The problem appears to me to be as follows: Given the rental value of the house and no conditions as to the size of particular rooms being imposed, what has been found to be the relative area of each room as the result of experience?

Of course, having fixed the areas for the ground floor, the other floors must follow more or less these dimensions. The comparison also depends on the houses compared being equally well built.

I have now described two plans at either end of my scale. The intermediate plans show a gradual increase in the scale of the accommodation, and you will find that as you rise from the lower to the higher rent the tenants become much more exigent. The question, I think, that would be most profitable to discuss is whether modern planning is

abreast with the spirit of the age. Most buildings designed for particular purposes nowadays are highly specialised. Do our domestic buildings compare successfully with these specialised buildings in suiting the requirements of the persons occupying them, or are they governed by considerations other than the needs of the tenants, such as the reproduction of old buildings whose appropriateness to modern usage is rather open to question?

Mr. H. R. Appelbee then read the following paper on the same subject:—

It is impossible in the time at my disposal to-night to do more than glance at a few of the points which influence the design of small suburban houses. My illustrations are limited to houses of not more than ten rooms, and of these I have excluded the very smallest where it is probable no servant would be kept. Also excluded are houses having rooms for special purposes, such as doctors' and artists'.

The first point to influence the design is the site. It is obvious that all, especially in London, cannot have the advantages of building on gravel or high land, but the selection of a particular road is open to most. Personally, I would not care to own a house in a road running east and west, or, even worse, north-west to south-east, unless the site is large enough to permit side lighting as well as from front and rear.

Rooms should be so arranged that the sun may enter at least once every twenty-four hours. This is not always possible; but to arrange living-rooms where it is impossible, even during long summer days, seems to me little short of criminal. Great care is, however,

necessary, as different rooms require the sun at different times of the day, the general rule being that it follows with our day's work; of bedrooms should face the east or south-east, the breakfast-room south-east, the drawing-room south to south-west, the kitchen south-east, while a study or library north, with a sunny window as well, or east. In a terrace house the fronts should be south-east and north-west; in others where side light is also obtainable more latitude is permissible.

As to prospect, it is nearly always the same thing for the dweller near a large town—buildings everywhere. There should, however, be trees both in the road in front and in the garden, and creepers on the house itself.

The next point that will come under consideration is the cost, which will fix the size and number of the rooms and the amount that can be expended on their fittings and decorative estimates by cubing or areas is apt to be very misleading. For example, the areas of all from the sitting-rooms to the pantries may be increased by 50 per cent., while the cost is only increased about 20 per cent., assuming that the heights are kept the same and the fittings, the same quality.

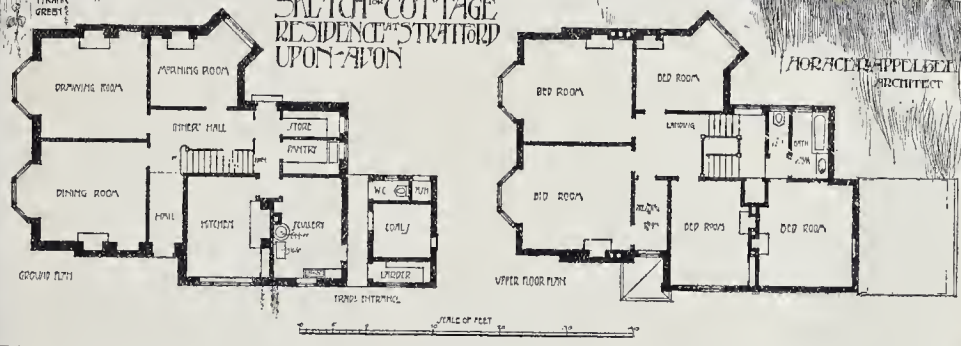
To illustrate this take a terrace house 16 ft. between the party walls and 25 ft. from front to back:

- area = 25 ft. by 16 ft. = 400 sq. ft.
- Enlarge to 20 ft. from party wall to party wall and 30 ft. from back to front:
- area = 30 ft. by 20 ft. = 600 sq. ft.
- Assume the heights to be the same and compare the cost.
- Party walls 50 ft. and 60 ft. long = 20 p



SKETCH FOR COTTAGE RESIDENTIAL STRATFORD UPON-AVON

MORACE & PPELBEY ARCHITECT



nt increase, front and back walls 32 ft. and 30 ft. — say 20 per cent. increase (is really a little less). Skittings and cornices will follow the walls. The finish to floors and ceilings and the roofing will obviously show a 50 per cent. increase. The joists of the upper floors will, however, show more, and more depth being required owing to increase of span, and will be found to require in the particular instance quoted an additional 20 per cent. Many items require no increase whatever, e.g., range, copper, stoves, and mantels. With the drainage and plumbing work, which is very expensive, the main items of manholes, vertical oil pipes and service pipes, bath and water-closet apparatus and sinks are not increased, and it is only the horizontal pipes between them and these to the very small amount of 5 per cent.

For the purpose of this paper I have analysed the bill of quantities of a 1,450 l. house, and I find on the above principles

About £240 with no increase =	£240
" 930 " 20 per cent. " =	1,107
" 280 " 50 per cent. " =	420
And for extra depth of floor joists, say...	13
£1,450	£1,780

between 22 per cent. and 23 per cent. increase of cost for 50 per cent. additional accommodation. This point is somewhat emphasised because its not having been realised seems to account for much of the cramped accommodation we shall find in the plans appended.

While on the subject of cost, a word of warning should be said on what is perhaps the greatest architectural sin of the Victorian æra, viz., the façade built in a more expensive manner than the return faces. This arrangement gives a thin cardboard-like effect and

entirely destroys architectural solidity. It would be cheaper as well as more artistic to build the main front of similar materials to the sides and back. Perhaps a new reign and new century will alter this.

The first sketches should always show the principal furniture, and the relationship of doors, windows, and fireplaces should be considered with regard to each other and to the furniture.

Inside v. Outside Chimneys.—If the fires are well grouped, two or, at the most, three chimney-stacks will be required. If they are on inside walls, the house is more economically warmed, and there is less chance of a draught from a cold flue. On the other hand, a compact plan usually brings the internal doors together around a small hall or landing, and in order to prevent the doors spoiling the sitting space around the fires or the plan from becoming straggling, the chimney breasts have usually to be planned in the outside walls.

The Casement v. the Double-hung Sash.—The double-hung sash is unquestionably convenient for lighting, ventilation, cleaning, and it is easy to keep clear of blinds or curtains; it is easily made weathertight and is simple to fasten, but it probably requires more skill to make its appearance equal to that of a casement. The mullioned window, especially when long and low and without a transome, is undoubtedly picturesque. The casements are difficult to keep weathertight unless they open outwards, in which case one at least of an odd number of lights can never be cleaned from the inside of the room, and they interfere with flowers on the window-sill. An even number of lights for cleaning purposes must have all to open in pairs. Opening inwards overcomes the cleaning, which is perhaps the greatest difficulty, but makes others with blinds,

curtains, or a window-seat, and the absence of the weathertight qualities.

The Dining-room in a house of this class is the most important room, and in planning this the furniture should be sketched in, and its dual use as room for meals and the family sitting-room taken into consideration. A dining-table varies from 3 ft. 6 in. to 4 ft. 6 in. wide, and there should be room for one 6 ft. to 7 ft. long, and more at times, and a sideboard, one or two armchairs, often a couch or settee; and if there is no study, the books of the house and a writing-table will be here also. The room, therefore, should not be too small (as it often is), and in this room in particular it is well to remember that doubling the area will not double the cost of a room. The best aspect for this room is south-east. Where this room is general living-room as well as dining-room, a large bay or transept, making the room "L"-shaped, gives an interesting as well as convenient room. The bay is purely living-room, the other end of the "L" having the fireplace, and may be considered as belonging to each branch of the "L" in turn.

The Drawing-room in small houses should be generally somewhat smaller than the dining-room, and is pleasant if it has the afternoon sun.

A Third Sitting-room is a useful addition, and if on special occasions it can be thrown into connexion with one of the others, so much the better. It serves as a breakfast-room the day the dining-room is "turned out" (in one house I know the hall serves this purpose well, callers being unlikely at so early an hour). Its chief use will vary very much in different houses, as breakfast-room, morning-room, library, and den.

Bedrooms, &c.—Roughly one-third of our

time is spent in bed and, therefore, the bedrooms of the house should have particular care in their planning. An adult should have from 1,200 to 2,500 cubic ft. of air per hour, equal to a room nearly 20 ft. by 13 ft. by 9 ft., therefore the necessity for ensuring the repeated change of air in a room is obvious. Not only an exit flue but an inlet is required. A deep bottom bead on a sash window enables air to enter at the meeting rail. I do not think the casement can be made to give this advantage. Sun also is very essential to keep the room sweet and healthy and should enter early in the day. A bedroom hot in the evening from a setting sun is disliked by most people. If the room is near an internal angle of the building, see that the window is not commanded by one in the return wall. In planning the room, show the principal furniture, the bed, with the light, if possible, from the side and space for a wardrobe. The dressing-table should have the back of the mirror to the window or between the windows if there are two; consideration should also be given to the morning opening of the window without having to move furniture first. In artificially lighting this room one light should be so arranged with regard to the dressing table, that the light falls on the dresser's face and not on the mirror. In a small room, if the bed occupies the position already suggested, this one light will probably serve the whole room. If electric, it is convenient to be able to switch it on and off from either the door or while lying in bed.

Bath, Lavatory, and Water-closet.—In connexion with the bedrooms the bath-room will be much used; in these small houses it assumes a much greater relative importance than in large houses. In addition to the bath there should be a fitted lavatory, both to have hot and cold water (this arrangement means a great saving of labour in the house by lessening the amount of hot and cold water carried to each bedroom, and subsequent removal of slops). Some polished copper hot water rails for airing towels are useful, and help to warm the room. The bath most commonly used has a roll top edge and no casing; this seems to me a great mistake. As a rule, casings should be omitted whenever possible, that every part may be kept clean, but a bath is so big in bulk and has usually to be placed against the wall so that no one can possibly reach over to clean the vertical space between the side of the bath and the wall. The shallow space between the bottom of the bath and the floor is almost as bad. Splashing over of water, often soapy, is inevitable, and the dust clings.

As near as possible to the bathroom should be the upstairs water-closet, but never in it, although one sees illustrations of this. These two apartments seem to be the most difficult of all to arrange; they should be near the bedrooms, since the bathroom partially acts as a dressing-room, yet so retired that persons using the water-closet should not advertise their movements all over the rest of the house, and to this end do not permit any borrowed light from one or the other to a neighbouring passage, and be very careful in the selection of the water-closet apparatus and the water waste preventer that they may be as silent as possible. Next it is most important to remember that a water-closet is not merely an apartment 6 ft. by 4 ft. or thereabouts which may be partitioned off anywhere. It must not be overlooked that it is often 30 ft. high; in other words, the soil-pipe is an essential part of it, and if you place a water-closet on the principal front near or over the entrance door, this soil-pipe and the ventilation pipe which extends it, will spoil the effect of everything. Bath and lavatory wastes are nearly as bad. Over the scullery, or some of the adjacent pantry or kitchen parts, is the natural place; but see that the water-closet is not over the larder—a point to which it always seems to gravitate. All places having water supplied to them should be as near to one another as possible, for economy of pipe work and also because of accidental overflows; a long distance, too, from the kitchen boiler to the bath or lavatory generally means that the circulating pipes have to cross hall or sitting-room; and as few people care to see them exposed here, they get boxed up in floors and other improper and inaccessible places. To sum up this part, the bathroom and water-closet should be regarded as very large, their wastes extending down to the drains, their supply and ventilation pipes go up to the cistern and ridges of roof, and the bath has also a horizontal extension to the kitchen boiler.

The Kitchen, Offices, and Servants' Quarters in small London houses are usually very cramped and deficient—at least, to those like myself who have had some country training first. The points about increase of size should be borne in mind here in particular. The kitchen is also the servants' living-room, and therefore should have as good an outlook as possible, and some sun, preferably in the early morning. Adjoining should be the scullery, primarily intended for the keeping and cleansing of the cooking utensils and the rougher part of the preparation of the food, but many other duties are now thrust on to it. It is the place where nearly all the dirty work of the house is done, such as cleaning boots and knives, trimming lamps, washing up greasy plates and dishes; it is also frequently fitted with a gas stove, and becomes the chief cooking place in hot weather.

It needs a copper for the rougher laundry work that is always done at home, it is also the storage place for brushes and brooms, and we are frequently asked to believe that a space about 6 ft. square is all that is necessary. The larder must be placed so that it can be kept cool and away from the steam of the scullery copper. A lock-up store should be provided, where the lady of the house will keep extra groceries in reserve and where best dinner and other services and glass are kept. An exceedingly useful addition, even in the smallest house, is a china or housemaid's pantry provided with a lead-lined sink. Here tea and breakfast services are washed and stored, also plate and glass. Table-linen is also kept here. By attending to the lighter work here, the mistress and young ladies of the house can assist without interfering with the servants. If planned as an ante-room between the kitchen and main house, it will also act as a ventilated disconnecting lobby, and help to prevent an unavoidable cookery smell extending all over the house.

The Stairs may be made the most picturesque part of the house, but they must be practical also; they will have to be used by the very young and the infirm. Winders are often dangerous, and should never be curved on plan (as they often are at the foot of the stairs) if it is intended to carpet them. Bulky furniture will also have to go up and down and at times a coffin.

The Plan.—The width of the site is the next point that will determine the plan. Narrow sites must make the house one of a row; at 25 ft. it is possible to make it "semi-detached"; 40 ft. to 50 ft. is the least on which the smallest detached house will look well.

The varieties of plan possible are more than, I think, is commonly supposed. In a terrace-house the simplest is to put two rooms on a floor facing the front and back of the site, respectively, a part of one being cut off for the staircase, or the staircase may be put in between them. In these cases the kitchen and offices occupy a basement story, two sitting-rooms on the ground floor, with probably two floors of sleeping-rooms over. Constructively cheap, owing to small amount of foundation and roofing (which the increased thickness of walls will not outweigh). They are very inconvenient, owing to the amount of stairs. There is, of course, three times as much staircase in a four-story house as in one of two stories. The first variation is to bring the kitchen to the ground floor in a wing behind the stairs, with the result that the look-out from one sitting-room is quite spoiled, the scullery or coals enjoying the view. Another arrangement transposes sitting-room and kitchen department, opening the kitchen from the centre of the house. In both these types the getting in and out of coals and dust is a great difficulty unless there is a back way. In the Midlands it is a common practice in small houses of this kind to make a passage at the side common to two houses for this purpose, and as a tradesmen's entrance.

Larger terrace houses are obtained by placing the drawing-room or a study upstairs and an additional floor of bedrooms. If this is done, great care must be taken with the approach. Most of us can probably call to mind examples where the stair is too narrow, and the bath and water-closet department too conspicuous *en route*. All terrace houses are open to many objections—the difficulty of getting sunshine to all rooms has been mentioned, and the difficulty with coals and dust where there is no basement. To these must be added that the drains, with rare exception, must pass under the building, and

the transmission of sound from one house to another is very considerable. Piano playing, singing, the running of children up and down stairs, and even conversation may be heard. As generally planned, the sitting-rooms of different houses have only a thin wall between them, and the front doors of two houses adjoin as at AA. The passage of sound, of course, can be lessened by the arrangement at B, where the rooms have the staircase between, but the cost is greater, there being more brickwork, and the light and air to the centre part of the house is much damaged. In the London district there is also the aesthetic objection, that the party-walls must show above the roof and they are very difficult to treat in a satisfactory way. In many of the London district external walls within 10 ft. of another house have also to have parapets above the roof. These points much affect the design. For example, a series of gables with their ridge over the centre of each house, and parallel to the party-walls, would work out in most distressing and expensive manner wide-fronted terrace houses, i.e., those having two rooms on the front, have not been mentioned, as except on plots very shallow from road to back, or with a sharp fall to the road where the long type is not easily fitted, they are not much in request. The chief advantage of dwelling in a suburban as against living more in town in a terrace or house of equal value lies in having garden or open space around the dwelling and the desirability of this and of access to a wheelbarrow, &c., make the detached or partially detached house a necessity, and the latter, moreover, get us over many of our previous difficulties.

On narrow plots the semi-detached house, very like the terrace house already described. The front doors can, however, be put at the side away from the party-wall and thus secure greater privacy, but this generally requires wider plot. These pairs of symmetrical planned houses seem to me to be among the most unsatisfactory designs ever produced. A symmetrical elevation to the road has a greater pier instead of opening as the central feature and this is usually capped by the end of a parapet of the party-wall, which goes up all sorts of irregular turns so much higher than all the roofs, turrets, dormers, &c., with 4 ft. or so of it. Sooner or later the houses drift into different ownership, and one pair his woodwork white and the other black, and the disaster is complete. The remedy is simple: do not plan a symmetrical pair.

Larger detached and semi-detached houses are so varied in plan they are difficult to classify; a few actual examples were therefore shown on the screen, with some slight comment on each. We give some of the points far as they are intelligible apart from the illustrations.

Terrace house, 20 ft. frontage; ground falls sharply to rear of plot; drawing-room placed at back on first floor and only ten steps above dining-room at entrance level. Kitchen are thus half-basement so far as levels are concerned, but are themselves entirely above ground. Kitchen gets a good look-out.

Semi-detached house; frontage 40 ft. An attempt to get rid of the usual run of houses in this locality with the door in the middle and a room on either side. Here we have a hall 8 ft. wide, sitting-rooms to the south-east, and both to the front as being the most interesting outlook.

House of 33 ft. frontage, showing ingenious arrangement of the back wing. Scullery, larder, coals, &c., are less in height than the principal rooms, and a sort of mezzanine over them is approached from the half-larder up-staircase.

The mezzanine contains bathroom, water-closet, and a good sized linen-room; these return are kept very low, and the servants' bedroom is placed over. This part of the house is, therefore, three floors high against the elsewhere, but the top floor of the wing is or some six steps above the general first floor. This placing of the servants' bedroom would I think, be generally appreciated both by servant and mistress.

Detached house for corner site; frontage 32 ft.; house entered through a large sitting-room hall. An exceptional appearance is given by placing the main cornice of wood at the level of the first floor window-cills, and above this Mansard roof, the upper story being the half in the roof. As the lower slope of the roof commences near the outside edge of the

cornice (top member of which is the rain-water gutter), it is possible to obtain inside a height of 6 ft. before any slope begins, and even then it is 75 deg., the steeper pitch of the Mansard and brickwork being fitted in between the rafters. All the external walls are as solid as usual, 6 ft. from the floor.

A corner site house; principal front of about 70 ft. had excellent view across the Avon. Principal sitting-rooms both face this way, and the entrance was from the side road. Attempt made to keep all the water services together, and to so arrange the bath wastes and soil pipes that they do not disfigure the principal fronts.

Mr. S. Flint Clarkson said he desired to propose a hearty vote of thanks to Messrs. Searles-Wood and Appelbee for their papers. With much that they had said most people would be in agreement, but there were one or two points to which exception could be taken. He objected to Mr. Searles-Wood's theory of proportions, which he thought was impossible of application. In the case of a middle-sized house, for instance, of from 100 ft. to 120 ft. per year, the relative proportions of a few parts only could be suggested, as some parts must have at least a certain area in the smallest house of the kind. Take a house of the above rental for father and mother, four children, and two servants; if the dining-room were represented as 1 (say about 10 ft. by 15 ft. minimum) the drawing-room might be about 1.2; but the morning-room must be at least 1.70 superficial feet, the kitchen 2.70 superficial feet, the scullery at least 0.95 superficial feet, the pantry at least 0.80 superficial feet, and the larder at least 0.60 superficial feet. That was to say, they were not varying to the size of the principal rooms. The principal bedroom might be, in relation to a dining-room of 1, about .9, but each dressing-room must be at least 0.80 superficial feet. The second bedroom might be, in relation to a dining-room of 1, about .8, but each of the bedrooms or the daughters and sons of the household must be at least 1.70 superficial feet and the servants' bedroom the same, and the bathroom and boxroom each at least 0.80 superficial feet. There were frequently only four parts which could have the same relative size in several houses, the sizes of the other parts could not be settled by proportion. If this system of proportion could be carried out, buildings could be designed somewhat on the principle that music was ground out by the barrel-organ, the fingers instead of the brains being used. He did not believe in the possibility of this at all, and he thought it was utterly impossible with the varying needs of many kinds of people that this should be done. In reference to the production of pairs of houses, exactly like, that was partly due to the way towns often came into existence, i.e., by accident. Three people seemed to be responsible for the production and arrangement of suburban towns, viz., the land speculator, the financial agent, and the estate agent. These three personages determined what should be the character of a suburb, and no one else appeared to be approached in the matter. Consequently all manner of shapelessness resulted from the formation of roads in order that more frontage and more money could be obtained. This was a monstrous state of affairs, and some attempt should be made to alter it. He had been greatly impressed by the manner in which Burnhamstead had been laid out on the east as compared with the west and the north. The eastern part had been thought out by one whom they all respected, viz., Mr. Benjamin Ferrey, who cut roads through the pine woods in a rational way, and arranged that buildings should be set back a considerable distance. But across the valley the usual arrangement had been carried out, and there would be found roads going out on the main road and coming back with a loop like a fish-hook, at perhaps a distance of only one hundred yards. As to the duplication of semi-detached houses, the building speculator was chiefly responsible, but architects denounced him by not showing what might be done. As to the question of three stories, this was an extremely difficult thing, when it came to the practical working out of the problem, to determine how to get the proper bedroom accommodation for the ordinary detached house, but strong objection was taken by any occupants to two flights of stairs. What was needed to overcome the difficulty was a larger ground story. In regard to aspect, this was more curiously misapprehended

than the question of aspect for the class of houses under discussion. It was said that, although another aspect might be given to the dining-room, probably the best aspect was the north. He disagreed with that altogether, for the dining-room in a large number of cases was also the living room of a family, and they should get as much sun as possible. He held that the right aspect for it was south-east by south. In regard to the height of rooms, he advocated 10 ft. for the ground story, 9 ft. 6 in. for first floor, and 8 ft. 6 in. for the story above.

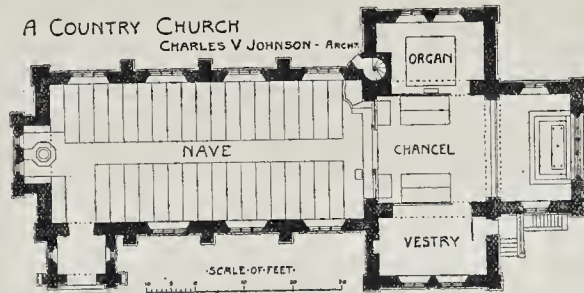
Mr. Henry Lovegrove seconded the vote of thanks and said he did not know how they would define "small," for opinions would differ according to the wealth of owners. The question of the size of drawing-rooms and dining-rooms was often discussed by the ladies of a house; the ladies asked that the drawing-room should be the largest room, for receptions, whereas the master of the house naturally felt that the dining-room was, to middle-class families to a certain extent, not only the dining-room, but the general sitting-room for the family, and he quite agreed with Mr. Clarkson that the best aspect should be chosen for that room. He could not agree with Mr. Searles-Wood about the garden entrance. By all means have the garden entrance if it could be afforded, because people were inclined to come in from the garden without properly wiping their boots, and this in wet weather was very undesirable. The method described by Mr. Searles-Wood of lowering the floor of a billiard-room was a good one, and perhaps the best solution of the difficulty. He quite agreed with Mr. Clarkson as to the height of rooms being 10 ft. for ground floor and 9 ft. 6 in. for first floor, but the question was very much affected by cost, especially now, when bricks and labour cost so much. He would like to ask Mr. Searles-Wood to give them the cost per foot cube of the houses he had referred to. The great drawback to architects designing houses for the middle classes was the cost. An architect might design a house which would cost 1,200 ft., but in an adjoining street a similar house could be built by the speculative builder for 900 ft. or 1,000 ft. As to the double-hung sash, while the casement was externally very picturesque it was extremely inconvenient, for wet and draught could not be kept out when it opened outside, and when it opened inside it interfered sadly with blinds and curtains. He preferred the double-hung sash, especially as it could be made more or less picturesque by showing nearly all the frame and having very stout sash bars. As to water waste preventers, he knew of a case where they had been a nuisance, but the difficulty had been solved by having a piece of pipe fixed on the inlet pipe so that there was no sound when the water flowed, as the pipe was so near the bottom of the water waste preventer. The best place for the bath and water-closet was over the scullery, for the scullery ceiling was not of much importance if anything went wrong with the upstairs arrangements. They would all agree with Mr. Clarkson in wishing that all houses could be built from architects' designs. Scarcely one house in a thousand in the London district was designed by an architect. Houses were all alike in many streets, and they were run up wholesale, for, unfortunately, if decent houses were erected under contract from architects' designs they could not be made to pay.

The Chairman, in putting the vote of thanks to the meeting, said that the subject was a very important one to the younger members of the Association, for he supposed that nine out of every ten architects began their serious work by designing a small house. The more, therefore, the subject were discussed and studied the better for those just entering upon their careers. The field that was open for invention in the design of small houses was practically unlimited, but at the same time the subject was such a familiar one, that there was great risk, especially with young men, of getting into a groove and thinking that there was no possibility of arriving at any new arrangement. With regard to the smaller terrace house, there was not the least doubt that the plan which put the drawing-room in the back wing and the kitchen looking down the narrow alley was a very great advance upon the more usual arrangement; but at the same time there were disadvantages in it. Mr. Appelbee had shown a plan where there was a small back passage between the two houses which served as a tradesman's entrance; that, of course, meant a

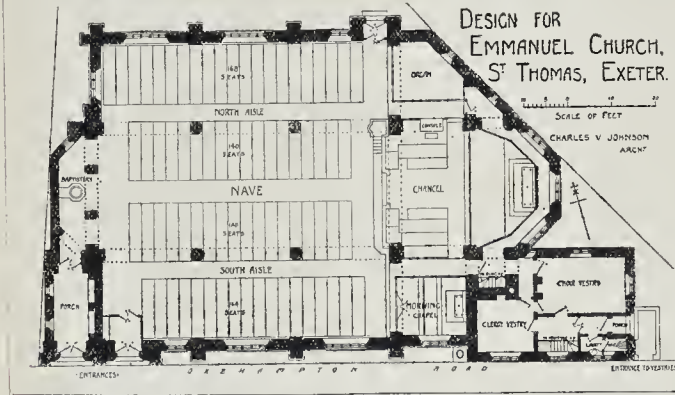
serious defect in that type of house. The drawing-room at the back in that class of house generally became a very long narrow room with a window at the end, and it seemed to him that something might be done to improve the proportions of that room. Mr. Searles-Wood had given them some rules as to proportion, but it seemed a mistake to try and lay down hard-and-fast rules on such a matter, because people had different ideas as to proportions, and it was not desirable to get into a groove. Still, it seemed to him that the drawing-room should be a larger room than the dining-room in most houses, because in the dining-room people sat still, while in the drawing-room they more or less moved about, and wanted more room. He thought the billiard-room should hardly ever have a top light in a private house. As had been said, the room was almost always used at night, and if used on odd occasions in the day time the fittings which lighted the table at night cast an objectionable shadow on the table, and it was a mistake to adopt any other arrangement than that of lighting by windows. If the windows were properly arranged, there ought to be no objection to the side light on account of shadow. The vexed question of casements v. sashes was one on which there would never be any agreement, he was afraid. It was certainly a matter of taste, to a large extent, but in his opinion there were serious defects in sash windows which, from the artistic point of view, it was impossible to overcome. When one was designing in a more or less picturesque style, one very often wanted to have a long low window, and that was absolutely impossible with a sash. There was also a very radical difficulty in a sash, which could not possibly be got over; and that was that the glass in the upper half of the sash was on a very different plane from the glass in the lower half, and that always seemed to be a very objectionable thing. He knew there were difficulties as to cleaning casements and various points of that sort, but he never came across a casement which could not with a little thought be cleaned from the inside. He supposed that every one would agree that pairs of houses should not be absolutely alike. Generally, when they were designed alike, it was merely an excuse for laziness, because it was an easy matter to get a little variety in the design of the two, although they might be planned exclusively on the same lines. With regard to the height of rooms he differed from what had been said by Mr. Clarkson, for he thought that 10 ft. was rather overdoing it in most cases. He would take as a minimum 8 ft., and there were many rooms which looked better 8 ft. than 10 ft. high. It was easier to treat rooms and decorate them when they were kept to rather low proportions. He supposed that the majority of the members of the Association were familiar with one of the prettiest estates round about London, i.e., Bedford Park estate. A study of the plans of some of the houses on that estate, designed by Mr. Norman Shaw, would well repay the time spent, for there was a great deal of originality shown in the arrangement of them, and they were nearly all planned on the most common sense lines, without extravagance. There was a great deal to be learnt from them, and they showed what could be done in the way of variety.

The vote of thanks having been agreed to, Mr. Searles Wood, in reply, said he certainly did not mean to suggest by what he had said as to proportion anything in the nature of a stock article; but it seemed to him that it ought to be borne in mind whether or not, in a design, they were to do something original or commonplace. To a certain extent, if they wanted to be reasonable, they ought to design something that would have a value in the market, in view of the fact that the house was likely to change hands. What he wanted to arrive at for the sake of the man in the street was something in regard to the proportions of rooms, like the multiple photographs of celebrities—half a dozen celebrities being photographed on to one another in order to produce a good common type. As to the prices of the houses, the lower one on plate cost 3,000 ft., and the upper one 1,240 ft. The others were about 2,000 ft. each. As to the height of the rooms, it was rather a pretty feature to make a difference in the height of the rooms. As to the vexed question of casements and sashes, he supposed that most architects knew that a hinge could be got which allowed a casement to be reversed, and that got over the difficulty of cleaning.

A COUNTRY CHURCH
CHARLES V JOHNSON - ARCHT.



DESIGN FOR
EMMANUEL CHURCH,
ST THOMAS, EXETER.



Mr. Appelbee said that if they acted on Mr. Clarkson's advice and gave a south-east by south aspect for the principal rooms, the other side of the house would not get much sun. As he had pointed out, the cost per foot cube was really unreliable, except for houses of almost identical size and shape. Assuming 8d. as the price per foot for the 1,450^{ft}. house he had mentioned, the one with 50 per cent. larger area would be found to work out well under 7d. Reference had been made to water waste preventers which made no noise when they filled; but what about emptying? He would like to know of one silent then.

The Chairman announced that the next meeting would be held on April 19, when Mr. M. A. Green would read a paper on "Eighteenth Century Architecture of Bath," illustrated by lantern views.

The meeting then terminated.

Members' Soirée.

Owing to a variety of circumstances, the Committee has decided this year to postpone the soirée and annual play.

Illustrations.

THE GLASGOW EXHIBITION BUILDINGS.

THESE illustrations are reproduced from sketches made specially for this journal by Mr. Alexander M'Gibbon, Glasgow, whose admirable drawings of the Scottish cathedrals, formerly published in a series in our pages, will be remembered by our readers.

The buildings are described and criticised in the first article of this issue, to which the reader is referred.

SMALL SUBURBAN HOUSES.

THESE sketch plans and elevations of small suburban houses formed a portion of the illustrations to Mr. Searles-Wood's paper on the subject read at the Architectural Association, and reported on another page.

TWO DESIGNS FOR CHURCHES.

A COUNTRY CHURCH.

This church was designed to seat 260 persons in the nave. The walls were to be built

of hammer-dressed squared-coursed rubble, with finely-tooled weatherings, copings, &c., and to be plastered internally for colour decoration. The ceilings of the chancel and the nave were to be of polygonal section, with moulded ribs and plaster panels for decoration in colour. The ceiling in the tower over the choir was to be of oak, with panels formed by moulded ribs. Around the nave a dado was intended, which, with the seating, was to be stained green. The flooring under the seats was to be of pitch pine in narrow widths, and in the gangways, &c., tiled.

DESIGN FOR EMMANUEL CHURCH, EXETER.

THIS design was prepared for and submitted in competition. The requirements were, that the church should seat 600 persons, be capable of being built in sections, and of being easily extended. The design shows a nave with aisles and a chancel, together giving accommodation for 616 persons. A morning chapel and a baptistry are also provided, the latter with a separate approach. Clergy and choir vestries are arranged at the east end of site. In consequence of the low level of the site, special provision was made to exclude flood water. The walls were to be of local red limestone in hammer-dressed squared-coursed rubble, with a 2-in. cavity and an inner 9-in. lining of brickwork. The dressings were to be in Douling stone, finished with a finely dragged surface. The chequered work at the east end was to be in red limestone and Douling stone set alternating. The walls were to be plastered internally; the roofs to be open-timbered, ceiled at collar, with moulded ribs to form panels, and externally covered with tiles. The floor to nave was to be of encaustic tiles, the floor of chancel of marble in 6-in. squares. The cost was estimated at 6,000^l.

C. V. JOHNSON.

THE BUILDING TRADES EXHIBITION.—We are informed that this exhibition, which will open on the 17th inst. at the Royal Agricultural Hall and remain open until the 22nd inst., will be the largest and most representative in point of exhibitors of its kind. Every foot of the ground floor space has been allotted. As already mentioned, special sections are this year being devoted to fire prevention and smoke abatement. Visits to the ball, as in previous years, will be paid by professional institutions interested.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

FORM OF CONDITIONS OF CONTRACT.

THE tenth general meeting of this Institute for the present session was held on Monday last at No. 9, Conduit-street, Mr. E. A. Gruning Vice-President, presiding.

The minutes of the last meeting having been taken as read, Mr. Alex. Graham, Hon. Secretary, announced the death of Mr. Frederick Boreham, who was elected a Associate in 1871.

The following candidates, recommended for election by the Council, were declared elected—Mr. Robert Stephen Ayling, Westminster, as Fellow, and Mr. Norman Thorp Clapham, as Associate.

The Chairman said the next business was to consider the amendments to the Institute form of conditions of contract. As the meeting would be aware, it had been impossible to come to any arrangement with the Institute of Builders on the arbitration clauses which was satisfactory to the members of that body. The Council therefore submitted the amended clauses to the meeting for consideration afterwards they would be remitted to the Council, so that they could be put in proper form for reprint on the contract as it would be issued in future by the Institute alone.

Mr. Maurice B. Adams asked whether Clause 32 was the same as before.

The Chairman: Yes, it is exactly the same. Continuing, the chairman said he thought it would be most convenient if they took the discussion on the clauses *seriatim*, taking Clause 1 first.

Mr. E. T. Hall said he would move the acceptance of the amended Clause 1:—

"1. That the works shall be carried out in accordance with the directions, and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. If the work shown on any such further drawings or detail or necessary to comply with any such instructions, directions, or explanations, be, in the opinion of the contractor, in excess of that comprised in the contract, he shall, before proceeding with such work, give notice in writing to the architect to the effect that he proposes to do so. In the event of the architect and contractor failing to agree as to whether or not there is any excess, and of the architect deciding that the contractor is to carry out the said work, the contractor shall accordingly do so, and the question whether or not there is any excess, and if so the amount thereof, shall, failing agreement, be settled by the arbitrator as provided in Clause 3 and the contractor shall be paid accordingly. The contract drawings and specification shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor."

If carefully studied the clause would be seen to be identical with the previous one, excepting that the latter part, which was the concluding part of the old Clause 12, had been transferred to No. 1, simply because in sequence it came better there than in Clause 12, which dealt with variations. It was practically no change from the present form of conditions.

Mr. Adams said he would be very pleased to second the motion. He thought it would be useful to them if they ascertained why the amendments were put forward, for it was distinctly stated that the Council did not propose them.

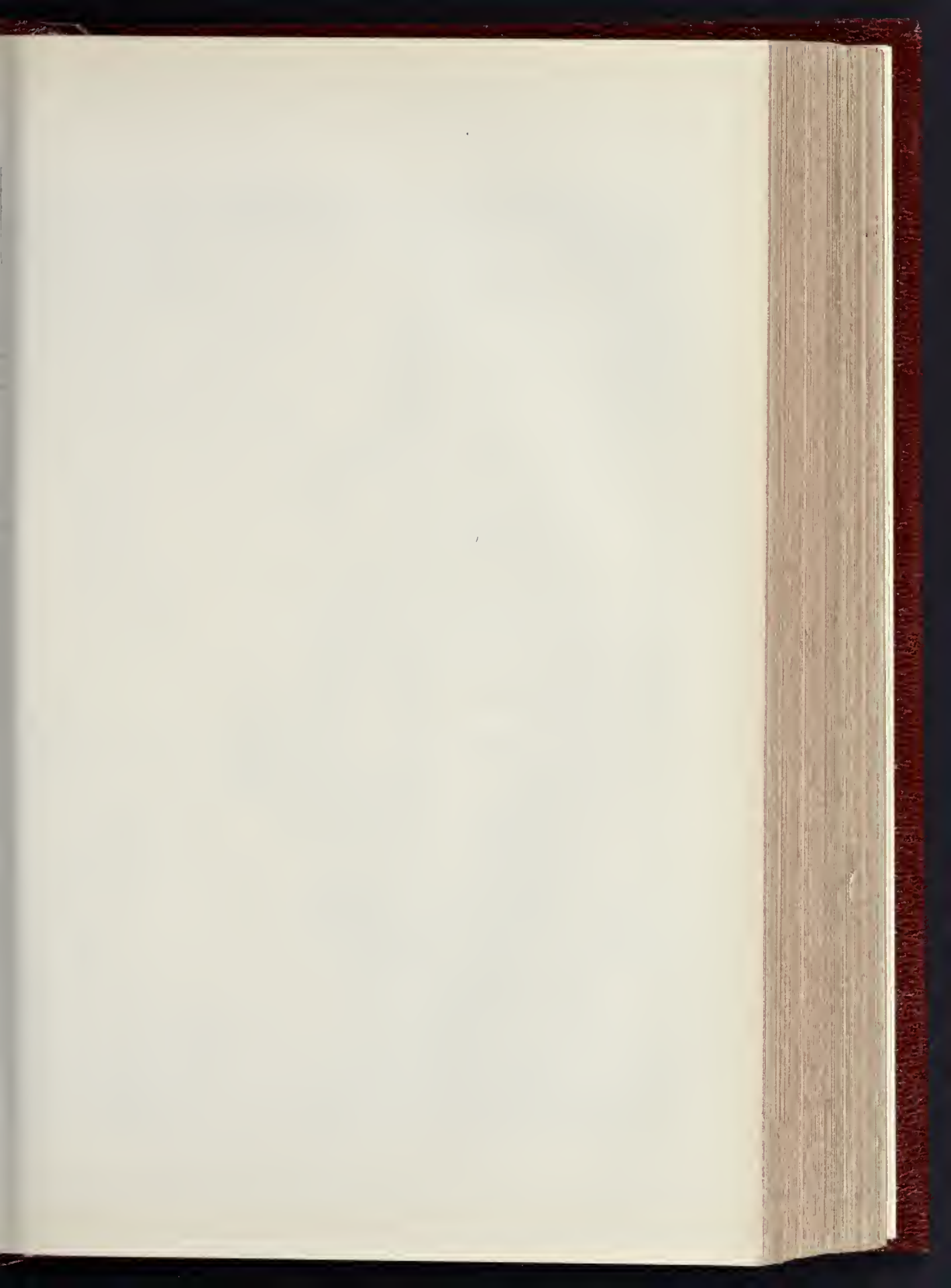
The Chairman said a special meeting of the Council was appointed to see the builders ascertain whether they could not agree upon a joint form of contract. During the discussion it was found that a great many of the clauses would be better amended than altered, and having gone through that amount of work the Council thought they might as well utilise the labour of the committee by putting them before the Institute, and that was how the amendments arose. It was proposed to adopt the clauses so far as regarded their sense, but was not necessary to accept them verbally. That would apply to all the clauses that might be accepted or rejected afterwards.

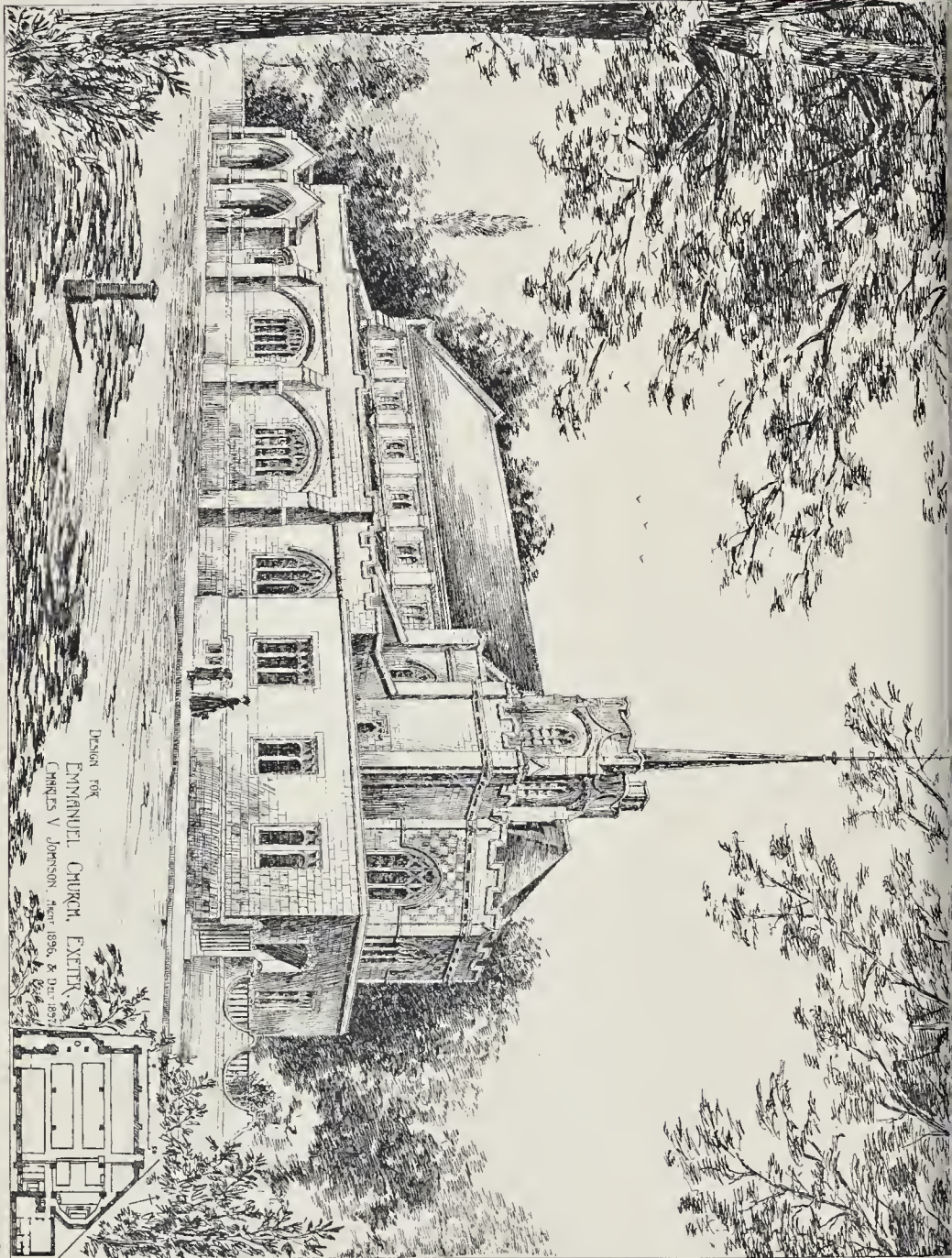
The clause was then agreed to.

Mr. Hall said he would move Clause 12.

"12. The contractor shall, when authorised by the architect, or as provided by Clause 5, vary in any way of extra or omission from the drawings and specification; such authorisation is to be sufficient proved by any writing or drawing given by the architect."

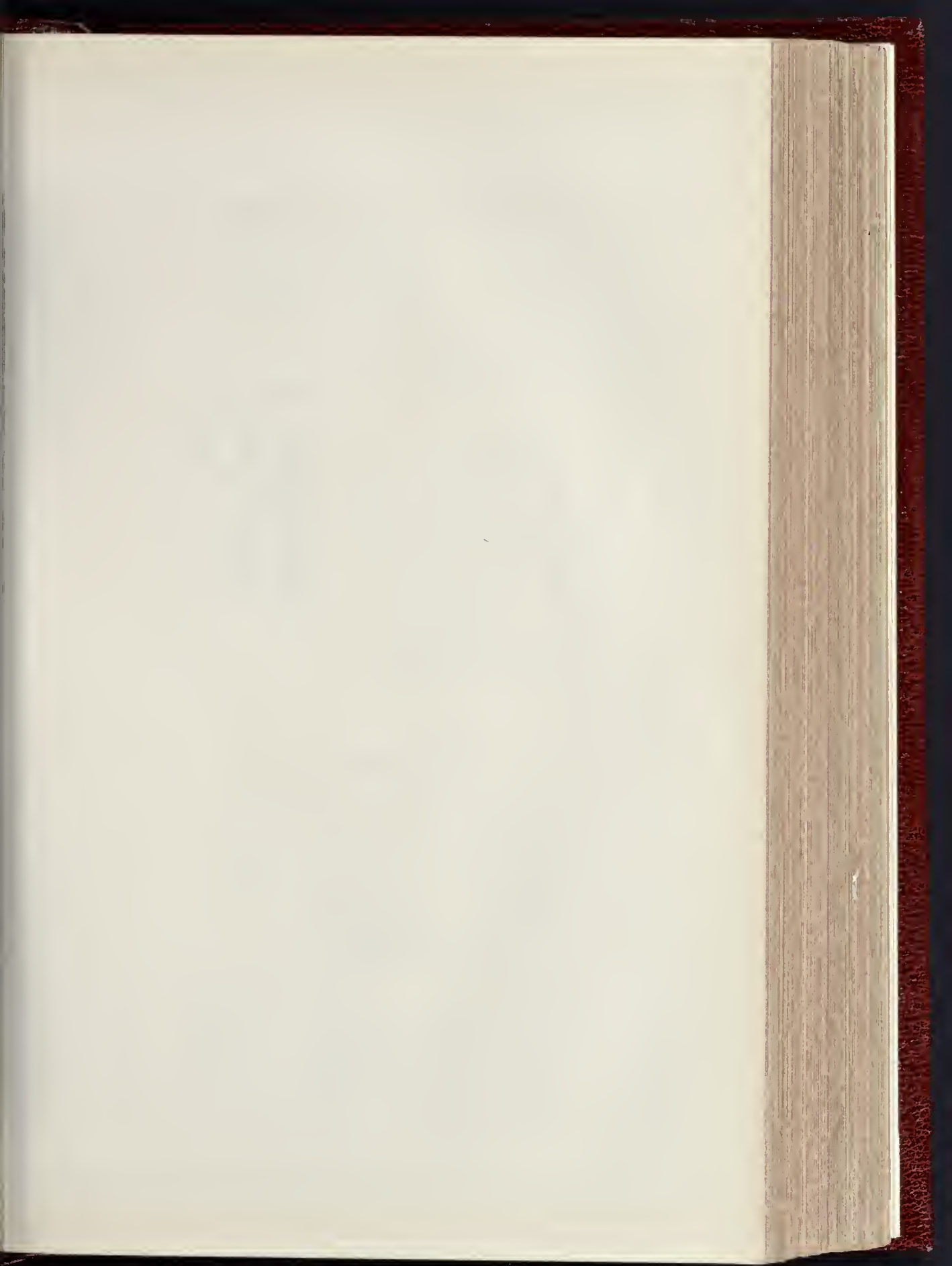
* In our issue for December 8 last we printed the original clauses and the clauses as amended.

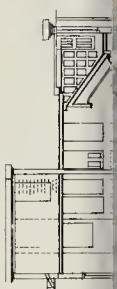




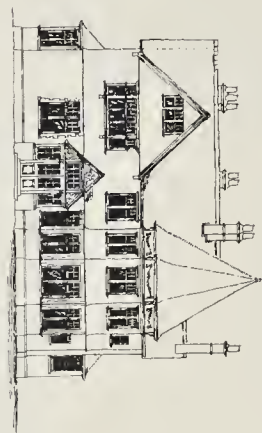
DESIGN FOR
EMMANUEL CHURCH, EXETER,
CHARLES V. JOHNSON, ARCHT. 1896, & DEC. 1897

PHOTO-LITHO. SIMMONDS & CO. 493 EAST HANBURY STREET, LONDON, E.C. 3

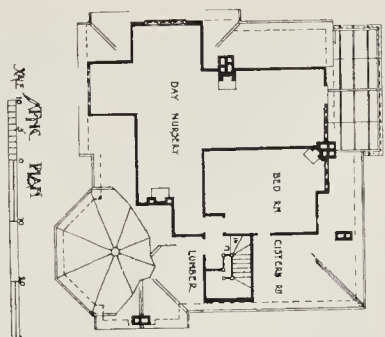




BASEMENT



FRONT ELEVATION



REAR ELEVATION



2ND FLOOR PLAN



GROUND FLOOR PLAN

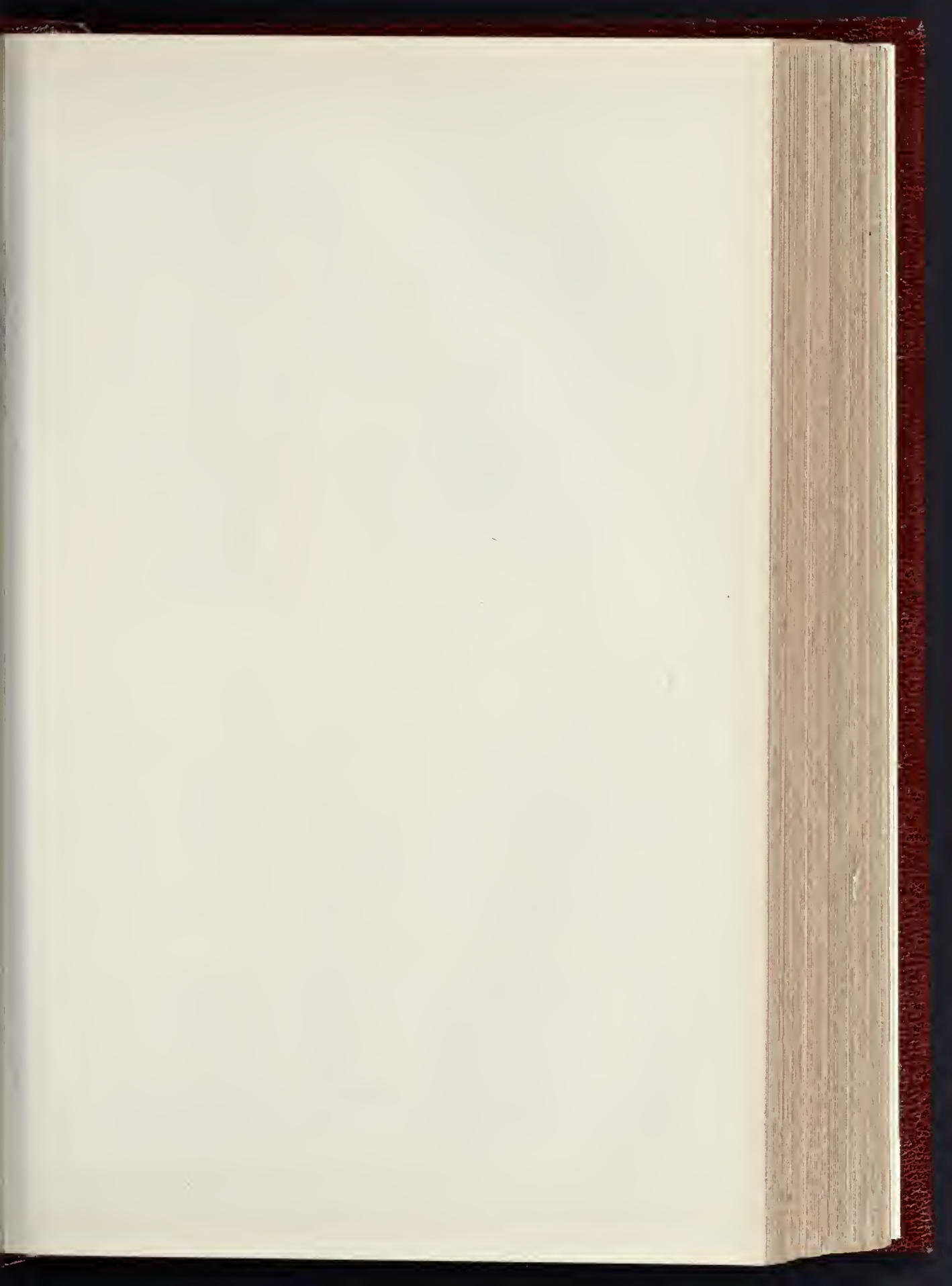


PLAN of STABLE

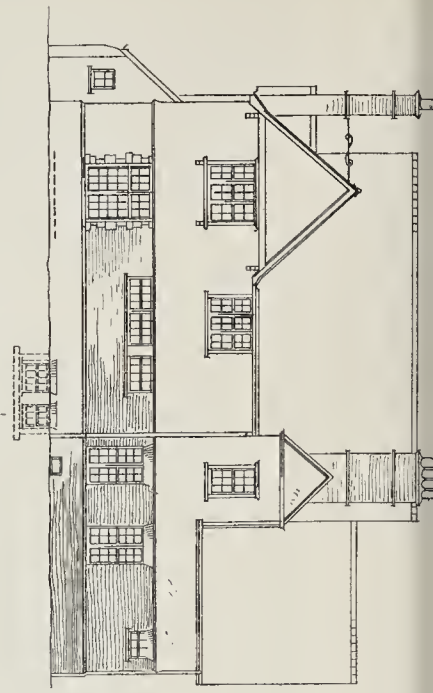
SMALL SUBURBAN HOUSES
 (Illustrations to Mr. Santis-Wood's Paper at the Architectural Association.)

PHOTOGRAPHED BY SPENCER & CO. LTD. 411 EAST WASHINGTON STREET, PITTSBURGH, PA.

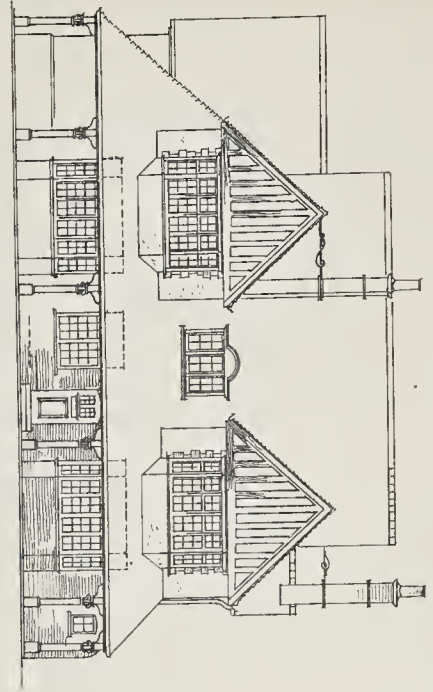
RESIDENTIAL ARCHITECTURE
 1914-1915
 Chicago School, University of Chicago



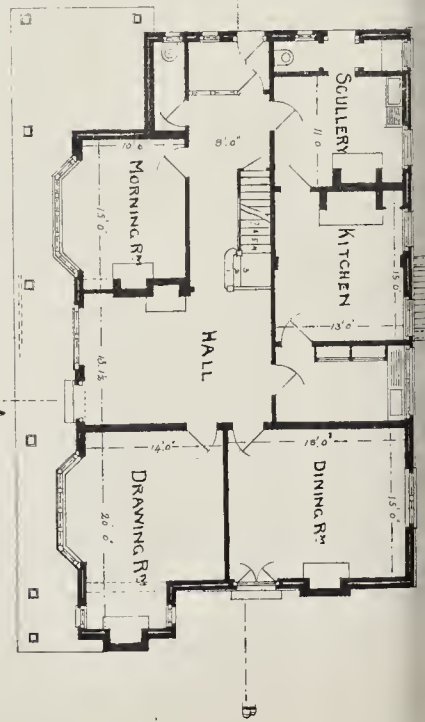
NORTH ELEVATION



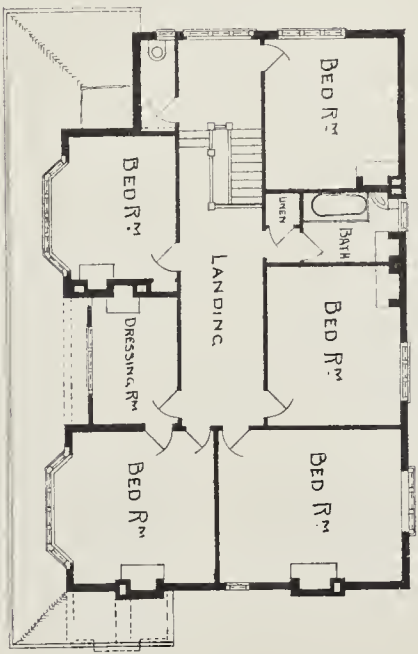
SOUTH ELEVATION



Ground Floor Plan



First Floor Plan

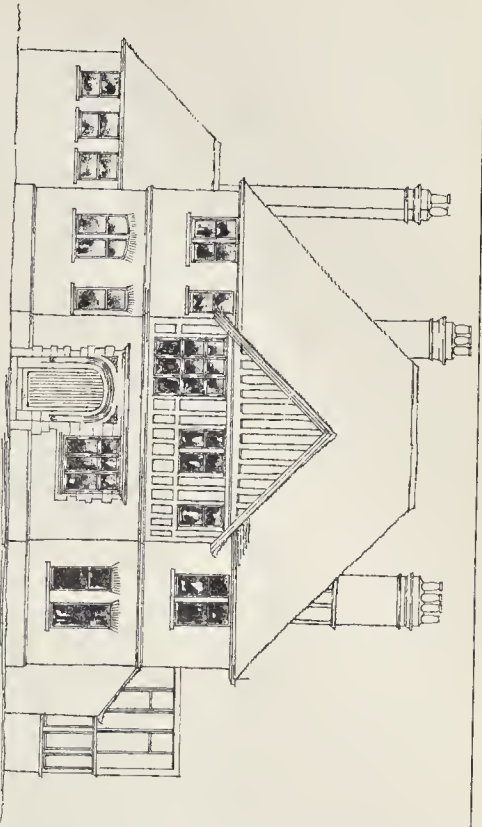


SMALL SUBURBAN HOUSES.
 (Illustrations to Mr. Searles-Woods's Paper at the Architectural Association.)

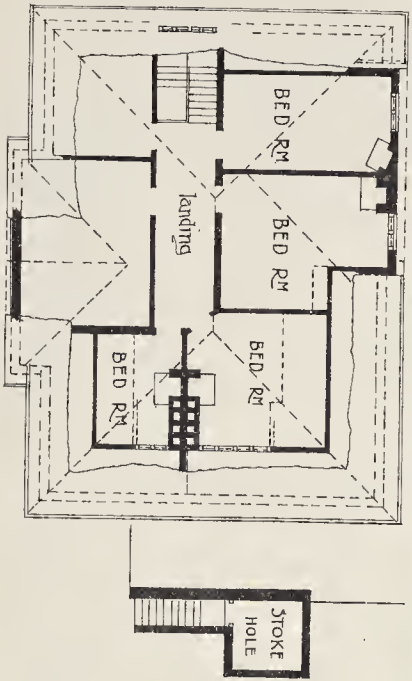
PHOTOGRAPHED BY THE ARCHITECTURAL ASSOCIATION

H.D. SPENCER, ARCHT. & BLDG. ESTIMATOR
 100 WEST MADISON STREET, CHICAGO, ILL.

THE BUILDER, APRIL 6, 1901

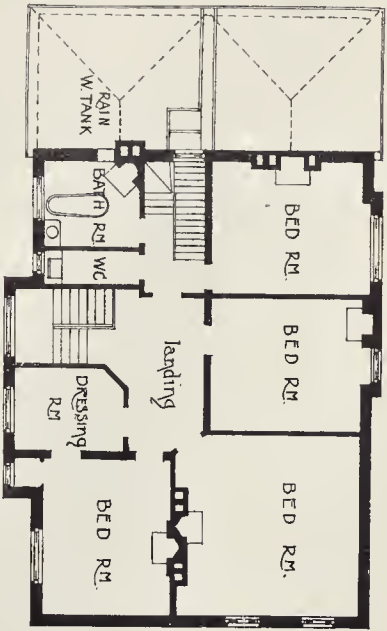


FRONT ELEVATION

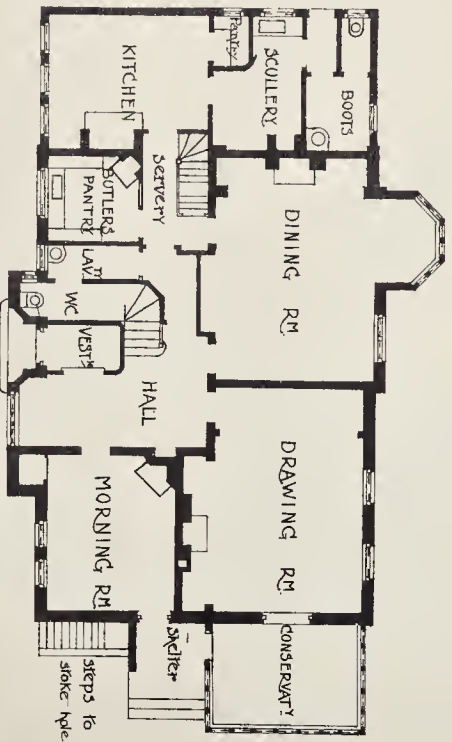


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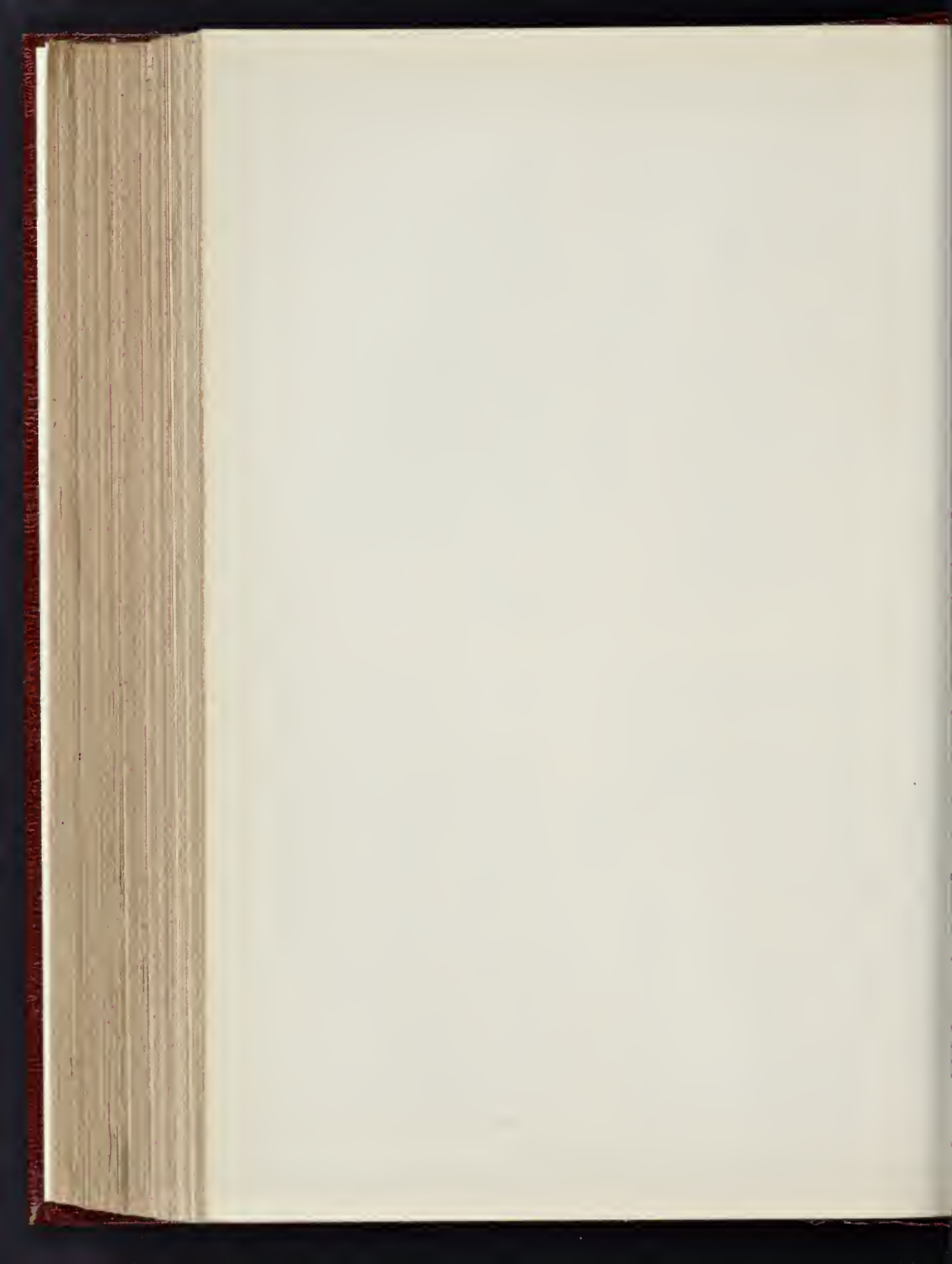


FIRST FLOOR PLAN

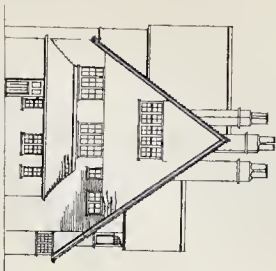


GROUND FLOOR PLAN

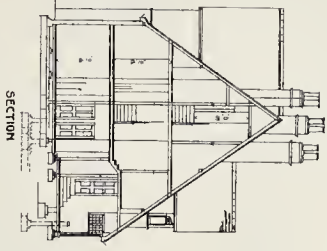
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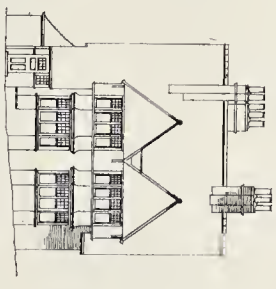
THE BUILDER, APRIL 6, 1901



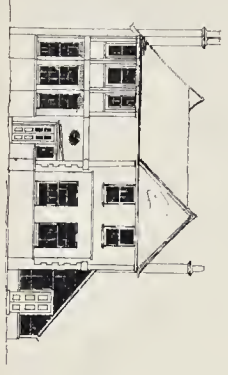
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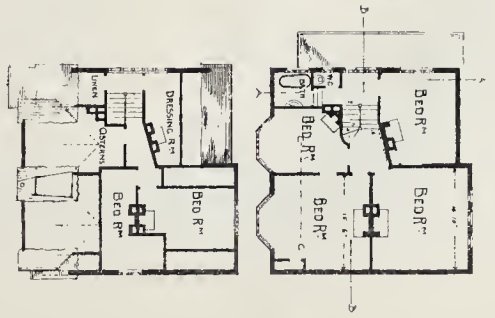
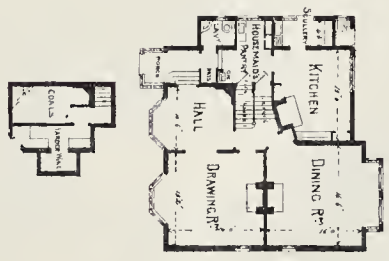
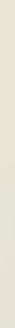
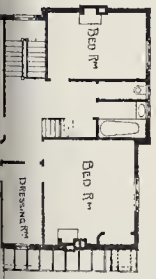
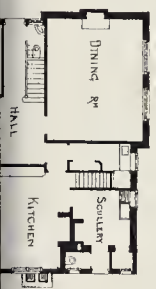
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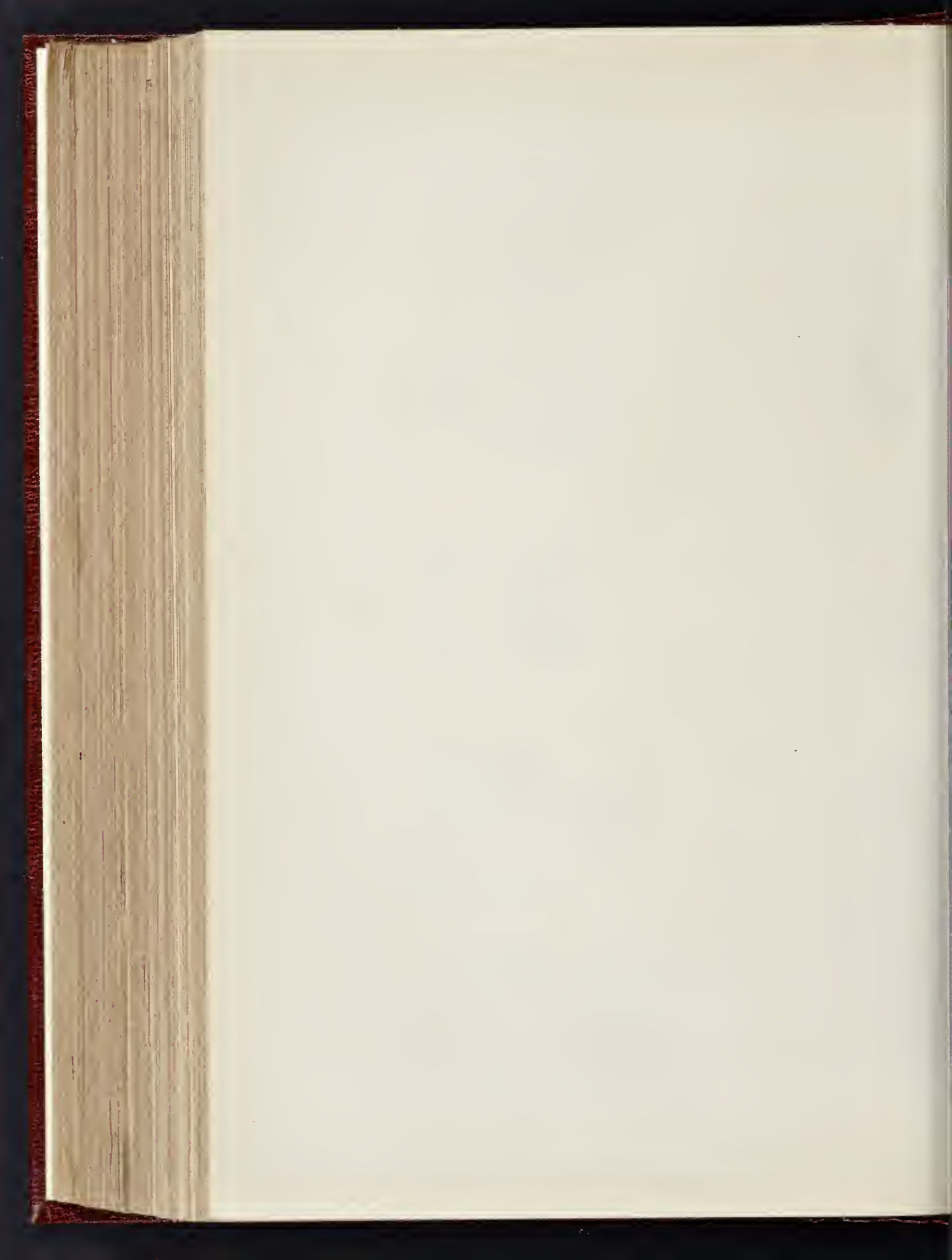


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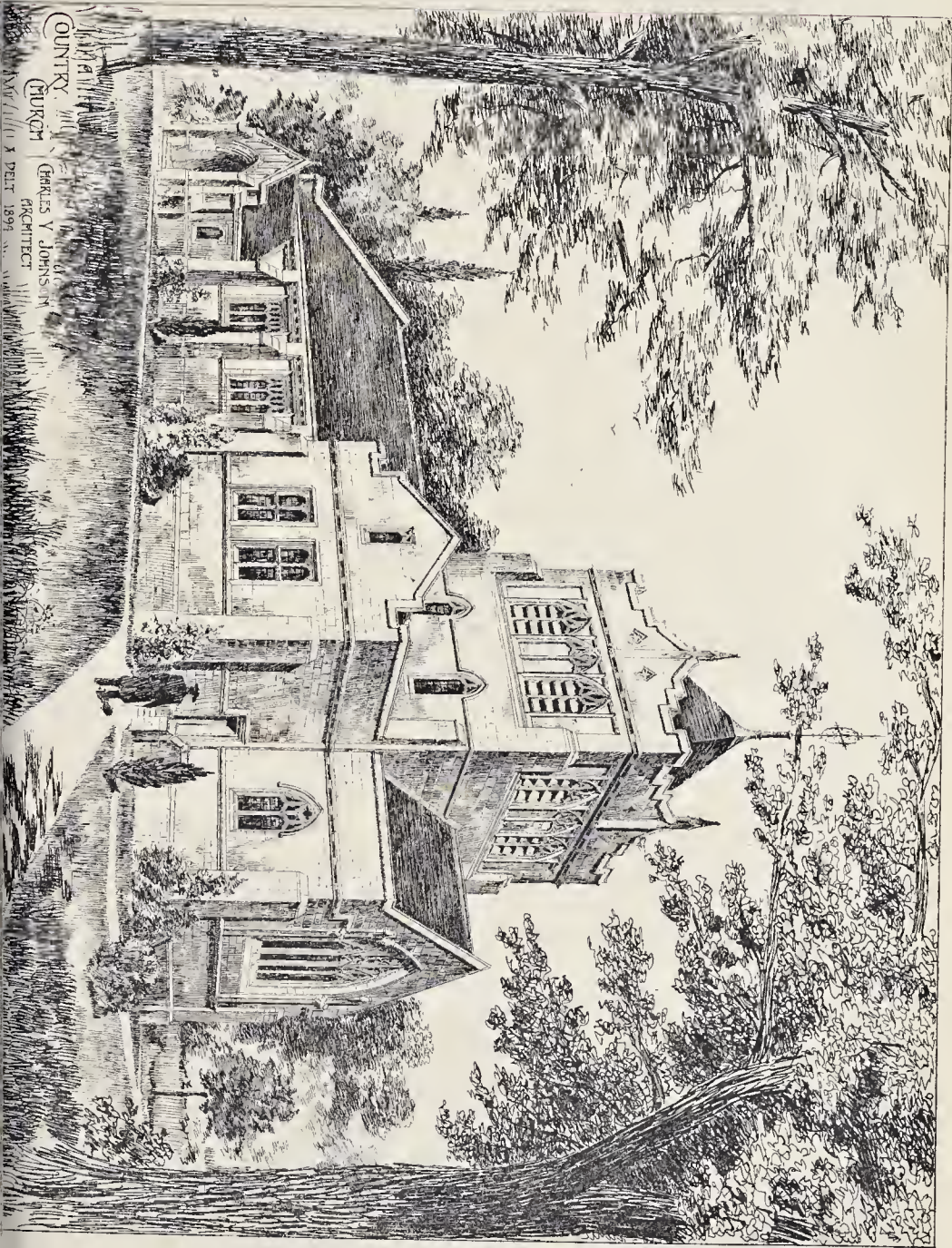


FRONT ELEVATION





THE BUILDER, APRIL 6, 1901



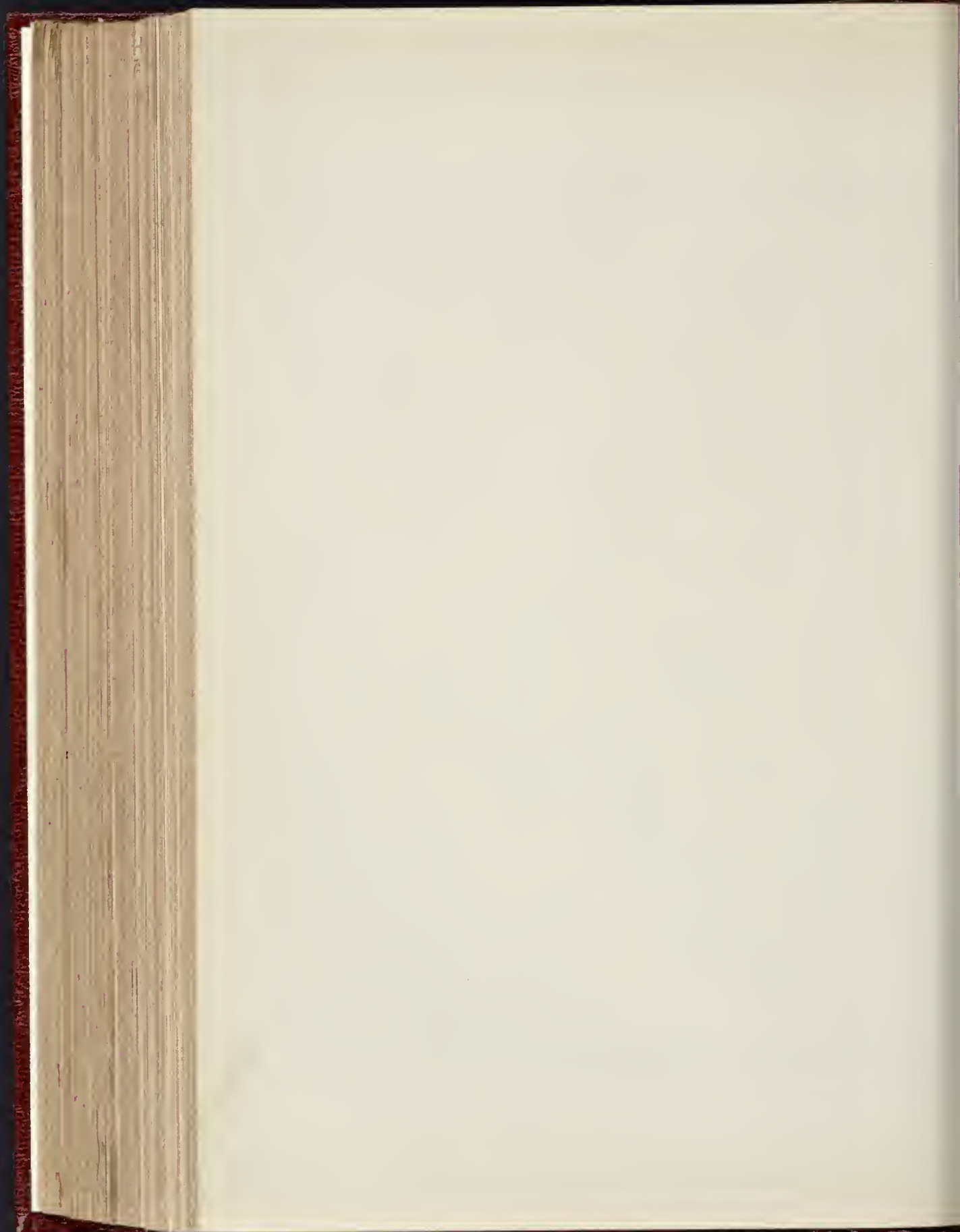
COUNTRY

MURKIN

CHARLES V. JOHNSON

ARCHITECT

NEW YORK DELT 1894



architect, or by any subsequent written approval of him. No claim for an extra shall be allowed unless it shall have been executed under the provisions of Clause 5, or by the authority of the architect as herein mentioned. Any such extra is hereinafter to be as an authorised extra.

The alteration there was this: Under the old Clause 12 it said "the contractor shall not vary from the drawings except by the authority of the architect." One or two solicitors to members of the Institute had drawn attention to the fact that there was nothing in the contract which said that the builders should vary in order of the architect, and it had been said that it was quite possible a builder might refuse to vary at all and that there was no power given to them to compel him to vary. Therefore, instead of it being put in a negative form, it now read that the contractor shall vary. So far as he knew, that was the only difference in Clause 12 and the old Clause 12. He had already explained, the latter part of the old Clause 12 had gone into the new Clause 1.

Mr. H. Hardwicke Langston seconded the acceptance of the clause.

Mr. Brodie said that, on behalf of the Contracts Committee—more or less unofficially because the amended clauses had been issued before the last meeting of his committee took place—he had a slight addition to propose to the clause. Mr. Hall was quite right in saying that attention had been called to the fact that the old conditions there was no power given the architect to compel the carrying out by the builder of extra works. An actual case was brought before his committee, and they reported on it to the Council, and he was glad to see that an alteration in the direction they wished had been proposed. But he did not think it went quite far enough because it only said "that the contractor shall when authorised," and he would propose that the words "instructed or" be inserted there so that the clause should read, "the contractor shall when instructed or authorised by the architect," and that would necessitate the insertion of the words "instruction or" in front of the word "authorisation" here it occurred in the first part of the clause.

Mr. Hall asked what was the difference between "instruction" and "authorise."

Mr. Brodie said a client might give an order which the architect might authorise, because an architect would instruct off his own bat.

Mr. T. E. Colcutt said it seemed to him that the clause as it stood provided for everything they wanted.

The amendment not being seconded, it fell to the ground, and the amended clause was accepted.

Mr. Hall moved Clause 17 as amended, viz.:

"17. Any defects, shrinkage, or other faults which may appear within _____ months from the completion of the works, arising in the opinion of the architect from materials or workmanship not in accordance with the drawings and specification or the instructions of the architect, or any damage or pointing by frost appearing within the like period, shall, upon the directions in writing of the architect, and within such reasonable time as shall be specified therein, be amended and made good by the contractor at his own cost, unless the architect shall decide that he ought to be paid for the same; and in case of default the employer may employ and pay other persons to mend and make good such defects, shrinkage, or other faults or damage, and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the employer, or may be deducted by him from any moneys due or that may become due to the contractor. Should any defective work have been done material supplied by any sub-contractor employed by the works who has been nominated or approved by the architect, the contractor shall be liable to the good in the same manner as if such work or material had been done or supplied by the contractor, and be subject to the provisions of this clause and the preceding clause."

The only change arose in this way. The old Clause read "Should any defective work have been done or material supplied by any sub-contractor or other person employed on the works." The objection the builders raised to this was this. Supposing the employer brought on the works a sub-contractor with whom the head contractor had no relation whatever, was not just that he (the head contractor) could be responsible for anything done by the sub-contractor. They felt that was a perfectly fair objection and, therefore, the words "or other person" were omitted. It, therefore, in

effect meant that if any defective work was done by the chief contractor or any of his sub-contractors—the persons mentioned in the specification—he was to be responsible, but he was not to be responsible if it was done by a person with whom he had no relation whatever.

Mr. Slater seconded the motion.

Mr. Langston said he considered the contractor was placed in a wrong position by the clause. The contractor was made to be liable for the failings of servants not his own.

The Chairman: No; you are mistaken. It is the very object of the amended clause to prevent that.

Mr. Langston: It says, "Should any defective work be done or material supplied by any sub-contractor employed on the works who had been nominated or approved by the architect, the contractor shall be liable." He did not wish to exclude the contractor from his responsibility, but he thought if a contractor was to be liable for work he had not done, as that clause would make him, he ought at least to be a consenting party to the nomination and approval by the architect.

The Chairman pointed out that this was in Clause 20.

Mr. Langston said Clause 20 read, "Who may at any time be nominated, selected, or approved by the architect." That, he contended, was simply forcing a condition on the contractor without the contractor being really a party to the condition.

Mr. Hall remarked that Mr. Langston did not read enough of Clause 20, or he would see that his objection was met.

Mr. Langston said Clause 20 went on to say that no such sub-contractor should be employed against whom the contractor should make what the architect considered a reasonable objection. But it all came to this—Unless they made the contractor a consenting party to the appointment of the nomination of the architect, the words in the clause were not good in English law. The amendment he wished to suggest was that Clause 17 should be linked in some way with Clause 20, and that the contractor should be an approving party of the nomination. The contractor should not have the sub-contractor forced upon him. When the question was before them the last time he remembered some remarks of the chairman to the effect that the contractor, having received or arranged for a profit from the sub-contractor's work, he was then held to be liable as getting such a profit. But there were lots of cases where the contractor did not carry any profit into his tender from such work.

The Chairman: If he does not, that is his own fault.

Mr. Langston said he was aware of that, but he put it to them as practical men, whether it was really not outside common sense for any one individual to be answerable for the faults of the servants of another individual unless he was a consenting party thereto. He was of opinion that it did not in Clause 20 make it emphatic that the contractor was a consenting party. The clause certainly did not want much altering. He would suggest that the words, "With the consent of the contractor," should be inserted in Clause 17, after the sentence, "nominated or approved by the architect."

The Chairman observed that it appeared to him that was provided for in Clause 20. That clause said that no sub-contractor should be employed on the works against whom the contractor should make what the architect considered a reasonable objection. He considered that that perfectly covered the contractor's liability.

Mr. Langston said that in the case of a firm supplying the iron or steel work, or the decoration or plumbing work, what trouble he would have if things went wrong. They had to write to the contractor and the contractor then wrote to the sub-contractor, and nothing was rectified until the clerks got into communication.

The Chairman said that if Mr. Langston would give him his amendment he would put it to the meeting.

Mr. Langston moved that the words "such nomination or approval being consented to by the contractor" be inserted in the clause after the words "approved by the architect."

Mr. E. W. Hudson seconded the amendment.

Mr. Hall said Mr. Langston was talking as if the contractor was asked to be responsible for the work of other persons, but the whole

essence of his condition of contract was that the contractor was responsible for everything in the building. He might have sub-contractors under him, but there was no privity of contract between the employer and sub-contractor. The contract was between the employer and the contractor; it was only ministerially that the architect appointed or suggested or nominated a sub-contractor. The builders had agreed to this, and it would be a most dangerous thing to alter. In fact, if Mr. Langston's suggestion were carried the builder could, if he thought fit, stop the whole contract by refusing to consent to the appointment of a sub-contractor. Let them look what that meant if they had a cantankerous builder, who would simply say, "I will not accept this nomination." If he did that, where were they? The contractor would then accept no liability at all, although he was being paid by the employer to deliver up the building complete within a given time.

Mr. Slater suggested that the whole of the objection of Mr. Langston would be met if they put after the words "approved by the architect," the additional words "subject to Clause 20."

Mr. Brodie thought that if the builders had agreed to the clause they were quite capable of looking after themselves.

Mr. Langston considered it a case where builders required to be protected against themselves.

The Chairman: I do not think there is any need for that at all.

Mr. Langston agreed that the words suggested by Mr. Slater would meet the case, and he was willing to accept them, for he was certain that if the clause remained as it was printed, it would be a continual bone of contention. The builders might have agreed to it—possibly their solicitors had so advised them, seeing that it was a hole made for a quarrel.

Eventually it was agreed that the words "as provided in Clause 20" be inserted after the words "or approved by the architect."

The clause as thus amended was agreed to.

Mr. Hall moved the adoption of the amended Clause 20, as follows:—

"20.—All specialists, merchants, tradesmen, or others executing any work, or supplying any goods for which prime cost prices or provisional sums are included in the specification, who may at any time be nominated, selected, or approved by the architect, are hereby declared to be sub-contractors employed by the contractor; but no such sub-contractor shall be employed upon the works against whom the contractor shall make what the architect considers reasonable objection, or who will not enter into a contract with the contractor upon terms and conditions consistent with those in this contract, and securing the due performance and maintenance of the work supplied or executed by such sub-contractor, and indemnifying the contractor against any claims arising out of the misuse by the sub-contractor or his workmen, of any scaffold erected or plant employed by the contractor, or that may be made against the contractor in consequence of any act, omission, or default of the sub-contractor, his servants or agents, and against any liability under the Workmen's Compensation Act, 1897, or any amendment thereof."

He remarked that the change was radical, but he considered very essential. Unfortunately, he had been professionally engaged in a very heavy lawsuit, and the clause was the outcome of that. The point involved was this: in a large contract of his the builder had, on the advice solely of his legal adviser—there was no dispute before the end of the contract—raised the point of getting damages. The builder took the point that any sub-contractor nominated or approved by the architect, *ipso facto* became the contractor of the employer, and that the builder was absolutely relieved of any responsibility for anything he did; and not only that, but if the sub-contractor caused delay, the employer was liable in damages to the builder for the delay caused, and in the case he had referred to the builder claimed 12,000*l.* for delays by the nominated sub-contractor. In the Division Court he (Mr. Hall) had won the case, and they were now awaiting the decision of the Appeal Court. It was to avoid such a contingency again that the clause was amended, and the Builders' Council had agreed to the alterations. It was contended before the Council of the Builders' Institute that what the amended clause provided was the practice, and the builders assented to that, and therefore the words had been introduced. He considered it most important that the alteration should be made.

Mr. Hudson seconded the motion, and it was carried.

Mr. Slater said he would move the amended Clause 21, which simply brought in the Workmen's Compensation Act. Clause 21 was:—

"21. The contractor shall be responsible for all structural and decorative damage to property, and for injury caused by the works or workmen to persons, animals, or things, and shall hold the employer harmless in respect thereof, and also in respect of any claim made under the Workmen's Compensation Act, 1897, or any amendment thereof, by any person in the employ of the contractor. He shall also be responsible for all injuries caused to the buildings, the subject of this contract, by frost or other inclemency of weather, and shall reinstate all damage caused by the same, and thoroughly complete the whole of the works."

Mr. Adams seconded the motion, and asked whether it might not be well to make the contractor responsible for deficient watching. Of course the contractor put down something for watching, but naturally wanted to minimise things under that head. At the same time many things got damaged by persons intruding on to the premises. He suggested whether perhaps it might not be well to have the words "efficient watching" introduced, although he did not know but what such a contingency was already covered by the form of contract.

The Chairman thought that was rather a matter to be put in the specification.

The amended clause was then carried.

Mr. Hall proposed the adoption of amended Clause 28, viz.:—

"28. The provisional sums mentioned in the specification for materials to be supplied or for work to be performed by special artists or tradesmen, or for other works or fittings to the building, shall be paid and expended at such times and in such amounts and to and in favour of such persons as the architect shall direct, and sums so expended shall be payable by the contractor without discount or deduction, or (without prejudice to any rights of the contractor existing under the contract referred to in Clause No. 20) by the employer to the said artists or tradesmen. The value of works which are executed by the contractor in respect of provisional sums, or in additional works, shall be ascertained as provided by Clause 13. At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen, and the said value of such works executed by the contractor, shall be set against all such provisional sums or any sum provided for additional works, and the balance, after allowing *pro rata* for the contractor's profits at the rates contained in the contractor's original estimate, shall be added to or deducted from the contract sum, provided that, in estimating the amounts paid as last herein provided, no deductions shall be made by or on behalf of the employer in respect of any damages paid by the sub-contractor to the contractor, the intention being that the contractor and not the employer shall have the benefit of any such damages."

In the old clause it said: "At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen," &c. Supposing a contractor entered into a sub-contract and made the sub-contractor liable in damages to him for any breach or undue delay, as the clause was contained in the old form, the employer, and not the contractor, got the benefit of that. But that was not their intention. Their intention was that under such a sub-contract the damages should be paid to, and become the property of, the contractor, and they had endeavoured to give effect to that now. In the old clause, unfortunately, the wording was such that the damages went to benefit the employer. He was not giving his own opinion, but the opinion of judges, and therefore they had endeavoured to correct what was a great hardship to the builder, and a hardship which they—the architects—never intended. The builders had agreed to the change, as it was manifestly in their interests to do so.

Mr. Slater seconded the motion, and it was carried.

Mr. Hall moved Clause 29 as amended, viz.:—

"29. The contractor shall permit the execution of work by any other artists or tradesmen who may be engaged by the employer."

There was a difference, he said, from the old clause which they should very carefully note. In the old form it stated that the contractor should, unless otherwise stated in the specification, provide and erect all necessary scaffolding and plant for the due execution by the artists and tradesmen referred to in the preceding clause of the work entrusted to them. That was now omitted from the clause, for it was held that that was a matter which should

go into the specification. Personally, he thought it would have been better in the clause, but still that was not before them. As long as they did not forget to put it into the specification it would be all right.

Replying to a question by Mr. Adams, the chairman pointed out that if the old clause stood in the contract, how was the builder to estimate the amount of scaffolding to be put up for the sub-contractor of whose work he knew nothing. It was far better that any scaffolding provided for special purposes should be described in the specification than by a general item in the contract.

Mr. Adams then seconded the proposition. Mr. Langston asked if the clause was quite clear. For instance, in the event of the interior being filled up with scaffolding and plant, the architect could permit either artists or tradesmen to go over it.

The Chairman said that really was a matter which must be dealt with in the specification. It was impossible to specify those things in general terms in a clause of the contract.

The proposition was then agreed to. Mr. G. F. Fellowes Prynne moved the rejection of the amended Clause 32, and this was seconded by Mr. Adams and agreed to.

Mr. Prynne then moved the adoption of the old clause, with the figure "16" inserted between "9 and 16," so that the clause should read as follows:—

"32.—Provided always that in case any dispute or difference shall arise between the employer or the architect on his behalf and the contractor, either during the progress of the works or after the determination, abandonment, or breach of the contract, as to the construction of the contract or as to any matter or thing arising thereunder (except as to the matters left to the sole discretion of the architect under Clauses 4, 9, 16, and 10, and the exercise by him under Clause 18 of the right to have any work opened up), or as to the withholding by the architect of any certificate to which the contractors may claim to be entitled, then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of

or, in the event of his death or unwillingness or inability to act, of

his death or unwillingness or inability to act, of a person to be appointed on the request of either party by the president for the time being of the Royal Institute of British Architects, and the award of such arbitrator shall be final and binding on the parties. Such reference, except on the question of certificate, shall not be opened until after the completion or alleged completion of the works, unless with the written consent of the employer or architect and the contractor. The arbitrator shall have power to open up, review, and revise any certificate, opinion, decision, requisition, or notice, save in regard to the said matters expressly excepted above, and to determine all matters in dispute which shall be submitted to him, and of which notice shall have been given as aforesaid, in the same manner as if no such certificate, opinion, decision, requisition, or notice had been given. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act, 1889."

He considered that the suggestion in the amended clause which made it possible for the contractor to call for an arbitration was a most dangerous thing. The architect was often now placed in a difficult position, and what would it be if the builder at any time was dissatisfied and could call for an arbitration in the middle of the work? Then again the architect's position would be entirely undermined. Say that an architect condemned a certain amount of timber, and the builder then and there demanded an arbitration! It was extremely difficult in the country to get an arbitrator down at a moment's notice to arbitrate on the timber, and it would cause certain delay; but besides that, the arbitrator might have a certain difference of opinion as to the material which the architect was using or condemned, and the arbitration might go against the architect, however experienced he might be. In that case the position of the architect would be entirely weakened in the eyes of his client. A man might be an excellent arbitrator, but he might not be a judge of material in the same way as an experienced architect would judge. Another point was that the

builders would accept any condition they put if the architects would accept this point, for the one aim of the builders was to get an arbitration on materials. But, on the other hand, the present power of the architect was practical, the only power he possessed under the contract. It had been said that there were architects who condemned viciously, but he thought they were very few and far between, and they as a Institute could not provide a contract which would satisfy the requirements of men who were thoroughly experienced or vicious in character. Their idea was to keep that which they believed to be fair for men thoroughly experienced in their professional work, and they could not undertake to draw up conditions for those who were incompetent or vicious.

At the request of Mr. Hall, the Clause 10 giving the architect power to condemn material, was read.

Mr. Hudson remarked that that certainly ought to be included.

Mr. Hall said the admission of the reference to Clause 16 in the Clause 32 would involve some alteration in Clause 16. At the end of Clause 16 it said: "And in respect of a matters hereunder the architect's decision shall be final."

The Chairman said that was very possible, but in need not be discussed now, as it would come up again.

The clause as amended was then adopted.

Mr. Pryce Cuxson said he would like to suggest an amendment in Clause 13 in regard to that portion which provided that "a copy of such measurements and valuation shall be given to the contractor." Those words had frequently cropped up in his practice as a surveyor, and they had sometimes been attempted to be construed to mean that the contractor had power to call upon the surveyor to furnish a copy of his dimensions. He did not believe that those who framed the clause had any such intention, but yet when read very carefully was quite capable of that interpretation. Moreover, he believed he was correct in saying that it was not the usual practice for quantity surveyors in London to supply contractors with copy of the variation account unless they paid the cost of copying such bill.

The Chairman said he must stop the discussion of that matter, which was simply a question of practice between surveyors and builders.

Mr. Hall said he believed that Mr. Pryce Cuxson wished to suggest that the words should be "a copy of the bill" instead of a copy of the measurements.

Mr. Brodie said he would strongly support the suggestion of Mr. Pryce Cuxson that the words should read "and a copy of the bill of such measurement and valuation be given to the contractor," because that was what he meant.

Mr. Pryce Cuxson said he also wanted to add the words after contractor "prepared by him."

The Chairman said he could not accept that addition because he did not think they had any power to deal with the quantity surveyor and the builder.

Mr. Adams said he thought if they put quantity surveyors down, they should put down what they should do. He had had precisely the same difficulty brought before him.

The Chairman: I have no objection to you saying what they shall do, but I have an objection to your saying anything about the payment between the builder and quantity surveyor, therefore he refused to put the amendment in the form in which Mr. Pryce Cuxson had moved it.

Mr. Slater said he did not think there could be the slightest objection to altering the words so that it should read "a bill or statement," and if that would be an improvement in the contract by all means let them have it.

Mr. Hall said that after all was said and done they were imposing something on the surveyor by the clause. They were saying that under the contract he was bound to supply and, of course, in that contract must bound without payment. He thought the words "bill or statement" met the difficulty.

The Chairman: I have no objection whatever to take that.

After some further discussion the clause was amended so as to read: "and a copy of bill or statement and valuation shall be given to the contractor."

The Chairman announced that the Council would bring up an amended draft at a special meeting to be held on the 15th inst. H

Further announced that at that special general meeting a recommendation would be considered from the Council that Mr. W. Emerson, resident, be requested to allow himself to be nominated as President for the ensuing year of office, and that, consequently, by-law 26 be suspended. He further announced that the next ordinary general meeting of the Institute would be held on Monday, April 22, when Mr. Francis Bond would read a paper on "The Classification of Romanesque and Gothic Architecture."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE eighth meeting of the Discussion Section of the Architectural Association for this session was held at 50, Great Marlborough-street, W., on the 22nd ult., Mr. C. H. Strange, architect, in the chair. The paper of the evening was entitled, "Lincoln Cathedral," and was by Mr. L. Stanley Crosbie. Mr. Crosbie introduced his subject by a brief examination of the causes, geographical and historical, which led to the foundation of the city and the See, tracing the course of events from the mission of St. Paulinus to the establishment of the See of Sidnacester, the ancient cathedral of which yet stands in the village of Upton, ten miles to the north-west of Lincoln, following on with the account of the removal of the bishop's seat to Dorchester-on-Thames, and then the final foundation of the cathedral of See in Lincoln city by Remigius, the brother of the Norman King, in about 1076. He then gave a short sketch of the evolution of the cathedral, the accidents of war, and earthquake, which caused the wreck of the Norman structure of the first foundation, and then of the second foundation by St. Hugh on the present plan and scale, giving but the west front of the Norman. After summing up the historical section of his paper, Mr. Crosbie proceeded to deal with the more salient points of the structure which would appear to challenge criticism or excite special interest, claiming to regard the Minster in the light of an architectural whole, rather than dealing with the archeological examination of parts. The peculiar beauties of the views and glimpses of the cathedral, both as seen in the air as also in the far distance, and the significant share the hill and the contour of the surrounding country has in the fame of the Minster, were enlarged upon, while at closer quarters the unique west front was criticised in some detail. The author of the paper gave his opinion that while the defects of this church abused front were obvious, and should not be overlooked, there was yet so much to be sought and interest, so vivid a page of history and human effort displayed here, that the chance of worth was entirely in its favour, and in putting on one side for the moment its great breadth of effect and impressive endeavour.

With the aid of photographs and some sketches Mr. Crosbie went on to point out the grouping at the east end, the elaborate and beautiful "Bishop's Door," the Galilee porch, the transcript gables with their famous circular windows, the "Bishop's Eye," and the "Dean's Eye." He also drew attention to the excellent Norman work in the western towers and spires, and after alluding to several items of interest in the external architecture, proceeded to describe the interior, quoting the words of Mr. Penrose, describing the exquisite proportions of the nave, and drawing attention to the comparative smallness of the nave piers, producing so noticeable an effect of lightness and grace. The splendid choir stalls and the far famed angel-choir also received attention. He spoke of the few fine examples of thirteenth century glass yet remaining in the cathedral, and deplored the existence and mention of the ugly glass which forms so serious a disfigurement to the glorious east window. Mr. Crosbie then gave some description of the cloisters, and defended them in the charge of paucity and meanness soon brought against them on the ground that, though undoubtedly small, this was largely remedied for by the suitable proportions of the cloister, as compared with the area of the cloister, and the additional greatness of scale which accrued to the Minster by way of comparison. A few descriptive passages were read to the close and the surrounding build-

ings, notably the palace, the precentory, and the chantry, concluded the paper.

Mr. R. H. Weymouth opened the discussion and proposed a vote of thanks to the author for his paper. Mr. W. H. Seth Smith seconded, and the discussion was continued by Messrs. H. J. Leaning, A. S. Tayler, R. W. Mulready, G. R. C. Harding, C. H. Strange, and W. B. Hopkins.

COMPETITIONS.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.—The plans selected for the new municipal buildings in South Shields were prepared by Mr. Ernest E. Fetch, A.R.I.B.A., 20, John-street, Adelphi, London, W.C.

ADDITIONS TO POLICE COURTS, BRISTOL.—Out of the seventeen sets of drawings sent in competition for the proposed alterations and additions to the Police Courts, Bristol, the designs premiated are those respectively of Mr. Henry Williams, architect, Clare-street, Bristol; and Messrs. Buckland & Farmer, architects, Paradise-street, Birmingham.

ARCHAEOLOGICAL SOCIETIES.

SURREY ARCHAEOLOGICAL SOCIETY.—The forty-sixth annual meeting of this Society was held on Saturday, March 23rd, at the Castle Arch, Guildford, Surrey, to receive the report and balance-sheet of the Council. Viscount Midleton, the President of the Society, occupied the chair, and moved the adoption of the report and statement of accounts of the Society. In fulfilment of the promise made in last year's report, a complete and bound volume of the Society's collections (Vol. XV.) was duly issued to all members not in arrear with their subscriptions. In this volume are valuable papers by Mr. J. Lewis André, Mr. H. E. Malden, M.A., Mr. Mill Stephenson, the Rev. T. S. Cooper, Mr. A. Ridley Bax, Mr. Philip M. Johnston, and Mr. Cecil T. Davis. The catalogue of church plate is, with the exception of certain appendices, now brought to its conclusion by Mr. Cooper. The Council, while it congratulates the members on this evidence of the Society's increased prosperity, and is decided to repeat this policy of issuing a complete volume for the year during the present year, feels that, if the practice is to become permanent, it must still further urgently appeal to them to enlist the interest of their friends in the Society's work, and thus help to obtain new members. Considerable as has been the increase in the number of members during the past two or three years, the Council is persuaded that this number does not yet adequately represent the number of those who are interested in the archeology of the county. The excavations at Waverley Abbey were continued last summer, under the superintendence of the Rev. T. S. Cooper and Mr. Henry Horn-castle, with even more important and satisfactory results than hitherto. Mr. Harold Brakspear has given much valuable time and experience to bear on doubtful and difficult points. The work has been at times very perplexing, owing to the many and unexpected walls and footings found of the Norman abbey mixed up with and sometimes made use of in the later buildings. In the previous year Mr. Brakspear discovered the little presbytery of the Norman church in and forming part of the south transept of the later church planned by William de Brade-water. The long, narrow Norman nave has now been traced below the cloister. The original cloister was at some time considerably enlarged and carried across the cellarium as well as the nave of the first church. The arrangement of the Frater and its pulpit is interesting, as it shows the former to be of two dates at least. The plan of the infirmary hall and kitchen is now clear, and it has become evident that there was no building between this portion of the abbey and the river. Some very interesting features, too, have come to light in the direction of the monks' dormitory. Much of the Norman work here remains, with the south wall on a line with that of the Frater; later the dormitory was extended southwards at a higher level almost to the river bank. At the north end the doorway leading from the cloister and the fine broad steps ascending to the dormitory have been exposed, and close by a winding staircase which probably formed the approach to the treasury. The plan of Brade-water's church also is now nearly complete.

There is still a good deal to be done west of the cellarium, where the guest-houses, the infirmary of the conversi, and possibly a gateway may be looked for. This is of almost greater importance than the work already done, since these buildings of the outer court have never been worked out properly anywhere. Both at Fountains and Furness the remains of them are anything but complete, and at the former it is known there were a number of buildings of which no trace can be found. The Society has therefore the opportunity of adding materially to what is already known of the plan of a Cistercian abbey, an opportunity which may not present itself again. It is much to be hoped that the owner of the site will allow the excavations to be extended. In the event of his doing so, the Council must again appeal for subscriptions to carry to a satisfactory conclusion that which is undoubtedly the most important work the Society has ever taken in hand. Mr. George Martineau has resigned his seat on the Council, and Mr. Frank B. Eastwood, of High Clandon, has been duly elected to fill the vacancy. The Council has also appointed Mr. Thomas Howse, F.L.S., to act as hon. librarian of the Society. The number of members is 383: viz., annual, 289; life, 93; honorary, 1. During the year 27 new members have been elected: viz., annual, 26; and life, 1. By death the Society has lost 8 members: viz., 5 annual and 3 life. By resignation: 4 members. Mr. More-Molyneux seconded the motion, and the report and balance-sheet were adopted unanimously. On the motion of Mr. Garraway Rice, Messrs. F. A. Crisp, F. B. Eastwood, Edwin Freshfield, W. More-Molyneux, Ralph Nevill, Sir F. Pollock, Hart, Colonel John Davis, and Lieut. Colonel W. Marsden were re-elected members of the Council. Viscount Midleton moved the re-election of Mr. M. S. Giuseppe as hon. secretary, with a vote of thanks for his services during the past year, which was adopted. The auditors, Messrs. W. F. Potter and Cecil T. Davis, and the hon. librarian, Mr. T. Howse, were also unanimously re-elected. The meeting closed with a vote of thanks to Lord Middleton for presiding.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening last, Mr. Charles Mason, President, in the chair, a paper was read on "The Production of Metallic Bars and Tubes under Pressure," by Mr. Perry F. Nursey, Past President, who stated that his purpose was to describe the various processes and apparatus employed in the manufacture of bars and tubes by forcing metal through dies by pressure. The primary application of this principle, he observed, was to the manufacture of lead pipes; but before describing the methods of their production he referred to some water-pipes made by the Romans which he inspected at Bath some years since during some excavations in the Roman baths there. They measured about 18 in. wide by 4 in. deep, and were made from a dish strip of lead which constituted the top, whilst a flat strip, having its edges turned up over the edges of the upper strip, formed the bottom. He then referred to the early manufacture of lead pipes, which were made by either drawing or rolling cylinders of lead down to the required diameter on a mandrel which formed the bore. Lead pipes were also made by bending sheet lead over a mandrel and soldering the edges. These unsatisfactory methods were in time superseded by the lead pipe press, in which molten lead is placed in a heated container, and when cooled down to plasticity is forced through a die by hydraulic pressure. By this means, instead of only short lengths of pipes being made, as with the old methods, pipes of any required length are produced. The author described the process of manufacture as he had witnessed it at the Farrington Works of Messrs. Pontifex, in Shoe-lane, London. He then described the improved lead pipe press of Mr. Alexander Wylie, as made by Messrs. Wilson & Sons, of Johnstone, Glasgow, which is a considerable advance upon the ordinary lead pipe press. In the later examples, instead of the container being kept hot by a fire or a ring of gas jets it is jacketed and steam-heated. An important adaptation by Mr. Wylie of this press to the encasing of telegraph cables in lead pipes was next described. Before this press was devised the cable used to be attached

to the core of the pipe-press, and the pipe as produced pushed forwards over it. This method had several drawbacks, the most serious of which was damage to the cable by heat. This was remedied to some extent by passing the pipe through cold water before it reached the cable, but this was insufficient to produce a good result. Another method employed was to make the pipe and draw the cable into it. In Mr. Wylie's press the cable passes horizontally through a core, the process of covering being rapid, continuous, and effective. Turning next to the extrusion process of Mr. Alexander Dick, the inventor of Delta metal, the author stated that by its means all kinds of bars from a simple round wire to complex sections, which it was impossible to roll, and also tubes of any section, were produced by causing metal heated to plasticity to flow through a die under hydraulic pressure. Considerable difficulty had been encountered by Mr. Dick in designing the apparatus in which a metal offering a far higher resistance than lead, and pressed at a far higher temperature than that metal, had to be dealt with. Lead, with its melting point of 620 deg. Fahr., is pressed out at a comparatively low temperature and pressure, whilst in Mr. Dick's process copper and its alloys—far less ductile metals than lead—with their melting points of about 2,000 deg. Fahr., are operated upon at a very high temperature, namely that of plasticity, or about 1,000 deg. Fahr. Mr. Dick's method consists in charging the hot metal into a horizontal container, at the front end of which is the die. Upon hydraulic pressure being applied at the rear end of the container the plastic metal is forced through the die, issuing therefrom either as bars or tubes. The author stated that he had inspected Mr. Dick's highly ingenious apparatus in operation at the Delta Metal Works, Pomeroy-street, New Cross, London, where he had seen it produce both bars and tubes. An important feature in the bars thus produced is that the quality of the metal is greatly improved. It acquires increased density, and is perfectly homogeneous, extruded bars of a given metal giving higher results when tested for tensile strength than rolled bars of the same metal, whilst it works best in the lathe or the screwing machine at speeds twice, and even three times, as great as those employed with ordinary metal. This was shown by the remarkable results of tests made for the author by Alfred Herbert, Limited, of Coventry, in one of their Hexagon Turret lathes.—The paper was well illustrated by drawings of the various machines described, and by specimens of extruded metallic bars and tubes, and the various turned and screwed test pieces.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Batterseth Borough Council 3,615*l.* for building and paving works; Stepney Borough Council, 10,000*l.* for electric light installation; and the Hampstead Borough Council, 4,385*l.* for a dust destructor.

Standing Orders—Contracts.—The General Purposes Committee brought up a report containing the following paragraph:—

"The Council on February 19 last referred it to us to consider and report as to the advisability of amending the standing orders as to contracts in order to provide that the trades to be employed in the more important sections of any works to be carried out under contract should be specified in a schedule to be added to the contract.

The question was raised by the Asylums Committee, and in their report they stated that difficulty had arisen at the Horton Asylum in consequence of the casing and capping in connection with the electric light installation being fixed by workmen of the Amalgamated Society of Carpenters and Joiners claiming that the work should be done by carpenters. The Asylums Committee stated that they had asked the contractors to employ carpenters for this work, but that in the absence of any stipulation in their contract they had declined to do so, and that the Committee were unable to insist upon the contractors complying with their request. To meet similar cases in future, the Committee accordingly made the suggestion that in future it would be well to specify in contracts the trades to be employed in the more important sections of the work for the carrying out of which the contract was entered into. Having carefully considered the question, we are of opinion that it would be

inexpedient to amend the standing orders in the direction referred to. We recommend that the Council do concur in this view."

It was moved by Mr. Dew, seconded by Mr. Taylor, that the paragraph be referred back. After a brief discussion, the amendment was defeated, and the Committee's recommendation was carried.

The Housing Question—Lordship-lane Estate, Tottenham.—A long debate then took place on the following recommendations of the Housing of the Working Classes Committee:—

"(a) That the estimate of 91,500*l.* submitted by the Finance Committee be approved; and that the Council do acquire, under Part III. of the Housing of the Working Classes Act, 1890, and the Housing of the Working Classes Act, 1900, about 225 acres of land at Tottenham, Wood Green, and Edmonton, known as the Lordship-lane estate, at 400*l.* per acre, subject to the Council accepting the areas appearing on the ordnance survey, paying vendors' surveyors' fee, and all expenses of sale and purchase, and taking the land subject to existing tenancies and title.

"(b) That the solicitor be instructed to prepare the necessary agreement, and that the seal of the Council be affixed thereto when ready."

The Committee also submitted a detailed report on the scheme, the greater part of which was printed in our issue for March 2.

The Chairman of the Committee (Mr. Waterlow) having described the scheme, Mr. Peel moved to add the following words:—"On the clear understanding that if the Council does proceed with the buildings, the cottages may be so constructed that the rents demanded should be within the means of the class earning less than 30*s.* a week."

Mr. Williams seconded, but the amendment was defeated, and the Committee's recommendations were agreed to.

Lot's-road Pumping Station.—The Drainage Committee recommended, and it was agreed, after discussion,

"That the estimate of 15,000*l.* submitted by the Finance Committee be approved; that the erection of the engine-house and other buildings, as well as the execution of the remainder of the underground work on the site of the proposed new pumping station at Lot's-road, Chelsea, be carried out without the intervention of the contractor in accordance with the drawings prepared by the engineer; and that the drawings, specification and estimate of 35,300*l.* be accordingly referred to the manager of works for the purpose."

Line of Frontage—Sorting Office, Brixton.—The Building Act Committee brought up a report containing the following paragraph:—

"We have been in communication with H.M. Office of Works with reference to the frontage of a proposed post-office sorting-office on a site at the rear of No. 322, Brixton-road, Stockwell, fronting on Wynne-road. Section 202 of the London Building Act, 1894, exempts from the provisions of the London Building Act, 1894, any building, structure, or work vested in, or in the occupation of, any department of His Majesty's Government; and therefore the Council has no power to require that the line of frontage should be kept. In October, 1898, we received a communication from the Post-office calling attention to the purchase of the site, and stating that although the Postmaster-General would not desire to adopt a building line contrary to the wishes of the Council, yet that in the present case, in order to provide sufficient accommodation, it would be necessary to build up to the pavement in Wynne-road. After negotiations, however, with His Majesty's Office of Works, that department has submitted a plan showing the setting back of the front of the proposed building about 5 ft. from the inside of the pavement on the south side of Wynne-road. The general line of buildings on the south side of the road is well defined, and is set back 8 ft. 6 in. from the public way. Having regard to all the circumstances, we have accepted the proposal, which we consider satisfactory, and we report the facts for the information of the Council."

Ground Plan and Annual Map of London.—The Corporate Property Committee recommended, and it was agreed,—

"That, subject to the passing of the annual maintenance votes, the further expenditure be authorised of the sums included in the Corporate Property Committee's estimate, viz., 600*l.* and 500*l.*, and of the sum included in the Local Government Committee's estimate, viz., 530*l.*, during the year ending March 31, 1902, in connexion with the ownership, and detail-sections of ground plan of London and of the annual map of London respectively."

Christ's Hospital.—The Historical Records and Buildings Committee stated that they had given consideration to proposals contained in the Bill now before Parliament with reference

to Christ's Hospital, Newgate-street. They felt that the entire removal of the buildings on the area would result in the demolition of several features of distinct historical and antiquarian interest. This would be an undoubted loss to London, and they have asked the Parliamentary Committee to take steps to oppose the Bill.

Buildings of Historical or Architectural Interest.—The same Committee recommended, and it was agreed, that the first part of register of buildings of historical or architectural interest in London be placed on sale at 10*s.* 6*d.* per copy.

Holborn to the Strand—Paving, &c., near St. Clement Danes Church.—The Improvements Committee recommended, and it was agreed, that the working drawings, specification, and estimate of the cost (6,202*l.*) of the paving and other works in the Strand near the churches of St. Clement Danes and of St. Mary-le-Strand be referred to the Works Manager with a view to the work being carried out without the intervention of a contractor, it being understood that the work around St. Clement Danes be proceeded with by night and day.

Carr's Restaurant.—The same Committee recommended, and it was agreed,

"That, in connexion with the Holborn to Strand improvement, the approval of the Council be given to the action of the Improvements Committee (a) in approving the design No. 3 submitted to the Improvements Committee on March 27, 1901, by Mr. George Cox for the elevation of the new Carr's restaurant on the north-eastern frontage of the proposed crescent road close to the Law Courts; and (b) in extending the period during which Mr. Cox is permitted to retain possession of the land referred to in Section 47, Sub-Section 3, of the London County Council (Improvements) Act, 1899."

Sewer Work.—On the recommendation of the Main Drainage Committee, it was agreed that subject to the passing of the annual maintenance votes for 1901-2, the expenditure of 6,450*l.* be sanctioned for the execution of repairs to the Ravensbourne and Sydenham sewer between Loampit Vale and Catford Bridge, and that the work be carried out by the Works Department as a jobbing work.

Tender.—On the recommendation of the Public Control Committee, it was agreed that the tender of Messrs. Parkinson and W. & B. Cowan, Limited, for the sum of 1,680*l.* for the supply and fixing of plant at the Newington gas-meter testing office be accepted.

New Theatre, Islington.—The Theatres and Music-halls Committee reported that they had considered an application by Mr. F. Matcham, on behalf of Mr. F. W. Purcell, for a certificate under the Metropolitan Management and Buildings Acts Amendment Act, 1878, in respect of a theatre which is proposed to erect in the Holloway-road, Islington, and which will be known as the Marlborough Theatre. The total length of the boundaries of the site is 536 ft. of which 78 ft. will front to Holloway-road, which is 83 ft. in width, with an additional forecourt 58 ft. deep in front of the theatre, 190 ft. to a new footway (Macredy-place) 20 ft. in width, and 78 ft. to a 10-ft. passageway communicating at one end with Macredy-place and at the other with Warlters-road, which is 20 ft. in width. The theatre is planned to accommodate 1,946 persons, and subject to certain conditions the plans may be considered by the Committee, be considered as fulfilling the Council's requirements.

The Council, having transacted other business, adjourned for the Easter recess.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage and Projections.

Greenwich.—The retention of a lavatory and water-closet addition to No. 11, Kidbrook Park-road, Lee, to abut upon Harvey-road (Mr. T. Holl for the Bowater Decorating and Sanitary Company)—Consent.

Dulwich.—Wood and tile pents at the entrance to fourteen houses on the south side of Woodwarde-road, East Dulwich (Messrs. Allen & Hoar for Mr. J. Frampton)—Consent.

Dulwich.—Bay-windows to fourteen houses on the south side of Woodwarde-road, East Dulwich

Messrs. Allen & Hoar for Mr. J. Frampton).—Consent.

Paddington, North.—A one-story porch in front of a proposed parish hall on the east side of Lacroome-road, St. Peter's Park, Paddington (Mr. S. Alder for the Rev. W. P. Legg).—Consent.

Width of Way and Lines of Frontage.

Kensington, South.—A two-story addition to No. 9, Victoria-road, Kensington, to abut upon St. Ivan's-road (Messrs. C. Liney & Sons for Mr. J. Jarvis).—Consent.

St. Pancras, West.—A one-story addition to the Regent's Park Riding School, on the north-east side of Park Village East, Regent's Park, adjoining the York and Albany Hotel (Mr. W. Woodward for Mr. B. Perry).—Consent.

Stam.—The rebuilding of Nos. 35, 36, and 37, King-street, and No. 8, Little Marlborough-street, Oldens-square, St. James's (Mr. A. Burr for Mr. T. Evans).—Consent.

Width of Way and Space at Rear.

Battersea.—Four houses, with shops on the ground floor, on the site of Nos. 148 to 158 (even numbers only, inclusive), Falcon-road, Battersea, with a portion of the northernmost house and the boundary line thereof at less than the prescribed distance from the centre of a passage-way leading from Falcon-road to Clapham Junction, and with irregular open spaces at the rear of such houses (Messrs. Readwell & Martin for Mrs. J. Taverner).—Consent.

Dwellings for the Working Classes.

Kennington.—That the Council do make an order follows:—Whereas Mr. S. Bircham, of Waterloo station, S.E., on the 7th day of March, 1901, under a provision of Section 42 of the London Building Act, 1894, delivered on behalf of the London and South Western Railway Company, at the County Hall, plans of four blocks of intended dwellings, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon street, on the site of Nos. 48 to 72 (even numbers only, inclusive), South Lambeth-road, Kennington, the corner of Miles-street. . . . Now the Council do hereby order that the deposited block plan and block sections, so far as Section 42 of the said Act is concerned.—Agreed.

Alteration to Building.

Dutch.—A box-room in the roof of No. 21, Madella-road, Herve Hill, without the walls of the building being thickened so as to make such walls comply with the first schedule of the Act (Mr. J. J. Christian).—Consent.

GENERAL BUILDING NEWS.

RESTORATION OF ASHTON CHURCH, DEVONIRE.—The parish church at Ashton was re-opened the 16th ult., after partial restoration. The work of restoration was carried out by Mr. Herbert Ad, of Exeter, the architect being Mr. E. C. Nutting, of Marlborough. The wagon-shaped spire and all the timbers, with the exception of part of the moulding of the purlins and principal ribs, which were bidden with lath and plaster, have been renovated. The ribs, purlins, rafters, &c., have been repaired in English oak, and are now exposed. The lead gutter has been recast, and the 6 date 1688 replaced upon it together with the new roof. The outside roofs have been covered with the best Westmorland green slates.

HOSPITAL, ST. ANDREWS, FIFE.—A hospital is to be built on a site at the east end of Abbey Park, St. Andrews. Plans have been prepared by Mr. Charles F. Anderson, St. Andrews.

MISSION CHURCH, BARNSELY.—The foundation of the new mission church of St. Mary Magdalene, at Measbro' Dyke, was laid on the 25th ult. Messrs. Senior & Clegg were the architects.

VOLUNTEER DRILL HALL, BLAYDON, DURHAM.—Drill hall for the 5th Detachment V.B. Durham Infantry was opened at Blaydon on the 27th ult. The hall measures 90 ft. by 40 ft. The contractor was Mr. M. A. Armstrong, of Blaydon. J. M. A. Graham, of Newcastle, is the architect.

EPISCOPAL CHURCH, GUARDBRIDGE, FIFE.—An Episcopal church has been built at Guardbridge in plans by Mr. Charles F. Anderson, St. Andrews.

BUSINESS PREMISES, HAMPTSTEAD-ROAD.—An addition has been made to Messrs. Oetzmann & Co.'s premises at the corner of Hampstead-road and Diamond-street. Mr. Fred. Eales was the architect.

MISSION HALL, BRADFORD.—A mission hall for Methodists is to be erected in Leeds-road, Bradford, in plans by Mr. W. J. Morley, of Bradford. **OSBORNE STORES, EDINBURGH.**—A new bonded warehouse is to be erected at St. Leonard's, from is prepared by Messrs. Leadbetter & Fairley, architects, Edinburgh. The present area is to be leased, and the new premises will extend to an area of 750 ft., with an average width of 70 ft. The eastern portion of the buildings will be occupied by bonded warehouses five floors in height. This

part will measure 304 ft., and will average 65 ft. in width. The northern portion, measuring 245 ft. by 71 ft., will be occupied as cellars, bottle-washing premises, &c., on the ground floor, and the second flat is to be used as the dispatch department. The centre of the building will consist of vatting and mixing cellars, a large covered court, offices for the company and Excise, &c. The elevation to the Queen's Park will be built of stone. The reconstruction of the premises is expected to cost about 25,000.

HOUSES FOR THE WORKING CLASSES, DARLINGTON.—According to the *Darlington Star*, Messrs. Robert Stephenson & Co., Limited, have prepared plans for the erection of 582 houses on land east of the North-Eastern Railway at Thompson-street, adjoining the new engine works, now in course of erection at Darlington. Thompson-street is to be extended eastwards to Salter's-lane, and thereby direct access will be afforded to the villages of Haughton-le-Skerne, Burdon, and Harrowgate. The length of the intended new streets is as follows:—40 ft. wide streets, 3,614 yd.; 80 ft. street, 203 yds.; and the length of 15 ft. wide back streets will be 2,300 yds. Four classes of houses are provided for, viz. 376 with a frontage of 16 ft. each, 116 with a frontage of 18 ft. each, fifty-nine with a frontage of 21 ft., each, and 31 semi-detached cottages, also with a frontage of 21 ft. each cottage. The latter will front the 80-ft. street above referred to, which forms one approach to the works, and which is to be planted with trees to form an avenue. The general plan of this intended addition to the town of Darlington is, first, by an eastward extension of Thompson-street to Salter's-lane, out of which said extension nine streets will be carried southwards for a distance of about 90 yards, and these latter streets will be cut across by other two streets, which will be roughly parallel with Thompson-street extension, the 80-ft. wide avenue being the central one of those running northwards out of Thompson-street extension. Two considerable areas of land, each to be planted round with trees, have been reserved for pleasure or recreation grounds. The accommodation to be provided will be as follows:—First, in the cottages of 16-ft. frontage, sitting-room, with bay window, 11 ft. 6 in. square; kitchen, 15 ft. 3 in. by 12 ft.; scullery (with set pot), 8 ft. 6 in. by 6 ft.; ample pantry accommodation, paved yard, and conveniences. Upstairs, three bedrooms, 15 ft. 3 in. by 11 ft. 6 in., 15 ft. 3 in. by 12 ft., 11 ft. 2 in. by 6 ft., and a bath. In elevation, the roof to bay window is carried across the full frontage of the cottage, supported on ornamental brackets. The entrance is provided with a screen door, glazed in coloured glass. The walls are to be built of light-coloured open clampbricks. The cottage of 18-ft. frontage will have two sitting-rooms (one of them with a bay window), 13 ft. square and 15 ft. by 11 ft. respectively; kitchen 12 ft. by 9 ft.; scullery (with set pot), 9 ft. square; ample pantry accommodation, large paved yard and conveniences. Upstairs, four bedrooms, 13 ft. by 11 ft., 15 ft. by 11 ft., 13 ft. by 9 ft., and 9 ft. by 6 ft. respectively. There is also a bathroom, with lavatory basin, and separate water-closet. In elevation, the screen door is set back from a porch. The eaves are made to overhang on the projecting spars. The roof will be in red tiles. The cottage of 21 ft. frontage will have two bay-windowed sitting-rooms, 16 ft. by 14 ft. and 15 ft. by 13 ft. 4 in.; kitchen, 15 ft. by 11 ft.; scullery, 11 ft. by 8 ft.; good pantry and larder; detached washhouse in yard, which is cemented, leaving spaces for flower borders. Upstairs, two bay-windowed bedrooms, 16 ft. by 13 ft. and 15 ft. by 13 ft.; two smaller bedrooms, 14 ft. 6 in. by 11 ft., and 11 ft. 6 in. by 6 ft. 6 in. There is a bathroom, with lavatory basin, and a separate water-closet. There are two attics, 20 ft. by 10 ft. and 13 ft. by 10 ft. Half way on the roof is a low three-light rectangular window. The semi-detached cottage will have a dining-room 14 ft. 6 in. by 12 ft. 6 in., and a parlour 14 ft. 6 in. square, both bay-windowed; kitchen, 14 ft. by 11 ft.; scullery and pantry, 11 ft. by 8 ft.; also the usual outbuildings, a paved yard, and ornamental flower borders. Upstairs there will be two bay-windowed bedrooms, each 14 ft. 6 in. by 12 ft. 6 in.; a bathroom, lavatory, and water-closet, 11 ft. by 7 ft.; and two attic bedrooms, 14 ft. 6 in. by 12 ft. 6 in. and 8 ft. by 7 ft. 6 in. The elevation consists of four bay windows, two on the ground floor and two above, with the two entrance doors between those on the ground floor. The upper bay windows are each roofed back against an ornamental gable, pierced with ventilating opening, and surmounted by finial. The front wall is brought forward over the entrance doors to form a porch. There are two rectangular roof lights.

BUNGALOWS, &C., MAIDENHEAD.—Building operations are about to be commenced on the Fishery Estate, Maidenhead. The first road parallel to the river is to be at once constructed and an ornamental bridge over the creek erected. Designs for several of the bungalows to be erected on the estate have been prepared by the architects for the estate, Messrs. Palgrave & Co., Westminster, under whose direction the developments are to be carried out.

UNITED METHODIST FREE CHURCH, SHERNHALL-STREET, WALTHAMSTOW.—This church was opened

on the 28th ult. The buildings are erected on a prominent site at the corner of Sherhall-street and Oliver-road, the style being Early Decorated Gothic. The church is flanked on one side by a bold square tower, which rises to a considerable height. A large church parlour is placed alongside the church on the opposite side. The facings are of red brick with Bath stone dressings; the roofs are of green slates; moulded triple arches of Bath stone, supported by Norwegian granite shafts with carved caps, divide the nave from the apse, where the choir and organ are accommodated. The choir has a traceried stone front or dwarf screen. The pulpit occupies the space under the central arch, and is the centre from which all the seating radiates (the seats being circular on plan), so that all the congregation immediately face the preacher. The roof is of hammer-beam construction, with open-timber spandrels of tracery work. The metal work is all of wrought iron and copper. The church will accommodate about 750 persons in a mixed congregation, all on the ground floor. Provision is made for future end gallery to accommodate about 100 persons. The contract was let to Mr. J. P. Carter, Grays, Essex, for 5,600l. The architects whose design was selected in competition are Messrs. George Baines and Reginald Palmer Baines, Clement's Inn, Strand, W.C.

BATH ABBEY RESTORATION SCHEME.—At the Guildhall, Bath, on the 28th ult., a meeting on behalf of the fund for repairing the abbey was held under the chairmanship of the Mayor (Mr. T. B. Silcock). The Rev. Canon Quirk submitted a statement from the Executive Committee, which now reported that the last bit of work on the west front was in hand. But other necessary work had been found, and the architect (Mr. T. G. Jackson) had pointed out the condition of the flying buttresses on the south-east choir, and that the pinnacles and battlements were loose and decayed. The five buttresses on that part of the church were in a bad state. Two of them must be at once completely rebuilt, and the remaining three could only be saved after considerable repair and restoration. He estimated that each buttress would cost 350l., and the various smaller repairs 200l. In addition, a dangerous defect had been found in the wooden roof of the choir, and to strengthen that portion of the church the cost would be 250l. Towards that increased expenditure the committee had in hand a sum of 500l., over and above the liability of previous contracts. It was considered that an additional sum of 2,000l. would be required to meet the cost of the extra necessary repairs. The committee had now decided to appeal to the public at large for 2,000l., with a supplementary estimate of 600l. to carry out the repairs.

FLATS, PUTNEY.—A building is in course of erection at the corner of the Flatt, Lower Richmond-road, Putney, facing the river, and will be called "University-mansions." It will consist of self-contained residential flats of iron and steel construction, and will be fireproof. An electric lift will be erected in the well of the principal staircase and give access to five flats on each floor. The ground floor is to be adapted to shops, the corner being bank premises. Messrs. Palgrave & Co., Westminster, are the architects, and Messrs. Whitehead & Co., Limited, are the general contractors. The cost (with the site) is about 30,000l.

FOREIGN.

FRANCE.—The City Council of Paris has decided on transforming the Hôtel de Lauzun into a museum in which will be placed the curious collection of engravings now at the Carnavalet Museum. The building will be preserved in its existing state, but will be provided with furniture of the seventeenth and eighteenth centuries, so as to form a historical museum of this class of work.—The Government has presented to the "Musée de l'Armée" an important collection of water-colours by Pierre Leconte and Armand Dumaresco, representing the French military uniforms under the First Empire, the Restoration of July, and the Second Empire.—The Académie des Beaux-Arts has elected M. Venturi, archaeologist, of Milan, as its foreign corresponding member, in place of Verdi.

—The Committee of the Louvre has purchased for the gallery an important work by Raeburn.—The church of St. Clothilde, at Reims, recently built from the designs of M. Gosset, has just been formally consecrated.—M. Dailion, the sculptor, has just completed the model for the bronze statue of Pasteur to be erected in the little town of Arbois. M. Debric, the architect, has been commissioned to design the pedestal, which will be decorated with two bas-reliefs in bronze commemorating Pasteur's discoveries, and will be surrounded by a decorative balustrade.—We have to record the death of M. Charles Cazin, an artist distinguished both in figure subjects and landscape. He died at a small town in the Department of the Var, where he had gone to winter for his health. He was suffering from a disease of the heart known to be incurable. Cazin was born in 1841 at Samer. He was entrusted with the commission of completing Puyvis de Chavannes' unfinished frescoes at the Panthéon. At the New Salon Cazin was President of the Section of "Objets d'Art," which in fact owed its initiation to him. He was "Com-

mandeur" in the Legion of Honour, and received a gold medal at the recent International Exhibition. Some further remarks in regard to him are included in the "Letter from Paris" in the present issue.

MISCELLANEOUS.

THE STUDENT'S COLUMN.—Our Student's Column article ("Sanitary Fittings and Plumbing") is unavoidably held over until next week.

LYCH GATE, NORTHMOLTON CHURCH, DEVONSHIRE.—A lych gate has been erected at Northmolt Church. The walls are of local stone, with dressings of Dartmoor granite. The woodwork is of English oak and the roof of tiles. The masonry Southmolt, the oak work being by Messrs. Harry Hems & Sons. The lych gate was designed by Mr. James Crocker, of Exeter.

THE INSTITUTE OF SANITARY ENGINEERS (INCORPORATED).—At a meeting of the Election Committee held on the 13th ult., the following gentlemen were elected as Associates:—F. Eovey, Holloway; J. Buckleide, Hillingdon; J. Whittaker, Fleasington. At the examination in sanitary engineering, held on the 22nd and 23rd ult., the following passed qualifying for Associateship:—W. J. Lane, Croydon; R. J. McKenn, Manchester.

HOUSING SCHEME NEAR BIRMINGHAM.—Mr. George Cadbury has conveyed to trustees an estate of about 350 acres in the parishes of Northfield and King's Norton, in Worcestershire, known as Bourneville, about four miles from Birmingham. It is to be devoted to the purpose of ameliorating "the condition of the working class and labouring population in and around Birmingham and elsewhere, by the provision of improved dwellings, with gardens and open spaces, and by giving them facilities, should the trustees think it desirable to do so, for purchasing or acquiring the necessaries of life, and by such other means as the trustees may in their uncontrolled discretion think fit." About one-third of the estate has already been laid out. Three hundred and seventy cottages have been built, the majority of which are let, but 145 have been sold on terms advantageous to the purchasers. The peculiar feature of Mr. Cadbury's scheme is that the net proceeds of the rent-roll are to be wholly devoted to the extension of the scheme, and that model villages for artisans be multiplied on this automatic principle.

EAST RIDING ANTIQUARIAN SOCIETY.—A meeting of the East Riding Antiquarian Society was held at the Bayle Gate, Bridlington, on the 25th ult., when the Rev. E. Maule Cole read a paper on "Norman Work in Wold Churches." He pointed out, in the first place, that the chalk wolds of the East Riding were but little known, although more of the most beautiful and unique scenery, and greater wealth of all Norman churches, was to be found there than perhaps in any other part of Yorkshire. The period of the eleventh and early part of the twelfth century was a great age for the building of churches. At Cottam he found that only the old Norman font remains, although there was some stone work remarkably well preserved, dating back even to Saxon times. Old Norman remains of churches were also to be found at Cowlam, Driffield, Little Driffield, and Fridaythorpe. At North Grimston Church were to be seen specimens of the most ancient statuary existing in England. The chancel arch of this church was of plain Norman work, but the chief glory of the church was its font, which was very massive and most beautifully carved. Of the eleventh century church at Kirby the tower alone remained, and at Kilham the Norman doorway remained. Of Kirkburn, statements had been made respecting its being erected in 1119, but from a careful consideration of all its features, the rev. gentleman said he did not think it was built before 1150. The speaker went on to say that Weaverthorpe was thoroughly Norman in design. The church at Wetwang he continued, was undergoing careful restoration, and many interesting features were being discovered. He considered this church the oldest on the Wolds—certainly of eleventh century date. There was doubtless an ancient Saxon church here, but there were obviously no remains, as Saxon churches were generally constructed of wood. Of the church at Wharram-le-Street, the tower was almost the only part remaining of the original church, and it was very ancient. In fact, according to the *Builder*, there were reasons for supposing it to be of pre-Conquest date. The chief glory of Wold Newton was the carving over the doorway. The south doorway of Thwing was very interesting, and there were many masons' marks remaining on the outside of Thwing corresponding with Weaverthorpe. No old church on the Wolds had any foundation to speak of except at Thwing, where the foundations were great boulders. In the opinion of the rev. gentleman the churches on the Wolds, so far as there existed remains which might be taken as a criterion, were built in the following relative order:—Last quarter of the eleventh century, Wharram-le-Street and Kirby Grindalthe; first quarter of the twelfth century, Weaverthorpe, Wold Newton, Thwing, Little Driffield, Fridaythorpe, and North Grimston; second quarter of the twelfth century, Wetwang, Kilham, Garton, and

Kirkburn; last quarter of the twelfth century, Great Driffield. The Rev. C. V. Collier, F.S.A., followed with a paper on "Some Curious Papers Relating to Old Bridlington."

BOROUGH SURVEYORSHIP APPOINTMENT.—The question of reappointing officers was considered by the Borough Council, Hammersmith, on Wednesday evening last week. Mr. H. Mair, the present Surveyor, was appointed Borough Surveyor with an increase to his salary of 100l. per annum.

NORTH GATE OF CARDIFF.—Some ten or twelve years ago the late Marquess of Bute obtained the consent of the Cardiff Corporation to rebuild the North Gate of Cardiff, or, as it is sometimes written, the "Senghnydd Gate," on the North-road. What his lordship proposed to do was to reproduce, as far as possible, the structure which existed when Cardiff was a walled town, and from an architectural or antiquarian point of view the gateway would be an interesting monument of the past. Over the archway there was to be a passage leading to the Whitefriars' Abbey and the Castle gardens. The foundations for the gateway were laid, but a dispute with the masons put a stop to the work, and all that can now be seen on the North-road are the hoardings which surround the work on each side of the road. The Cardiff Corporation, having purchased Cathays Park for the erection of a Town Hall, Law Courts, and other public buildings, are anxious that the chief access to that park should not be impeded by a sort of Temple Bar, and they have approached Sir William Thomas Lewis with the object of getting the present Marquess of Bute's sanction to abandon the re-erection of the North Gate.—*Western Mail.*

SOME PROJECTED METROPOLITAN IMPROVEMENTS.—In the course of the current Session the London County Council will apply for leave to introduce their Money Bill to define the amounts which they may expend for various purposes in respect of which capital expenditure is necessary during the financial year beginning on April 1 next, and (on account of the next financial year) during the following six months. Amongst the fresh objects to which the proposed measure relates we may cite the widening and reconstruction of certain county bridges, including Waterloo Bridge; the lighting of Westminster Bridge with electricity; sites and buildings for the Council new given; the establishment of a working epileptic colony at Horton; reformatories for inebriate persons; workshops and technical schools; new main and intercepting sewers; a new pumping station; a service of passenger and parcel boats, with piers and landing places on the Thames; electrical testing plant and a shipping agency in connexion with industrial schools. The Bill extends also to the purchases of property, compensation and rehousing of dispossessed persons, under the Council's various Acts of 1898-1900 in respect of the construction of the Thames Tunnel between Rotherhithe and Ratcliffe (for which an estimate of 846,750l. for the acquisition of property was adopted by them on October 23); an extension of Roebampton-street, Westminster; the widening of York-road, Battersea; Albert Embankment; Mare-street, Hackney (estimate, 669,750l.); Gravel-road, (227,800l.); Archway-road, Highgate (6,000l.); Kenilworth-road (10,450l.); Battersea Rise (46,000l.); Wandsworth-road; High-street and Gardner's-lane, Putney (45,030l.); Nine Elms-lane (171,300l.); St. John-street, Clerkenwell (92,400l.); Southampton-row, Bloomsbury; High-street, Kensington; and elsewhere: together with the rebuilding of the old Gravel-lane, St. George-in-the-East; Rosemary Branch; and Col and Milton, St. George's, and an improvement of St. George's place, Knightsbridge, under their General Powers Act of this current year. In the matter of open spaces the Council seek for powers to acquire the "Brickfield" at Limehouse, to enlarge the present recreation-ground at Newington, to purchase Albert-square, Ratcliffe, and to acquire land for the extension of Brockwell Park at Herne Hill. They further propose to acquire some land at Plumstead with a view to adapting it for purposes of small holdings; to erect more coroners' courts; to remove certain existing gates, bars, and other obstructions in streets; and to obtain powers to expend money "in connexion with historical buildings." We may here add that at their meeting on January 15 the Council agreed to an estimate of 89,000l. for the erection of buildings, &c., to accommodate 100 insane male epileptic patients, with staff, in eight villas and other blocks upon an area of about 127 acres at Horton, and to a supplementary estimate of 96,500l. on behalf of the improvement (on the north side) of High-street, Kensington. They lately agreed to contribute 5,918l. (one-half of the net cost) towards the widening of King-street, Hammersmith, between No. 197 and St. Peter's Boys' School, both properties being included, and 4,300l. (one-third of the net cost) towards the widening of Great Church-lane, between No. 61 and Fulham Palace-road; to widen Central-street, St. Luke's (estimate, 81,250l.); and to widen Mansell-street, as an approach to the Tower Bridge, from High-street, Whitechapel, at a net estimated

cost of 91,100l., including 75,100l. for the property to be taken and 7,500l. for the rehousing of persons displaced.

ELECTRIC LIGHTING, &c., EASTBOURNE.—On the 28th ult. at the Town Hall, Eastbourne, Mr. E. A. Sandford Fawcett held a Local Government Board inquiry into applications by the Eastbourne Town Council for loans of 50,882l. for purposes of electric lighting and 15,500l. for the new Low Level Drive and Park. The consulting electrical engineer, Mr. Hayter, who was unable to attend, was represented by Mr. G. A. Zeden. The Town Council propose to erect new electric lighting works on a site at Roselands.

THE BUILDERS' ACCIDENT INSURANCE, LIMITED.—The twentieth annual general meeting of the Builders' Accident Insurance, Limited, was held at the company's offices, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, March 27, the chairman, Mr. Stanley G. Bird, presiding. The secretary, Mr. R. S. Henshaw, having read the minutes of the last meeting, the following report of the directors and the accounts for the year 1900 were received and adopted:—"The directors have the pleasure to present their report and the accounts for the twelve months ending December, 1900. During the period under review the company has received notice of 1,177 accidents. Although there has been some falling off in the premium income during the year, attributable to various causes, yet the directors are satisfied, from the financial result of the year, that the care which they have exercised in taking and discriminating risks has not been without advantage to the company, which is now in a very satisfactory position. The directors intend to propose certain terms on the renewal of existing policies which will be referred to the members as advantageous to the members and meet with the approval of all insurers. The directors have decided to enlarge the scope of the policy relating to risk of accidents to the public, and also to undertake the driving risk. The remuneration of the directors for the period will, in accordance with the articles of association, be left to the members at the general meeting. The directors regret to record the retirement of Mr. J. C. White from the board in consequence of ill-health. In accordance with the articles of association the following directors retire and are eligible for re-election, namely:—Messrs. T. Barnsley, Woodman Hill, A. Krauss, Wm. Nicholson, and G. H. Trollope." The general business then having been transacted, the meeting terminated with a vote of thanks to the chairman.

HOUSING OF THE WORKING CLASSES, MANCHESTER.—A deputation of the Birmingham City Council visited Manchester recently for the purpose of inspecting the labourers' dwellings erected in this city by the Manchester Corporation, and to confer with the authorities in regard thereto. The visitors were met at the station by the chief of the department, and proceeded at once to the Oldham-road block, consisting of 285 tenements with sixteen shops, the number of persons accommodated therein being 848. The buildings are five stories high, enclosing a large open quadrangle 4,500 square yards in extent. The dwellings on the upper floors are entered from balconies extending round all sides of the quadrangle, which are approached by stone staircases 5 ft. wide in straight flights leading immediately from the street. The tenements are arranged in pairs, and consist principally of two rooms, viz., a living room and a bedroom, 174 sq. ft. and 108 sq. ft. respectively. Tenements of only one room are also provided, the arrangement being about 100 sq. ft. All the rooms are 9 ft. high, and each tenement is provided with a well-ventilated food store and coal-locker. Each pair of two-roomed tenements is entered from a common lobby, and in a convenient place off this lobby a water-closet and sink is provided for joint use. Laundries and spacious drying rooms have been formed in the roof, well lighted and ventilated, and easily approached from the staircases. From Oldham-road the party proceeded to Sanitary-street, where they inspected labourers' dwellings of a different type, for 425 persons, and also Pollard-street, where a further block of buildings has been erected for 448 persons on a similar plan to the first-named block. From there the visitors were taken to the Harrison-street lodging-house for men, which occupies an area of 15,375 square yards, and consists of a building of three stories high. Great interest was shown in the lavatories, wash-house, baths, and lockers which are provided for the lodgers, in addition to boot-cleaning-room, and barbers', tailors', and boot-makers shops, which are at the disposal of the lodgers. There is a large smokeroom 60 ft. by 21 ft., dining-room 55 ft. by 39 ft., reading-room 50 ft. by 28 ft. Adjoining the dining-room are the lodgers' kitchen, scullery, and shop, the latter having communication with dining room and smokeroom by means of serving windows. Dormitories, containing forty-nine cubicles, are situated on the ground floor at the rear of the entrance hall and on the south-east side. The first and second floors are entirely set apart for sleeping accommodation, and each floor contains 157 cubicles 5 ft. wide by 7 ft. 3 in. long, divided by varnished wood partition 6 in. clear of the floor and 3 in. from the ceiling. The space between the ceiling and the top of the screens is filled in with open wire lattice work, thus affording a through current of air along

* The several estimates cited were adopted by the Council at their meeting on October 23 last (see the *Builder* of October 27, 1900.)

dormitory. Each cubicle is provided with a low opening direct into the open air. The dormitories are heated by means of steam radiators at the end of each wing and against the staircases, and ventilated by air trunks taken high each floor and the roof to an exhaust fan fed by electricity. The building is lighted by electricity throughout, and contains accommodation for 253 men, and is within a penny tram of the city.

SOCIETY OF ORDAINED SURVEYORS.—The final examining board of this Society, which has headquarters in Edinburgh, has met on five sessions during the past session. The examiners' final examination, held in February, 1900, tested that one candidate, remitted for examination by the Town Council, had passed the examination, and that the other candidate, remitted for examination by the Sheriff, had failed. The result reported to the Town Council that the candidate remitted by the Council had passed the examination, and the candidate subsequently took oath and signed the bond of caution, the cost of which, in terms of Rule 11, was defrayed by the Council. In the preliminary examination, held in March, 1900, one candidate came forward for re-examination in one subject and succeeded in passing, and two candidates came up for examination, of whom two were exempted altogether from examination on account of their having gained the requisite leaving certificates. One candidate was exempted from examination in two subjects, and one candidate from examination in one subject, and gained leaving certificates in these subjects. The result of the examination was that seven candidates either passed or were exempted from full preliminary examination, and that one candidate failed in three subjects and one in two. The examination, as last year, was conducted by Mr. Robert Robertson, M.A., Headmaster of Ladies' College, Queen-street. For the final examination held in October, 1900, one candidate came forward, remitted by the Town Council for examination. The examiners, Messrs. Lawrie, and Reid, reported that he had failed to pass the examination. For the forthcoming preliminary examination in April, 1901, three candidates have presented themselves, and one candidate has come forward for re-examination in one subject. For the final examination one candidate has come forward for examination and one candidate has failed.

CLERKS' BENEVOLENT INSTITUTION.—The annual general meeting was held on Tuesday 26th ult., when Mr. G. Appleton (of Messrs. Appleton & Appleton), the new President, was introduced by the retiring President, Mr. H. Holloway. Report and balance-sheet for the past year were read, approved, and passed. Special notice taken of the good offices of Mr. Treasurer, Messrs. the hon. auditors, and the hon. solicitors. The institution is now paying annual pensions of £20 to twenty-five builders' clerks' widows, maintaining and educating three orphans, and giving a considerable sum yearly in "temperance relief."

ELECTRIC LIGHTING BOARD SYSTEM.—The "E.L.B." system was demonstrated by the tentatives of the Electric Lighting Boards many before the members of the Royal Institution their meeting on Friday evening last week, and all its latest improvements, including its strips and man-necessaries, were shown. Those present were: Lord Rayleigh, Sir Bramwell, Sir Fredk. Abel, Professor Sylvester Thompson, Professor Dewar, Professor Perry, and their leading scientists.

APPOINTMENT.—The Westminster City Council has granted fifty-six applications for the office of City Engineer and Surveyor, the salary of which is £1,000 a year. At a recent meeting of the Council a resolution was bestowed on Mr. James W. Wetherby, the Borough Engineer of Wolverhampton.

MONUMENTS PRESERVATION SOCIETY.—A meeting of the Executive Committee of the Commons and the Preservation Society was held at 1, Great Street, Westminster, on Monday afternoon, 26th ult. It was reported that a footpath, giving access to Epping Forest near Waverley, had been recently obstructed, and that a right of way, ran from Daws Hill, Stone, past Gilwell Park and Ludgate House Forest, and it afforded the shortest route for passengers between Sewardstone and London, and opened up a very pretty district. It was stated that the Society had collected voluminous evidence, upon which a case was prepared and laid before the Court by Mr. Rawlinson, K.C., and advised that there was a strong *prima facie* case for a right of way. Up to the present, the Waltham Holy Cross Urban District Council had declined to take the necessary steps under the Local Government Act, 1890, to secure section of any public rights which may exist, and resolved, on the motion of Sir Robert Hunter, proposed by Lord Farrer: "That the Commons Preservation Society extremely regrets the refusal of the Waltham Holy Cross Urban District Council to assert the public rights in question of the footpath in question, and expresses its sympathy to give any support in its power to any

local bodies or individuals who may be willing to contest the case." The report of the Board of Agriculture upon application for provisional orders for the regulation of Skipwith Common, Yorks, and the enclosure of Skipwith Common Fields, was considered. It appeared from inquiries made by the Society that the regulation of the Common, 826 acres in extent, would counterbalance the proposed enclosure of the Common Fields, the area of which is 321 acres, and it was decided not to oppose the proposal. A further report of the Board of Agriculture on an application for the enclosure of the heath lands and common fields in the parish of Sutton, Northampton, was also considered. It was stated that if the scheme was adopted 477 acres of common fields and 133 acres of open heath lands would be enclosed, while the only public allotments contemplated 5 acres for recreation and 4 acres for allotments. It was felt that, whatever might be said for the enclosure of the common fields, the heath land should be preserved, or an equivalent area of land allotted, for open space purposes, and it was determined to take such steps in Parliament as might be necessary to endeavour to give effect to the Society's views. The Secretary reported that since the last meeting of the Committee over forty fresh cases had been referred to the Society for advice or assistance.

THE PRESERVATION OF STONEHENGE.—The recent fall of stones on Stonehenge having led to much public discussion, Sir Edmund Antrobus, of Amesbury Abbey, Wiltshire, invited the Society of Antiquaries, the Wiltshire Archaeological Society, and the Society for the Protection of Ancient Buildings to advise him with regard to the better preservation of the famous monument. A committee representing these three bodies met on the 26th ult., under the presidency of Viscount Dillon, the President of the Society of Antiquaries, at which meeting the following resolutions were passed:—"1. That this Committee approves of the suggested protection of Stonehenge by a wire fence not less than 4 ft. high, following by two sides the existing roads, and crossing on the west from the 331-ft. level on the north road to the 332-ft. level on the south road shown on the Ordnance Survey map. 2. That the Committee recommends, without prejudice to any legal question, that the Local Authorities be requested to agree to divert the existing trackway or roadway from Netberavon, now passing through the earth circle, so as to pass from the 302-ft. level to the 331 and 332-ft. levels in the Ordnance Survey map immediately west of Stonehenge. 3. That stones 6 and 7, with their lintel, and stone 56 (according to the numbering on Mr. Petrie's plan) be first examined with a view to maintaining them in a position of safety. 4. That in the opinion of this Committee stone 21 should be replaced, stone 21 be made safe, and the lintel of 21 and 22 be replaced in the most safe and conservative manner. The Committee also recommends the re-erection of stones 57 and 58 and their lintel 158. 5. That the instructions to custodians already in force be approved with a few suggested alterations. 6. That this Committee feels that it is impossible to overstate the value of the assistance which the County Council, the District Council, and the Parish Council of Amesbury can give to the efforts made to preserve this unique monument. 7. That these resolutions be sent to Sir Edmund Antrobus, with the earnest thanks of the Committee, for the part he is proposing to take in the preservation of Stonehenge."—*Standard*.

COUNTY ASYLUM, NAPSBURY, MIDDLESEX.—We read that Mr. Rowland Plumble, architect, has been entrusted with the work of the new County Asylum for Middlesex at Napsbury. There will be no separate buildings to admit of the most perfect classification of the patients.

DEVELOPMENT OF BRIGGATE, LEEDS.—The Leeds Estates Company have just let another contract to Messrs. Armitage & Hodgson, contractors, of Leeds, for the erection of a restaurant, covering an area of about 400 yards, the rebuilding of the Greyhound Hotel in Vicar-lane, and the Dolphin Hotel in Vicar-lane, and the putting up of fourteen shops in King Edward-street, and eleven in the Cross Arcade and Queen Victoria-street. Contracts of the value of between 70,000l. and 80,000l. are also in the hands of Messrs. William Nicholson & Sons.

MEMORIAL WINDOW, ST. MICHAEL'S CHURCH, BUDE.—A stained-glass memorial window has been erected in St. Michael's Church, Bude. It was designed by Mr. G. H. Fellowes Pytne, London.

ELECTRIC LIGHTING, BELFAST.—On the 27th ult., at the Municipal Buildings, Belfast, Mr. P. C. Cowan, M.Inst. C.E., held a Local Government Board inquiry into an application by the Corporation of Belfast for sanction to a loan of 95,000l. for electric lighting purposes. Evidence was given by Mr. McCowan, the Superintendent of the Electrical Department.

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE, COVENTRY.—Mr. Hudson, barrister, who was appointed by the Board of Trade to act in the building trade dispute at Coventry, sat on the 1st inst. Notice had been given by the Master Builders' Association of a reduction of 4d. per hour and shorter hours during the two mid-winter months. The carpenters,

joiners, and painters agreed to arbitration, but not the bricklayers and labourers, who were consequently locked out. Mr. Hudson found that the notice given was bad, being delivered a day too late, and that, therefore, the existing rules would stand.

CARPENTERS' STRIKE, YARMOUTH.—On the 1st inst. the carpenters and bricklayers of Yarmouth struck in consequence of the refusal of the employers to grant an increase in their wages of 1d. per hour.

BURY PAINTERS LOCKED OUT.—On the 30th ult., the dispute in the painting trade in Bury terminated in the men being locked out. Six months ago the men gave notice for a penny advance in wages, the notices expiring on April 1. Meanwhile the masters and men arranged matters so that the men made small concessions regarding the apprentice question and the overtime question, the masters agreeing to grant a halfpenny per hour advance in wages. The difference arose, however, with reference to the time for giving notice, the masters contending for any time. The men holding to the present practice, neither would give way, with the above-mentioned result.

CARPENTERS' STRIKE, DUDLEY.—The carpenters and joiners in Dudley and district came out on strike on the 1st inst., in consequence of the employers calling upon them to submit to a reduction in wages of from 8d. to 8d. an hour.

LEGAL.

UNION LABOURERS' ACTION AGAINST BUILDERS

The cases of Powell v. Handscomb & Smith, and Purkiss v. "Same," came before his Honour Judge Russell, at the Croydon County Court, on Tuesday afternoon, the 26th ult. The plaintiffs were bricklayers' labourers belonging to the Labourers' Union, suing the defendant builders for difference in wages, paid at 6d. per hour, 7d. per hour being demanded. Mr. Gardner, instructed by their Union, appeared for the plaintiffs; and the defendants were represented by Mr. Newnam, under instructions from the Croydon and District Master Builders' Federation.

It appeared that Powell had been engaged on the defendant's works for two weeks and a day and Purkiss for a few days only, both the men being started by the foreman of the job without any specific agreement as to the wages. The foreman gave evidence to the effect that the only time 7d. per hour was mentioned by plaintiffs before dismissal was when Powell approached him with a view to taking on the scaffolding at an increased rate of 3d. per hour. He also produced the defendants' wages book, showing that the whole of the remaining labourers in the works were receiving 6d. per hour.

Messrs. S. Page and D. Waller, builders, of the town, and Mr. E. J. Fairchild, secretary to the Federation, gave evidence as to the trade custom of setting on and payment, and also to prove that the before-mentioned arrangement as to the radius had never been acknowledged by the Croydon builders, who have an entirely independent organisation, comprising all the most important firms in the district, and whose maximum rate of wage has always been 3d. per hour less than the London union rate for all trades. The names of John Tidy and Messrs. Wenham Waters were put forward by the plaintiffs' solicitor as firms where Powell had previously worked in the town at the higher rate. The first was proved to be a piecework bricklayer or sub-contractor and the others the well-known firm of electrical engineers.

His Honour held that Powell, from the fact that he worked at the lower rate after receiving his wages the first week, had in effect agreed to it, and that both he and Purkiss, not inquiring as to the rate paid on the job, were set on by the foreman in accordance with the usual custom and entitled to the same rate of payment as the other labourers, which he held the evidence had proved to be 6d. per hour for that district. He, therefore, gave judgment for the defendants in both cases.

The defendants' solicitor stated his clients did not ask for costs.

WORKMEN'S COMPENSATION ACT:

CAN DEPENDENTS BRING A SECOND ARBITRATION?
At Marylebone County Court on Friday last week, before Deputy-Judge Cowper, an important application under the Workmen's Compensation Act was brought by Mrs. Kate O'Keefe, Crawford-street, Marylebone, on behalf of herself and children, the respondent being Mr. Henry Lovatt, builder and contractor, North End House, Fitzroy-avenue, Fulham, and Wolverhampton.

Mr. W. Thompson, counsel, appeared for the applicant, and Mr. F. Lowe, counsel, for the respondent.

The applicant's late husband, explained Mr. Thompson, had been in the employ of the respondent as a builder's labourer, and while working on a building in Bayswater-road, W., on February 1, 1899, fell from a scaffolding. Shortly afterwards the case came before Judge Stonor at Marylebone County Court, and the man was awarded compensation at the rate of 15s. a week. Subsequently the

unfortunate man died in consequence of the injuries which he sustained by the accident, and the present application was for leave to re-open the arbitration, with a view to an award of a lump sum being made to the man's dependents. On hearing of the man's death, the respondent ceased the payment of the compensation of 15s. a week.

Mr. Lowe contended that the Act did not provide for the dependents of a deceased person who had been awarded compensation under the Act—as in the present case—being entitled to a second arbitration.

Questions as to the interpretation of various portions of the Act were discussed at considerable length by counsel on either side.

Ultimately his Honour said that he had looked in vain for any clause in the Act which could be considered as entitling the dependents to bring a second arbitration under such circumstances as those in the present case. He therefore considered that the present application must fail.

It is understood that an appeal is likely to be made against the decision.

EMPLOYERS' LIABILITY ACT:

WHEN DO CRANE SKIPS BECOME DANGEROUS?

AT Brompton County Court on Monday, before Deputy-Judge Clement Lloyd and a jury, Thomas Dodge, a builder's labourer, 5, Merivald-road, Putney, S.W., sought to recover damages, under the Employers' Liability Act, from Mr. Charles Wall, builder and contractor, Ashburnham Works, Lot's-road, Chelsea, the claim being in respect of personal injuries sustained by plaintiff, owing, it was said, to negligence for which the defendant was responsible.

Mr. J. W. Moyses, counsel, appeared for the plaintiff, and Mr. C. F. Henle, solicitor, defended.

Mr. William Robert Pether, a civil engineer, was first called. He stated that on visiting the defendant's works shortly after the accident he was shown six crane skips, one of which was supposed to have been so defective as to cause the plaintiff's injuries. Each of these skips appeared to be in fairly good condition, with the exception of one which had new rivets at one of its corners, and also signs of having been hammered straight. In his opinion, it was not safe to set a man tipping skips who was not experienced at the work. The skip in question weighed about 4 cwt. when empty and about 24 cwt. when filled with earth.

The plaintiff stated that on December 17 last, having been in the employ of the defendant for about three or four weeks, he was working in a cutting at the new public baths, Walham Green. In the afternoon of that day his foreman, "Ring," came to him and said, "Dodge, go up and tip them skips; little Ginger" (another workman on the job) "has just met with an accident." He had never handled such skips before, and the foreman gave him no instructions as to how he should do the work. In accordance with the foreman's orders, he proceeded to tip the skips. The first that came up he tipped all right. The second skip which came up was loaded heavily on one side, and the side of the skip was bent in so much that the catch did not project outwards beyond the handle. In order to reach and release the catch he put his hand inside, between the handle and the side of the skip, the space here being large enough for him to have put in his head. He lifted the catch, the skip tipped over, but the corner of the skip, projecting outwards far beyond the side, caught his right hand against the bottom of the handle. The middle of his hand was seriously injured, and he had lost practically the whole of the use of his right forefinger. Since the accident he had only been able to do a few days' work per week.

Cross-examined: The only time that he had tipped skips prior to the accident was about sixteen years ago, when he assisted occasionally. These skips, however, were different from the one that caused the accident.

Other workmen corroborated as to the condition of the skip.

Mr. C. D. Collins, builder, Clapham, stated that at the request of the plaintiff's solicitors he had inspected certain skips used on the defendant's works. Some of the skips were in fair condition; one was in a very bad state, and another showed signs of being recently repaired. The side had been hammered out, and one of the corners had five or six new rivets.

Mr. Samuel Walsh Owen, M.R.C.S., &c., spoke as to the plaintiff's injuries. He considered that the man's injuries were permanent.

Mr. W. F. Sherard, M.R.C.S., &c., agreed generally with the evidence of the last witness.

For the defence Thomas Wright—known as "Ring"—said that he was foreman on the job in question. When the first man ("Ginger") met with his accident witness went to the plaintiff and said, "Dodge, what sort of a banksman are you?" By a banksman he meant a man to tip skips. The plaintiff replied that he could do the work, and witness then said, "Go up and empty the skips." Some of the skips on the job were in a very bad condition through being bent in at the sides. He did not, however, consider that the skips were dangerous, and there was no necessity for a man to put his hand between the side of the skip and the handle in order to release the catch.

Mr. Fredk. J. Smith, F.R.C.S., &c., totally disagreed with the medical evidence given on behalf of the plaintiff. He did not consider the man's injuries to be permanent; but, on the contrary, he found the hand almost restored to its normal condition.

William Weston, the defendant's general foreman, said that it was the constant lifting of the skips which bent in their sides. When skips were so bent they would be "usable," but the catch would, so to speak, be shortened. He did not consider the skip in question to have been in a dangerous condition.

The jury found in the plaintiff's favour, on the ground that the skip was defective, and that the foreman was negligent in not giving the plaintiff full instructions as to how he should do the work. They assessed the damages at 864.

His Honour gave judgment accordingly, and allowed full costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

23,820.—A SIPHONICAL DISCHARGE FOR WATER-CLOSETS: *H. L. Denton*.—A communication is made between the crown of the siphon and the upper end of the pipe that conveys in not giving the plaintiff full instructions as to how he should do the work. They assessed the damages at 864.

His Honour gave judgment accordingly, and allowed full costs.

23,845.—THE SAVING OF STONE, GRANITE, &c.: *F. Froehlich*.—An order that granules of cast-iron or steel may be employed for abrading purposes with circular saws, either the saws or the granules are magnetised. The adherence of the abrading material is effected with a coil, which is disposed at the side of the saw, the current being conveyed through brushes.

23,868.—SPIGOT AND SOCKET PIPE JOINTS: *J. Erick, J. W. White, W. Ferguson, E. Herron, W. Bales, W. Dodd, and W. A. Fairbairn*.—A shoulder is fashioned on one pipe that it may help to keep the other pipe steady during the time that the space between the two is being filled in with material. The joint is described as being adapted for use with pipes of clay, stoneware, brass, or cast-iron.

23,906.—AN APPLIANCE FOR USE WITH CRANES, LOAD-TRANSPORTERS, &c.: *J. Temperley and J. R. Temperley*.—The inventor's object is to prevent hauling or hoisting ropes from falling below the tops of the pulleys upon the rope-carriers before they become closed after the passing of the traveller. They provide hangers or loops upon the traveller, which will hold up the ropes, and deliver them on to the pulleys, the pulleys being mounted upon pivoted carriers after the kind specified in No. 14,162, of 1897.

23,956.—AN ATTACHMENT FOR DOOR-KNOBS: *G. H. Burrows*.—Notches cut in a hole in the door-knob are engaged by teeth that project from the neck, which is fashioned also with a collar, against which the knob is fastened by a bending-outwards of the teeth. The knob is made in two portions, whereof one fits within the other, and the two portions are fastened together by spinning the edge of one down over the shoulder of the other.

23,947.—AN APPLIANCE FOR USE WITH EXTINGUISHERS: *J. C. Mather and C. J. W. Yakenan*.—For purposes of opening it the acid-bottle is caused to slide inside a cage, and when the extinguisher is inverted a cutter cuts a thin membrane with which the bottle is closed. By a variant method a cam, which is turned with an outside handle, is so arranged as to be pressed against the membrane, and a frame at the top of the extinguisher retains the acid-bottle; or mixing-blades are attached to the axis which turns the cam.

23,948.—KILNS FOR DRYING EARTHENWARE GOODS: *C. Damsari*.—At the side and along the length of the drying-chamber is a conduit for hot air, the air entering from a passage having apertures that are provided with dampers. Upon the other side of the drying-chamber waste or discharge passages are placed. The partitions may be either permanent or removable, and for waste with air indirectly heated the conduit and flue may be joined with iron tubes. If the flue is made in two portions, one of them will receive the watery vapour and the other the gases of combustion, whilst chimney-shafts connected to the upper part of the flue will prevent the outlet apertures from becoming cool.

23,963.—MEANS OF CLEANING BASINS, BATHS, &c.: *Peck Bros. & Co.*—For removing dirt, &c., which has collected around the base of the top of a bath, washing-basin, &c., the inventor fashions a ribbed tube-shaped extension upon the base of the tub, and upon the extension he puts a shell of porcelain or similar material. The shell has inside grooves, and is so arranged that it will slide vertically upon ribs, whereby one can easily dislodge dirt from the base of the tub.

23,966.—THE MOULDING OF CLAY, ARTIFICIAL STONE, &c.: *C. Caerney and C. Schlimp*.—The feed-box is made whole with, or is firmly secured to, a die-block that moves beneath a fixed head, and propels the moulded brick slab or block on to the table; a cam and lever lift the moulding-box when

it is filled for engagement with the die, so that it motion upwards of the lower die (under the action of a hydraulic plunger) will compress the completely enclosed clay or artificial stone. In the first instance the material within the mould is subjected to the preliminary pressure of water which has been admitted into the cylinder under a pressure of relatively low amount, then water at an increased pressure is allowed to enter. When the block has been extruded from the mould on to the table through the entry of water at a low pressure in the cylinder the water is allowed to escape from the cylinder and a shaft with lever and rod mechanism are the cams that work the supply and exhaust valves of the cylinder. The dislodgment of the mould-box during the reciprocation of the feed-box is obviated by means of the cheeks or flanges upon the sides of the upper die.

23,987.—AN INSTRUMENT FOR USE IN BUILDING WALLS: *J. Goffe*.—The contrivance is devised for use in the building of walls at a given angle to one another, and to furnish means of obtaining the true horizontal and plumb lines; two blades, which can be set at the angle desired, are joined at their bases with an angle-plate, when some courses of bricks are being pushed in between two of the courses, the true plumb being determined by two levels mounted upon the blades; as the building continues the contrivance is sustained with movable hooks that are inserted into the joints between the bricks, and the line is to be held by holders mounted upon double-tailed slides, which are adjusted on scales marked upon the blades and are fastened with set-screws.

24,062.—WORKING IN WOOD: *R. Boughton & J. E. Smith*.—For cutting a groove in a block of wood and preserving (in the shape of a stick) the removed material at the same time the cutter is shaped as a semi-cylindrical sheet. The depth of the cut is controlled with an adjustable piece, and the cutter, which may be enclosed within a case, may have a row of teeth, can be driven by hand power. A lug serves to turn the tool gradually in making the cut, and for the groove the right and left halves should be cut separately, with a reversal of the tool for the second cut.

24,110.—A CRAMP FOR CONCRETE, STONE, &c. SIMILAR BLOCKS: *W. Shields*.—The contrivance intended for cramping blocks together in the construction of breakwaters and kindred works. It consists of two arms, on the nearer side of each of which is fashioned a flattened or rounded bearing-surface, whilst on their remoter sides are heels that will be against the surfaces of holes made in the blocks. In the heads of the clamping-arms are holes through which is passed a bolt that is tightened with a nut, or otherwise, so as to draw the blocks and the arms towards one another.

24,126.—ELECTRICAL CURRENT METERS: *Wright and Mutual Electric Trust*.—For purpose of a maximum demand indicator is made a vessel that holds liquid, and is fashioned in such a shape that the liquid is caused to flow from one portion of the vessel into the other without returning when the vessel is tilted (against the action of a spring) by a mechanism that comprises a sustaining-pulleys rope and a coil carrying the current. The quantity of fluid transferred is measured with a scale upon one part of the vessel. The normal position of the vessel is adjusted with a removable stop and provision is made—in one form with a constricted tube—for checking the too quick flow of the liquid into one portion of the vessel into the other.

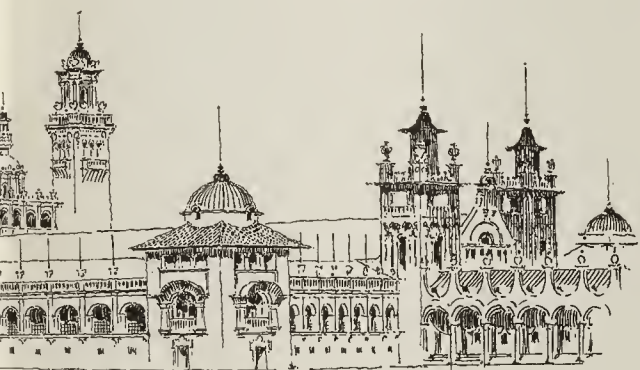
24,181.—A PAINT-SCRAPER: *F. H. Crocker*.—Through the length of the handle is passed a bar of which one end is squared so as to take a slot in the scraper, and the other end is screw-threaded for a nut, by which means the handle is forced to hold the scraper securely. When the handle is turned a little the pressure becomes relaxed and the scraper is liberated.

24,185.—A REGULATING VALVE FOR PLUMB WATER SERVICE: *H. M. Williams*.—A cam attached to the axis of the balanced lever, when it is lifted impinges against a stem so as to open a spring-controlled valve, whereupon the flush ensues. As the flush-water traverses the valve, it communicates with the crown of the outlet siphon, the air becomes exhausted and basin discharge is started. The leaking of water into a receiver at the remoter end of the balanced lever effects an automatic closing of the valve, lever being in the end weighed down by the weight so that the spring is thereby released to pressure and shut the valve. A screw which regulates the current of water into the receiver controls the position of the flush.

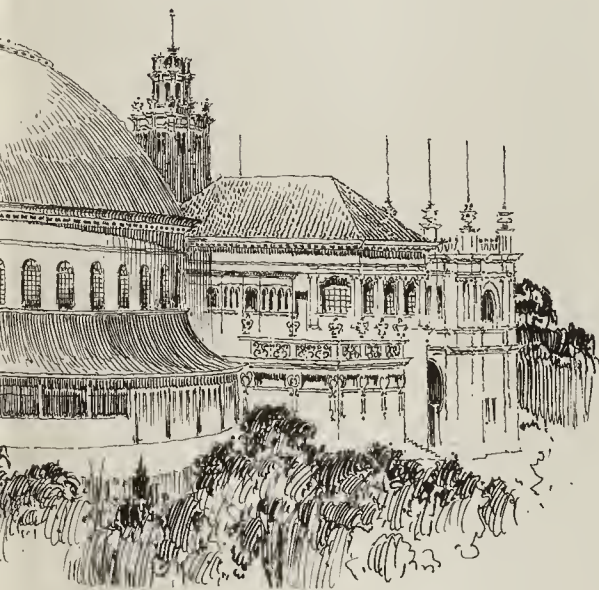
24,187.—A CONTRIVANCE FOR BATH WATER SERVICE: *J. Simpson*.—The apparatus is designed for ensuring automatically the opening of discharge valves at the expiration of a fixed interval of time. A cord forms a connexion between the valve and a spring-drum, which under certain conditions is held by a pawl which a link joins an arm upon the axis of the drum; two oil valves communicate by means of a passage which is provided with a cock, and are attached to a cylinder. The filled cylinder is horizontal when the mechanism is set for action, but as oil flows slowly into the cylinder assumes a vertical position, whereupon stop upon the sleeve lifts the radial arm upon the axle of the drum, which then begins to







INDUSTRIAL HALL
VIEW FROM
THE NORTHWEST



VIEW FROM
THE NORTH



the cord, and so to lift up the discharge valve. In a modified form of the general principle involved a pawl in engagement with a rack attached to the discharge valve is substituted for the spring-drum.

24,227.—**FRIBS FOR DOORS, SPRINGS, PAVEMENTS, &c. F. W. HUBBERTS**—A beplate of some hard material, such as steel, is fashioned with slits and with tongues turned up at a right angle. Strips of some non-slipping material are fastened between the tongues and pressed through holes in the base-plate, or through holes in the tongues, so as to engage with projections upon the latter. By another method the leaden or other non-slipping material is laid across the entire face of the be-plate evenly with the upper edges of the tongues.

24,311.—**A GRIP FOR ROPES AND CHAINS: M. SCHIMPF**—The grip consists of two parts which are joined together; the wedge-shaped end of one part is set in adjustment with a lever which is passed through the notch, and of which the forked end closes the two parts. Upon the pin which belongs to the same part works a slotted bar, provided with a ring for its attachment to the load; the grip upon the rope or chain can be increased by turning the bar in the sense of a wedge.

24,349.—**CONTINUOUS STAIRWAYS: F. M. DODGE**—Over-lapping links, pivoted together and having cross-bars at intervals, constitute the chain, the inner-links being altered in their shape in order to allow allowance for flexure. Sprocket-wheels carry the chain-band. End rollers upon the cross-bars engage alternately with guide-grooves, so as to take tread and risers, and with another groove as to chain-band is returned.

24,375.—**A COMPOUND FOR CLEANING CHIMNEYS: L. HILSON**—For consuming or dispersing collected soot an admixture is made of nitrate of potash, lithum, and some non-hygroscopic material such as phosphate of soda, an iron or alkaline sulphate, irbionate of soda, or other finely-divided silica or urth.

MEETINGS.

SATURDAY, APRIL 6.
Edinburgh Architectural Association.—Visit to Uchie and Clackmannan Towers.

MONDAY, APRIL 8.
Bristol Society of Architects.—Annual General Meeting, Election of Officers and Council. 8 p.m.
Dundee Institute of Architecture.—Visit to Brechin Cathedral and Edzell Castle.

WEDNESDAY, APRIL 10.
Edinburgh Architectural Society.—Mr. Percy E. Abbs on "Impressions of a Tour in Italy."

THURSDAY, APRIL 11.
Sheffield Society of Architects and Surveyors.—Annual Meeting. Election of Officers, &c. 7 p.m.

FRIDAY, APRIL 12.
Institution of Junior Engineers (Westminster Palace West).—Paper on "Iron-lined Tunneling Construction," Mr. A. Woodroffe Stanton. 8 p.m.
London Association of Architects.—Mr. J. K. Ward on "Warm-air Heating Apparatus and the Aiding Preparations Necessary thereat." 8 p.m.

SATURDAY, APRIL 13.
Institution of Junior Engineers.—Visit to Great Northern and City Railway Works to inspect plant. 2 p.m.
British Institute of Certified Carpenters.—Mr. G. G. Smith on "How is the Future Workman to be Trained." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.
March 20.—By H. J. WAY & SON (at Newport), Newport, Isle of Wight.—184, Lower St. James' St., f. 4,110

March 22.—By ROBERT REID, 1,000
w Bond st.—Haunch of Vemion-yd., work- shops and premises, u.t. 23 yrs, g.r. 100, f. 1,500
h, Haunch of Vemion-yd., u.t. 25 yrs, g.r. 660
17, 60, f. 750
gravel, 15, Weymouth, u.t. 25 yrs, g.r. 300, f. 280
nsington.—Palace Garden-st., &c., i.g.r.'s 2,310
1100, u.t. 25 yrs, g.r. 54
11haston.—13 to 19 (odd), Storey-nd., u.t. 79 yrs, g.r. 211, f. 911
12 and 20, St. Mary's-rd., f. 1,600
5, Falkstoner-nd., u.t. 84 yrs, g.r. 44, 100, f. 250
ion.—7, Belmont Park-rd., u.t. 95 yrs, g.r. 51
By ROGERS BROS., 1,000
Hillington.—25, Agnes-pl., u.t. 78 yrs, g.r. 92
neth.—37, Tenison-st., u.t. 23 yrs, g.r. 100
ham.—10 to 20 (odd), Bleimhen-grove, u.t. 52 yrs, g.r. 274
13 to 27 (odd), Nunhead-grove, u.t. 56 yrs, g.r. 1,645
13, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 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1193, 1195, 1197, 1199, 1201, 1203, 1205, 1207, 1209, 1211, 1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235, 1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259, 1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283, 1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307, 1309, 1311, 1313, 1315, 1317, 1319, 1321, 1323, 1325, 1327, 1329, 1331, 1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355, 1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379, 1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403, 1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427, 1429, 1431, 1433, 1435, 1437, 1439, 1441, 1443, 1445, 1447, 1449, 1451, 1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475, 1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499, 1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523, 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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Isolation Hospital	Trowbridge Hospital Committee	200, 100	June 24
*Fire Station	Manchester Corporation	300, 200, and 100	do.
*Shops and Houses, Parkgate	Darlington Corporation	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Drain Pipes, &c.	Partick (N.B.) Town Council	Kincaid & Co., Engineers, 29, Great George-street, S.W.	April 9
Road Works, Widdow, Brighton	Walsall R.D.C.	Jeppinson & White, 1, Prince's-street, S.W.	do.
Public Baths, Glodwick	Oilham Corporation	S. A. Pickering, Civil Engineer, Town Hall, Oldham	do.
Hotel, Bargoed, Wales	Royston U.D.C.	G. Kenhole, Architect, Duffryn, Mace-y-gwimmer	do.
Additions, &c., to Town Hall	Canterbury Corporation	H. F. J. Bannan, Council Offices, Royston	do.
Granite Road Metal, Channelling, &c.	Rotherham Corporation	A. C. Turley, Civil Engineer, 49, High-street, Canterbury	April 10
Freshley Retorts, Bricks, &c.	Banbury R.D.C.	F. A. Winstanley, Engineer, Town Hall, Rotherham	do.
Drainage Works, Alkerton Hill	Tenterden Town Council	H. Gander, Surveyor, Bath-road, Banbury	do.
Cherbourg Quartzite Road Metal	Leicestershire Asylums Board	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden	do.
Cement, Lime, Kerbing, &c.	Kirkcaldy Town Council	R. S. Lockie, Engineer, Town Hall, Hemel Hempstead	do.
Police Buildings	Barry U.D.C.	Williamson & Inglis, Architects, Kirkcaldy	do.
Bathing Houses, &c., Whitmore Bay, Glam.	Briery Hill Workmen's Fldg. Club	J. C. Pardoe, Civil Engineer, Council Offices, Barry	do.
Twenty-five Houses, Ebbw Vale, Mon.	Caistor (Lincs) Guardians	O. Newcomb, Architect, Laburnum House, Ebbw Vale	do.
Farm Buildings, &c., Winwick, near Warrington	Hornsey U.D.C.	J. P. Muspratt, Council Offices, Preston	do.
Drainage Works, &c., at Workhouse	Willesden District Council	J. C. Newb, Eleanor-street, Ormsby	April 11
Additions to Schools, Barden-road, Tonbridge, Kent	Willesden District Council	John Fagg, Quarry Bank, Tonbridge	do.
Electrical Plant	Willesden District Council	F. D. Askey, Council Offices, Southwood-lane, Highgate, N.	do.
Road Making, &c., Works	Willesden District Council	Jackson & Fox, Architects, 7, Rawson-street, Halifax	do.
Additions to Bare Schools, Morecambe	Willesden District Council	Engineer, Public Offices, Dyne-road, Kiburn, N.W.	do.
Lavatories and Shelters, Meols-parade	Willesden District Council	J. Hartley, Architects, Euston Chambers, Morecambe	April 12
Granite, Kerbs, Setts, &c.	Willesden District Council	T. Foster, Engineer, Council Offices, Hoylake	do.
Engines, Dynamos, Travelling Crane, &c.	Kirkcaldy (N.B.) Corporation	F. W. Mager, Engineer, Aldridge, Walsall	April 13
Additions, &c., to Sanatorium	Wigan Corporation	W. L. Macindoe, Town Hall, Kirkcaldy	April 15
Kerbs, Setts, Macadam, &c.	Wigan Corporation	W. Bolton, Borough Engineer, Rodney-street, Wigan	do.
Sewerage Works, Ellsmere Port, near Chester	Wigan Corporation	L. G. Dasher, Surveyor, Council Offices, Hoylake	do.
Hospital Pavilions, &c.	Wirral R.D.C.	W. C. Priest, Civil Engineers, 13, Harrington-street, Liverpool	do.
Broken Granite (3,500 tons)	Eastbourne Corporation	W. C. Field, Architect, Town Hall, Eastbourne	do.
Cast-iron Pipes (180 tons)	Plomesgate R.D.C.	T. Waller Read, Council Offices, Wickham Market	do.
Six Purifiers, &c.	Birminghams Corporation	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Pipes, &c.	Hindley Corporation	S. Holt, Gasworks, Hindley	do.
Borehole, Clephill	Leeds Corporation	W. J. Davies, Town Hall, Leeds	do.
Stoneware Pipe Sewers, High-street, &c.	Amphill (Beds) U.D.C.	G. & F. W. Hodson, Engineers, Loughborough	do.
Schools	Quarry Bank U.D.C.	W. Fieldan, Surveyor, Old Bank Offices, Stourbridge	April 14
*Laundry	Harrow United District School Bd	Houston & Houston, Architects, 5, York-buildings, Adelphi, W.C.	do.
*Paving	Wills County Lunatic Asylum	County Offices, Trowbridge	do.
Steel Superstructure, &c.	Deptford Borough Council	Municipal Offices, 20, Tanners-bill, Deptford	do.
Outfall Sewers and Purification Works, Cranleigh	Chatham Town Council	A. T. Walmisley, Civil Engineer, 9, Victoria-street, S.W.	April 11
Service Reservoir, Upleadon	Hambleton R.D.C.	E. L. Lunn, Surveyor, 38, High-street, Ouford	do.
*Repair of floors	Gloucester Corporation	R. Read, Civil Engineer, Guildhall, Gloucester	April 11
Four Houses, Shuis Institution, Carrickfergus	Metropolitan Asylums Board	Offices, Embankment, E.C.	do.
Pipe Sewers, &c., Acomb, Yorks	Great Ouseburn R.D.C.	Young & Mackenzie, Architects, Scottish Provident-bldgs., Belfast	April 20
School Buildings, &c.	Cressing (Essex) School Board	Fairbank & Son, Civil Engineers, 13, Lendal, York	do.
Bridges over river Clyde, Glasgow	Caledonian Railway Company	Clark & Ross, Architects, 85, Duke-street, Chalmers	April 20
Pipe Sewers, &c.	Tandfield (Durham) U.D.C.	J. Blackburn, 302, Buchanan-street, Glasgow	April 20
*Post Office	Gloucester Corporation	R. Heslop, Surveyor, Barnoldfield, E.S.O.	do.
Three Blocks Workmen's Dwellings	Sunderland Corporation	Storey's Gate, S.W.	April 20
Additions to County Borough Asylum, Ryhope	do.	do.	do.
Villa Residence at Asylum	do.	do.	do.
*Foundations	Office of Works	Storey's Gate, S.W.	do.
*Painting, &c.	Wanstead School Board	J. T. Bressy, 74, Bishopsgate-street Within, E.C.	May 1
*Sewers, &c.	Walsall & District Hospital Com.	Bailey & McConnell, Architects, Bridge-street, Walsall	No date
Nurses Home, &c., Wednesday-road	Church, Greshill, Wath-upon-Dearne	E. I. Hubbard, Architect, Moorgate-street, Rotherham	do.
Granite Memorial Obelisk, The Downs, Clifton, Bristol	Excavation Works, Clayton-le-Moors	F. W. Marks, Architect, 8, Staples-inn, W.C.	do.
Causewaying, Kerbing, &c., Victoria Bridge	Causewaying, Kerbing, &c., Victoria Bridge	Haywood & Harrison, Architects, Post Office-chambers, Acerrington	do.
Business Premises, Dromore, Co. Down	House, Tarrington, near Hereford	O. H. Stevenson, Town Hall, Haddington	do.
Large Shed Buildings, near Consett, Durham	Club and Institute, Rowland's Gill, Durham	J. Russell, Civil Engineer, Architect, 22, Waring-street, Belfast	do.
Drying Shed, &c., Military-road, Colchester	Sixty-four Tenements	Engineer, Consett Iron Works, Co. Durham	do.
Hospital and Block of Buildings	Hospital and School, Handsworth, Yorks	J. W. Start, Architect, Colchester	do.
Five Houses, Horsforth, near Leeds	Residence, How Mill, near Carlisle	J. W. Bradley, Civil Engineer, Town Hall, Wolverhampton	do.
		H. P. Monckton, Architect, 35, Walbrook, E.C.	do.
		J. P. Earle, Architect, Norfolk-row, Sheffield	do.
		Thos. Throup, Woodsie, Horsforth	do.
		T. Taylor-Scott, Architect, 43, Lowther-street, Carlisle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be held
*Principal Clerk and Assistant Solicitor	Holborn Borough Council	2000 per annum	April 11
*Assistant Surveyor and Building Inspector	Litherland U.D.C.	1100 per annum	April 11
*Chief Highway Surveyor	Nottingham Corporation	2500 per annum	April 11

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. lv. Contracts, pp. lv. vii. x. & xviii. Public Appointments, pp. xvii. & xviii.

PRICES CURRENT OF MATERIALS.

Our aim in this list is to give, as far as possible, the prices of materials, not necessarily the lowest, and quantity obviously affect prices—a fact which is remembered by those who make use of this list.

Table listing prices for BRICKS, &c. and STONE. Includes items like 'Bricks, 1 1/4 6 per 1,000 alongside, in river', 'Pit Sand', 'Blue Lias Lime', and 'Limo'.

Table listing prices for SLATES and TILES. Includes items like 'Slate, Bangor', 'Portland Cement', and 'Roofing Tiles'.

Table listing prices for WOOD. Includes items like 'Fir timber: Best middling Danzig or Memel', 'White Sea: First yellow deals', and 'Second yellow deals'.

Table listing prices for METALS. Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

PRICES CURRENT (Continued).

Table listing prices for WOOD (continued). Includes items like 'Fir timber: Best middling Danzig or Memel', 'White Sea: First yellow deals', and 'Second yellow deals'.

Table listing prices for JOINERS' WOOD. Includes items like 'White Sea: First yellow deals', 'Battens, 2 1/2 in. and 3 in. by 7 in.', and 'Third yellow deals'.

Table listing prices for JOISTS, GIRDERS, &c. Includes items like 'Rolled Steel Joists, ordinary sections', 'Compound Girders', and 'Angles, Tees and Channels'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

Table listing prices for METALS (continued). Includes items like 'Iron: Common Bars', 'Staffordshire Crown Bars', and 'Sheet Iron, galvanized'.

PRICES CURRENT (Continued).

Table listing prices for METALS. Includes items like 'BRASS—Strong Sheet', 'Tin—English Ingots', and 'Solder—Plumbers'.

Table listing prices for ENGLISH SHEET GLASS IN CRATES. Includes items like '15 oz. thirds', '24 oz. thirds', and '30 oz. thirds'.

Table listing prices for OILS, &c. Includes items like 'Raw Lined Oil in pipes', 'Boiled Oil in pipes', and 'Turpentine in barrels'.

Table listing prices for VARNISHES, &c. Includes items like 'Fine Elastic Copal Varnish for outside work', 'Best Elastic Carriage Varnish for outside work', and 'Best Hard Oak Varnish for inside work'.

Table listing prices for TO CORRESPONDENTS. Includes text about the responsibility of signed articles and the publisher's policy on rejections.

Table listing prices for TENDERS. Includes text about communications for insertion under this heading and the publisher's policy on rejections.

Table listing prices for TENDERS (continued). Includes text about communications for insertion under this heading and the publisher's policy on rejections.

Table listing prices for TENDERS (continued). Includes text about communications for insertion under this heading and the publisher's policy on rejections.

Table listing prices for TENDERS (continued). Includes text about communications for insertion under this heading and the publisher's policy on rejections.

See also next page.

HISTON.—For Baptist Schools, Histon, Cambridge. Messrs. Geo. Baines and Reginald Palmer Baines, architects, 5, Clement's-inn, Strand, W.C. 1.—

Table with columns for architects: T.G. Cowell, Oak Building Company, Ernest West, Coulson & Lofts, William Wade, Scales & Robins, H. Feast. Rows for estimates A through E, and a total estimate of £1,900.

LONDON.—For the erection of boundary wall, &c., at electricity works, Townmead-road, for the Fulham Borough Council. Mr. Charles Botterill, C.E., Town Hall, Waltham Green, S.W. 1.—

WEST HAM.—For the erection of dynamo-house, Dagenham, for the Town Council.—

NOTTINGHAM.—For the erection of motor-car works, Canal-street, for Mr. E. R. Bridson. Mr. W. Dymock Pratt, architect, Cauldon Chambers, Long-row, Nottingham. Quantities by architect:—

WREXHAM.—For additions to Vron Schools, Brymbo, for the School Board. Messrs. Davies & Moss, architects, 2, Temple-row, Wrexham. Quantities by architects:—

RUSHDEN.—For the erection of two houses and stables for Mr. Alex. Ladds, "Hayway, Rushden." Quantities by the architect, Mr. H. Knight:—

CORRECTION.—In our issue of the 9th ult. the name of Messrs. Chessum & Sons appears in the list of tenders for police station at Sidcup, instead of Messrs. J. T. Messom & Sons.

TERMS OF SUBSCRIPTION. "THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 2s. per annum (13 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 2s. 6d. per annum. Remittances payable to DOUGLAS FOURDRIER should be addressed to the publisher of "THE BUILDER," Catherine-street, W.C.

ST. ALBANS.—For alterations and additions, Myrtle Cottage, London-road, for Mr. W. H. Moores. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

W. H. Lascelles & Co., 121, BUNHILL ROW, LONDON, E.C. Telephone No. 1365, London Wall.

SALTASH.—For alterations and additions to No. 2, Port View Villas, for Mr. J. Bennett. Mr. Edgar M. Leest, architect, Saltash and Devonport:—

HIGH-CLASS JOINERY, LASCELLES' CONCRETE Architects' Designs are carried out with the greatest care.

SHENLY BARNET (Herts).—For a pair of cottages for Mr. Thos. Perry. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

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The Builder.

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APRIL 13, 1901.

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The Proposed Queen Victoria Monument.



It appears that the announcement of the selection of five architects to engage in a limited competition for the proposed monument to Queen Victoria, which had found its way into some of the daily papers, was substantially correct. It is now officially announced at Mr. T. G. Jackson, R.A.; Mr. Aston Webb, A.R.A.; Mr. Ernest George, Sir Thomas Drew, and Dr. Rowand Anderson, have been invited to prepare designs for the treatment of the western end of the Mall, where the monument itself (in whatever form) is to be placed; and also to submit a general scheme to include an architectural entrance to the Spring Gardens end of the Mall, as well as "an architectural re-arrangement of the Mall with groups of sculpture at intervals, and a whole forming a processional road." The Committee having the matter under consideration consists of Lord Esher, Lord Lansdowne, Sir E. Poynter (President of the Royal Academy), Mr. W. Emerson (President of the Institute of Architects), Mr. Sidney Colvin, and Mr. A. B. Freeman Mitford. It has also been decided to invite Mr. Thomas Brock, R.A., to prepare a design for a group of sculpture, including a statue of the late Queen, to be placed opposite the entrance gates of Buckingham Palace. The Committee seems a good one, and the appointment of the President of the Royal Academy and the President of the Institute of Architects implies that it is intended that both sculpture and architecture should be properly considered in the scheme. It is also interesting to note that Mr. Mitford's claims to a place on the Committee are not apparent; but at the same time this is an improvement on the events of twenty years ago, when committees of taste on public works were usually made up of political grounds only, and artists were carefully excluded.

Beyond this, however, we fear that the inception of the scheme cannot be regarded as satisfactory, and will not give satisfaction to the public. No architects of any standing, of course, will grudge the five selected men their good fortune, in spite of the absurd idea of the *Times*, that the glaring piece of self-advertisement on the part of one person, which they allowed to appear in their columns, represents the general feeling of disappointed architects craving for a share in the job; a conclusion which is a sort of libel on all the most eminent and self-respecting architects of the day. But if the competition was to be limited, we may reasonably ask, why it was to be limited to five? Surely the Committee might have found a dozen architects in Great Britain worth including in the list, and have thus given a wider basis to so important a competition. But our own opinion is—without which, it is evident, public feeling coincides—is, that for a work of such national interest and such great importance there should at least have been a sketch competition open to all architects and sculptors of the United Kingdom. Such a competition would have been an event of the greatest interest in itself, and might have brought out some suggestion of genius which every one would have been glad to have. From such a sketch competition six, say, might have been selected to engage in a final competition. Some such system is undoubtedly what would have been adopted in France, where they understand better how to manage these matters.

And if we (and the public) complain of the limitation of the competition to five architects, we have still more right to complain of its limitation to one sculptor. Mr. Brock has a special reputation for portrait statues, but it can hardly be maintained that he is the leading genius in English sculpture; nor ought this to be a mere question of a portrait statue. On the contrary, it is a question whether a portrait statue is an advisable element at all in such a monument. For in all portrait sculpture there is the unavoidable discrepancy between the ideal

character of sculpture as an art, and the realistic character of modern costume. We may again appeal to the example set by the French, frequently at least, in such cases of personal memorials. Their favourite scheme is to produce a monument with symbolical sculptured figures representing abstract qualities or virtues, accompanying a bust or medallion portrait of the person commemorated, without any attempt at a realistic full-length presentation. Thus the whole monument is raised to the level of a poetic conception, and the incongruity of the prosaic detail of modern costume is avoided. In one case in England this has been admirably done on a small scale, in Mr. Gilbert's beautiful monument to Fawcett which is hidden away in a dark corner behind the west door of Westminster Abbey. And may we not take the Albert Memorial as a warning in this respect? In a general decorative sense the Albert Memorial, with some faults, is a remarkable work, in our opinion a good deal under-valued; but what is the absolute mistake (not to use a stronger word) in connexion with it? The portrait statue, unquestionably.

Let us turn now to the purely architectural part of the problem, and consider what can be done with this proposal to transform the Mall into "a processional road, with groups of sculpture at intervals." There are one or two points in connexion with such a scheme which do not seem to have occurred to any one, as far as published comments go at all events. In the first place, any transformation of the Mall into a really dignified and architecturally designed processional road must involve cutting down the existing trees in it, to begin with. If they were grand "immemorial" trees (to use Tennyson's expression) this might not be necessary; but they are poor and irregular growths, not likely either to come to anything more, and they would sadly interfere with any attempt to produce a monumental effect. Secondly, it certainly appears to us that if the ground immediately in front of Buckingham Palace is to become a monumental site sacred to

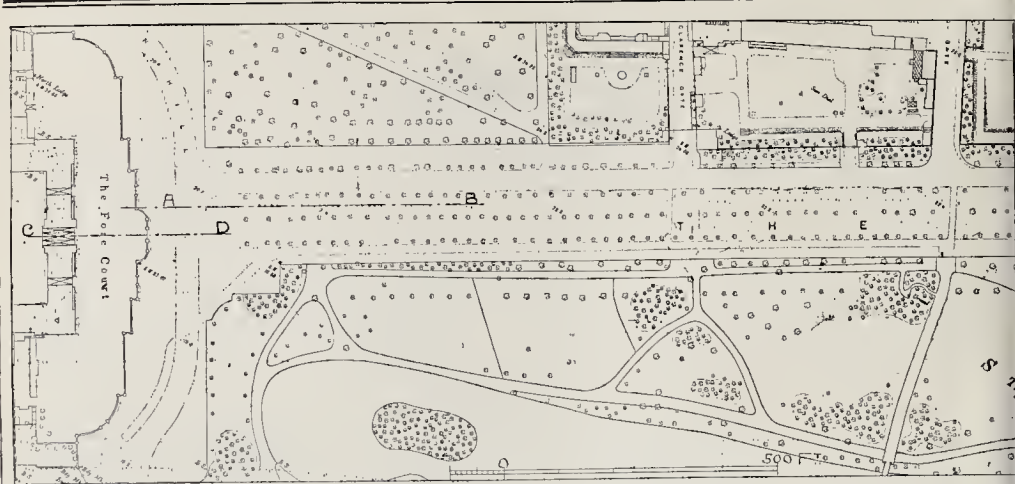


Fig. 1.—Buckingham Palace and the Mall as at Present.

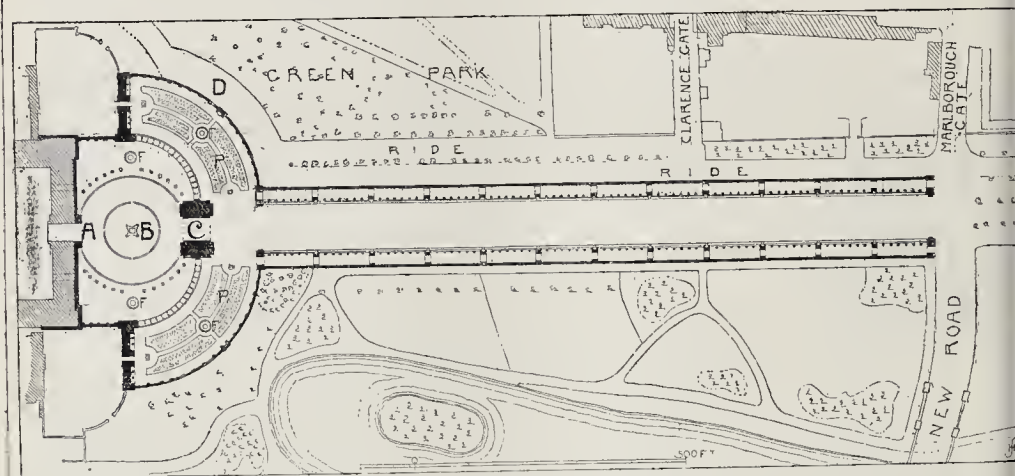


Fig. 2.—Plan for Colonnaded Approach and Triumphal Arch.

A. Buckingham Palace with new face to the façade.
B. Victoria statue.

C. Triumphal arch.
D. Road connecting Constitution Hill with Ride.

F. Fountains.
P. Ornamental parterres.

the memory of a great sovereign, the first thing to do is to put a stop to its use as the common cab thoroughfare to Victoria Station. It is we believe the fact (at all events we have seen it confidently stated in print), that the late Queen herself strongly objected to the existence of this exceedingly public road just outside the front railings of the Palace; and it may have been partly on that account that she used Buckingham Palace as little as possible. Certainly, a greater seclusion and dignity ought to belong to the approaches to the principal royal palace of the capital. Thirdly, as we have already observed, Buckingham Palace, though it contains internally a very fine *suite* of rooms, is externally a very poor affair in an architectural sense, quite unworthy of its position and function; and the erection in front of it of a new and, we may hope, impressive monument will render it, by contrast, even less imposing than at present. We again therefore, strongly urge that this occasion should be taken to reface the principal façade of the Palace, or rather the whole of the front block, including the returns at the ends, with a new and more dignified design carried out in a

fine stone; and that this should be considered as a portion of the memorial scheme, and form at the same time a worthy architectural background to the new monument.

Now, considering the two obstacles to a monumental processional road to which we have referred—the trees and the public cab-road, we would suggest that there is a method of making these two difficulties meet each other half-way, so to speak. But first let us reconnoitre the ground. Fig. 1, reduced from the Ordnance map, shows the site as now existing. From this it will be seen that though the avenue more especially called the Mall is central, or approximately so, with the axis of the Palace, the central axis of the total space, including the road and the avenue north of it, is some 50 ft. out of axis with the Palace. We will return to this point presently; let us for the present consider the Mall only, as axial with the palace. In order to divert the cab-traffic from the monumental site and from the vicinity of the Palace, we propose (fig. 2) to make a new road forming a continuation southwards of Marlborough Gate, crossing the lake in St. James's Park

by a new stone bridge a little eastward of the present footbridge (which would be moved), and joining Birdcage Walk,* along which the public traffic would then go. This new bridge might be so treated as to be an ornament to the park, and it would also serve an exceedingly useful purpose by affording (what is much wanted) a direct road to St. James's-street from the centre of Westminster, instead of the circuitous route round one end or another of St. James's Park. Having thus got rid of the cab-road to the Palace, we have also got a good excuse for treating the Mall in two sections, east and west of the crossing of this new road. The eastern portion would be left with trees, as it is at present, but with an architectural arch or other entrance from Whitehall. The portion west of Marlborough Gate would form a semi-private State avenue of approach to Buckingham Palace. The scheme indicated in fig. 2 shows a colonnaded loggia lining the road on the east side, with niches for sculpture at the pier and the back wall of the loggia could be decorated

* Only the commencement of this road is included in the plan, but its proposed course is easily understood.

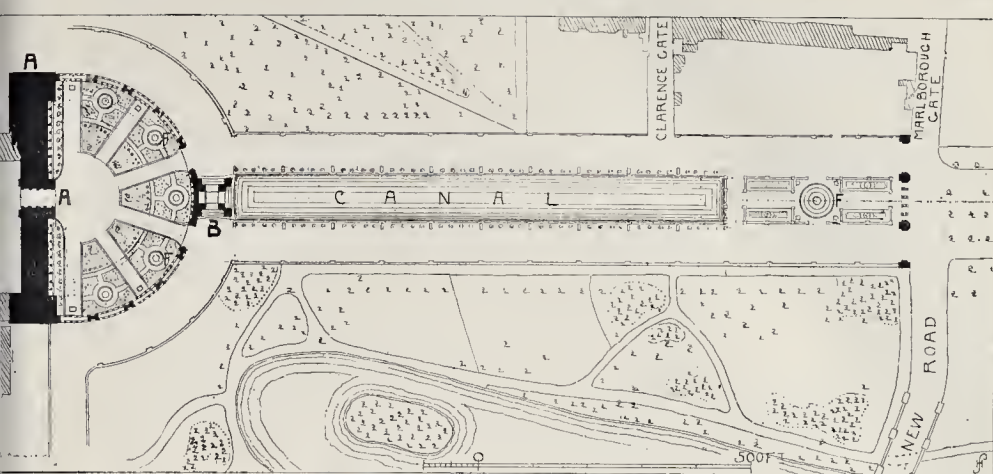


Fig. 3.—Plan for Monument with Long Canal Facing it.

A. Front block of Buckingham Palace rebuilt and extended northwards. | B. Victoria monument. | F. Fountains.

with a series of frescoes representing English history. This road is up to a large triumphal arch, forming the entrance to the forecourt of the palace, the Marble Arch actually did in former times. The forecourt is enclosed by semicircular colonnades, through which could be seen the Victoria Monument erected in the centre of the court. Outside these circular colonnades a space is laid out with ornamental flower-beds. At the northern entrance to the road, by Marlborough Gate, would be great ornamental colonnades across the carriage-way. The idea is the public under ordinary circumstances should be admitted into the loggias and up the colonnades of the forecourt, but on occasions of levees and Drawing-rooms at the Palace they would be excluded, and the gates would then be open for the passage of carriages by this State route to the palace. The space now occupied by the carriage-way is turned into a Ride, which connects with Constitution Hill.

For carrying out such a scheme the trees in the Mall westward of Marlborough Gate would have to be removed, with the exception of the northernmost row, left standing in the Ride. If people exclaim at this as a needless proceeding, the answer is that a similar change was made in that way. For a decorative treatment of a site on a great scale, Nature must necessarily give way to

we may imagine a treatment on a somewhat more extensive scale, still retaining the expedient of the new road from Marlborough Gate to Birdcage Walk, and the entrance gates by Marlborough Gate, but occupying the whole width of the Mall, the present carriage-road included. In this case the axis of the new site would be nearly northward of that shown on fig. 2, and the front block of the Palace would be rebuilt and extended about 100 ft. northward, so as to bring its central axis in with that of the approach (see fig. 3). The entrance into the inner quadrangle of the Palace would necessarily be brought out in line with the quadrangle, and moved over to its north-east angle; but that is a matter of minor consequence compared

with the general visible effect externally. By taking a few feet off the St. James's Park ground on one side, and a similar amount off some private gardens and the Green Park on the other side, we get width enough for two roads up to the forecourt of the Palace, for going and returning, and a straight canal between them, lined at symmetrical distances with pedestals, either for groups of sculpture, or sphinxes, or some analogous symbolical sculptures; while at the west end of the canal would rise the Victoria Monument, a structure comparable in scale and richness to the Albert Memorial, forming the culmination to the vista, and reflected in the water of the canal. If people say this canal is an extravagance, and not worth the result, it may be asked why they admire, and why artists are continually painting, the effect of the Taj Mahal seen at the extremity of a long artificial canal; and why an effect which is thought beautiful in India is not to be supposed to be beautiful in England? It may be added that this effect of a long straight canal axial with the centre of the Palace was the actual treatment of the ground in front of old Buckingham House, before the present wriggling piece of water in St. James's Park was made. The forecourt of the Palace is shown laid out in a semicircle with radiating walks and parterres and a series of fountains round the margin of the semicircle; this also is a reminiscence of the former treatment of the forecourt of old Buckingham House. The margin of the canal, between the pedestals, is supposed to be lined with artificially clipped trees at equal distances; and as the canal is at a level considerably higher than that of the St. James's Park lake, the water from it, after flowing through it (for it should be kept at a gentle flow and not left stagnant), could be taken by a concealed sluice to form a waterfall discharging into the park lake, and thus add an attraction to the park.

As in the previous scheme, it is supposed that the roads on each side of the canal and up to the monument should be ordinarily open to the public as a kind of "pleasance," and only closed to them on days of State functions at the Palace. At the eastern end

of the canal the space between it and the Marlborough Gate entrance is laid out as an ornamental parterre, with a large fountain in the centre, which should be an artistic work of the highest class.

That anything on so grand a scale as this should be actually carried out we can indeed hardly hope, though there is absolutely nothing to prevent it except an objection to the cost. But whatever scheme is carried out should in our opinion include these three points—the architectural remodelling of the façade and the forecourt of Buckingham Palace; the diversion of public wheeled traffic from the immediate front of the Palace, and the provision of a more stately, dignified, and secluded approach to it; and the removal of the trees from the western portion of the Mall, in order to clear the ground for an artificial treatment of the site on a grand scale, with which these rather poor and irregularly growing trees must necessarily interfere.

We may conclude with repeating our opinion that there ought to be a sketch competition for the treatment of the site and the design of the monument, open to all British sculptors and architects, before any further steps are taken; and that public feeling will not be fully satisfied by anything short of this.

NOTES.

The Education of the Engineer. "It is plainly impossible, within the short space of three or four years and under academic conditions, to turn out an engineer, architect, or chemist fit for the full responsibilities of his profession." These words occur in the text of an address recently delivered by Principal Galbraith to the students and graduates of the Toronto School of Practical Science—an address which, although brief, is very much to the point. Technical education has been much talked about of late, and by some speakers it almost seems to be regarded as a sort of universal panacea for all ills that may afflict our commercial and professional pursuits. Mr. Galbraith is careful to emphasise the point that while a school can

furnish the student with such advantages in the race for success as will amply repay the time and money spent in acquiring them, yet faithful study for three or four years will not do more than enable him to grasp the main principles upon which his future profession is based. The practical knowledge and training of the engineer can be acquired only when engaged on professional work, as they are dependent far more largely on his own experience than on the experience of others. Until such practical experience has been in a measure obtained Mr. Galbraith wisely insists that "the young engineer should be placed in some subordinate position not entailing more responsibility than he is fit to bear." The commonest weakness of the young engineer, and we may add of the young architect, is insufficient knowledge of the trades. We do not mean to imply that manual skill is necessary, but practical knowledge is essential, so that the engineer or the architect may be able to decide when work is good and when it is bad, that he may know how it should be conducted, and that he should be familiar with the properties which affect the usefulness of any material specified by him. In the address to which we refer it is truly said "this practical knowledge cannot be obtained in the engineering school." A large proportion of civil engineers of the present day have followed the example of their predecessors, and have spent sufficient time in the "shops" to acquire a useful knowledge of practical work. It is quite the exception, however, for an architectural student to undergo a course of instruction in the workshops devoted to those crafts which it will be his ultimate duty to exemplify in professional work.

THE British Congress on Tuberculosis, which will be held in the Queen's Hall from July 22 to 26, will no doubt be chiefly medical in its discussions, but the question of the prevention or diminution of consumption has a certain direct relation with conditions of building, and this has been recognised by providing, in the museum which will be formed in connexion with the Congress, an architectural section in which plans and models of hospitals and sanatoria will be exhibited. Mr. T. W. Cutler is acting as Hon. Secretary of this section. The subjects to be discussed at the Congress include also that of "The Influence of Housing and Aggregation"; under which heading come the questions:—"How far are additional lighting and ventilation necessary to ensure a much higher standard of bacteriological cleanliness, and what additional legislation, if any, is required to render these advantages available?" and "How may cleanliness, with a sufficiency of light and pure air, be secured in factories and workshops, and in places of assembly generally, including steamships, railway carriages, and other means of transit?"

THE Ecclesiastical Commissioners, in pursuance of the Union of Benefices Acts, 1860 and 1898, have ratified a scheme for effecting a union of the two contiguous benefices (both being vicarages) of All Saints and Holy Trinity, Knightsbridge, the consent of the two vestries, the Dean and

Chapter of Westminster, and other parties interested having been obtained. The Commissioners ordain that the church of All Saints shall become the parish church of the united benefice, with the rectors of St. Margaret, in the City of Westminster, as patrons, that Holy Trinity Church shall be pulled down, and that the proceeds of the sale of its site and materials shall be applied towards the erection of a new church, with parsonage-house, upon a site in Prince Consort-road (St. Stephen's parish), South Kensington, which the Commissioners for the Exhibition of 1851 offer for sale. The scheme provides further for the removal from Holy Trinity Church to the new proposed church of all the carved work, fittings (organ by Jones), and furniture, together with such of its monuments, tablets, and antiquities as may not be otherwise lawfully claimed. Holy Trinity Church, Park-side, Knightsbridge, was built (1860-61) by Messrs. Dove Brothers, whose contract amounted to 3,250*l.*, after the designs of R. Brandon and H. M. Eytton (see the illustration in the *Builder* of April 21, 1860). It occupies the site of a district chapel, rebuilt in 1699, which had been the hospital chapel of a lazaret-house appertaining to the collegiate church of St. Peter, in Westminster, which Laud, when Bishop of London, converted into a chapel-of-ease to the parish of St. Martin-in-the-Fields, within the former limits of which it was then situated. The Dean and Chapter of Westminster are still, we gather, the ground landlords, and they are appointed patrons of the new church in Prince Consort-road. All Saints' Church was built fifty years ago, after Lewis Vulliamy's designs, in Ennismore-gardens, so named after Lord Ennismore, who was then living in Kingston House. The interior of the church was decorated by Owen Jones, and it has since been redecorated in sgraffito by, we believe Mr. Heywood Sumner. In August, 1891, the Consistory Court granted a faculty for an enlargement of the church, so as to afford further room for about 200 persons, at a cost of 4,000*l.*

WE were surprised that at the Board of Trade inquiry the subject of the dangerous pressures that exist in several cases between one main of a three-wire direct current system and adjacent water or gas pipes was not brought up by the opponents of the increased pressure. To us it appears the most serious drawback to the change. Engineers state truly enough that a shock of 200 volts is not a very serious matter, although they are careful to avoid them; but we regret to say that some of the London companies allow some of their mains to remain at a much higher pressure than 200 volts from the earth. In Glasgow one of the Corporation mains must always be above 250 volts from earth, and in Manchester and other towns, when testing the mains, the pressure between one of the mains and earth must be dangerous. The Board of Trade rightly prohibit the use of pressures greater than 250 volts between the mains in private houses, but this does not give complete protection from dangerous shocks unless they also prohibit pressures greater than 250 volts between any main and the gas or water fittings. The companies may object that the only way of preventing the pressure between any of the mains and

earth getting higher than 250 volts is increasing the stray currents to earth means of an artificial leak, and that these currents may do serious electrolytic damage to the gas and water mains. This is perfectly true, and shows that the electricians recommended the change over to the high pressure of supply did not take into account all the contingencies that might arise. Sooner or later those London companies who have failed to keep the pressure of the positive mains less than 250 volts from earth will have to adopt some desperate and expensive remedy or completely change their system. In a paper by Mr. Rus recently published in the "Journal" of the Institution of Electrical Engineers, various methods of regulating the pressures of the mains are described, but his conclusion is that those methods can only be applied when the insulation resistance of the work is high. They are, therefore, inapplicable to the older networks in London.

THIS estate, covering 5 acres, which was bought by Lord Churchill in 1897, has just been sold. Known as Wychwood, or Blandford, Park, and watered by a tributary of the Evenlode, it is situated near Charlbury and Woodstock, forming part of Wychwood Forest, a hunting-ground of Henry II., that once extended over 15 square miles. The property belonged to Elizabeth, to Robert Dudley, Earl of Leicester, and subsequently to the Danvers, advanced Earl of Danby; was then owned by the Hydes, Earl of Clarendon (who thence took their seat in the title of Viscount Cornbury), and afterwards by George, third Duke of Marlborough, whose son Francis was elevated to the rank of Viscount Cornbury in 1815. In his diary for October 17 and 18, 1664, Evelyn records visits to Cornbury in the company of Henry May and Viscount Cornbury to help in the planting of the park. Evelyn describes the present house as being

"lately built by the Earl of Denbigh [sic] in the middle of a sweet park, walled with a dry stone wall. The house is of excellent free-stone abundance of that part, a stone that is fine, but never sweats, and casts any damp. . . . We designed a handsome chapel that was yet wanting, as Mr. May has stables . . . having set out the walks in the park and gardens."

In Nicholas Stone the elder's MS. book of his own works are some entries (1664) which relate to his share in the building of the house. He writes:—

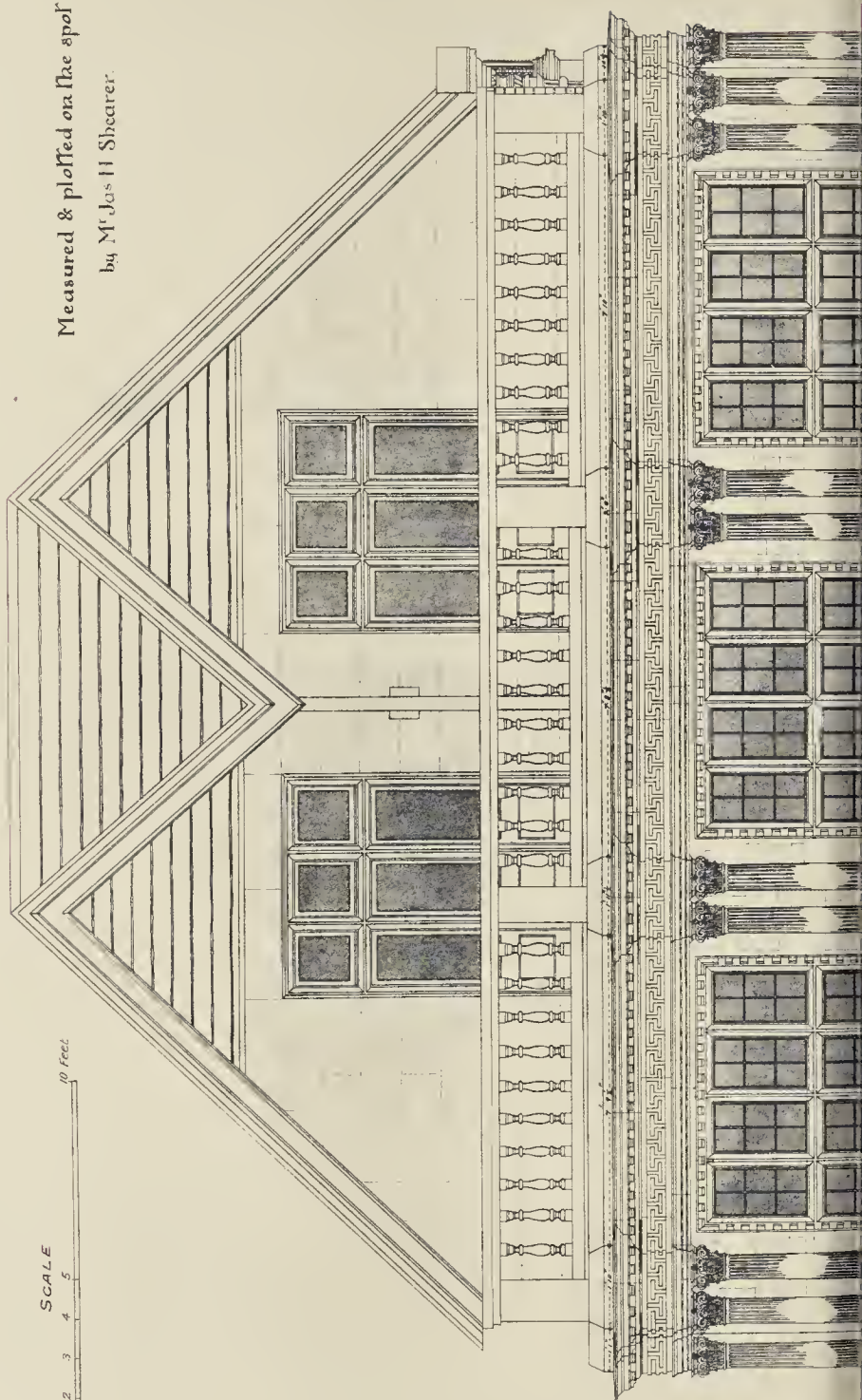
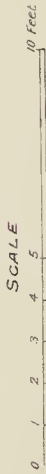
"Agreed with the Right Honbl. Lord Earl of Danby for to mak 3 ston gattes in to the park garden, Oxford, and to desine a new hows for at Corebury in Oxfordsheer and to deruch workmen and mak all thar. . . I was thar in 23 times and my covenant of acord with his lordship was 1,000*l.*"*

In or about 1630 Timothy Strong built the south front, with the cellars, great hall, and some adjoining rooms. Thirty years afterwards his son Thomas built, under Henry May's directions, the stables fronting Cornbury and the part of the house and terrace fronting Oxford. A drawing by Neale shows the house as having two floors and an attic story, with a tetrastyle portico and an apediment in the middle of the principal front.

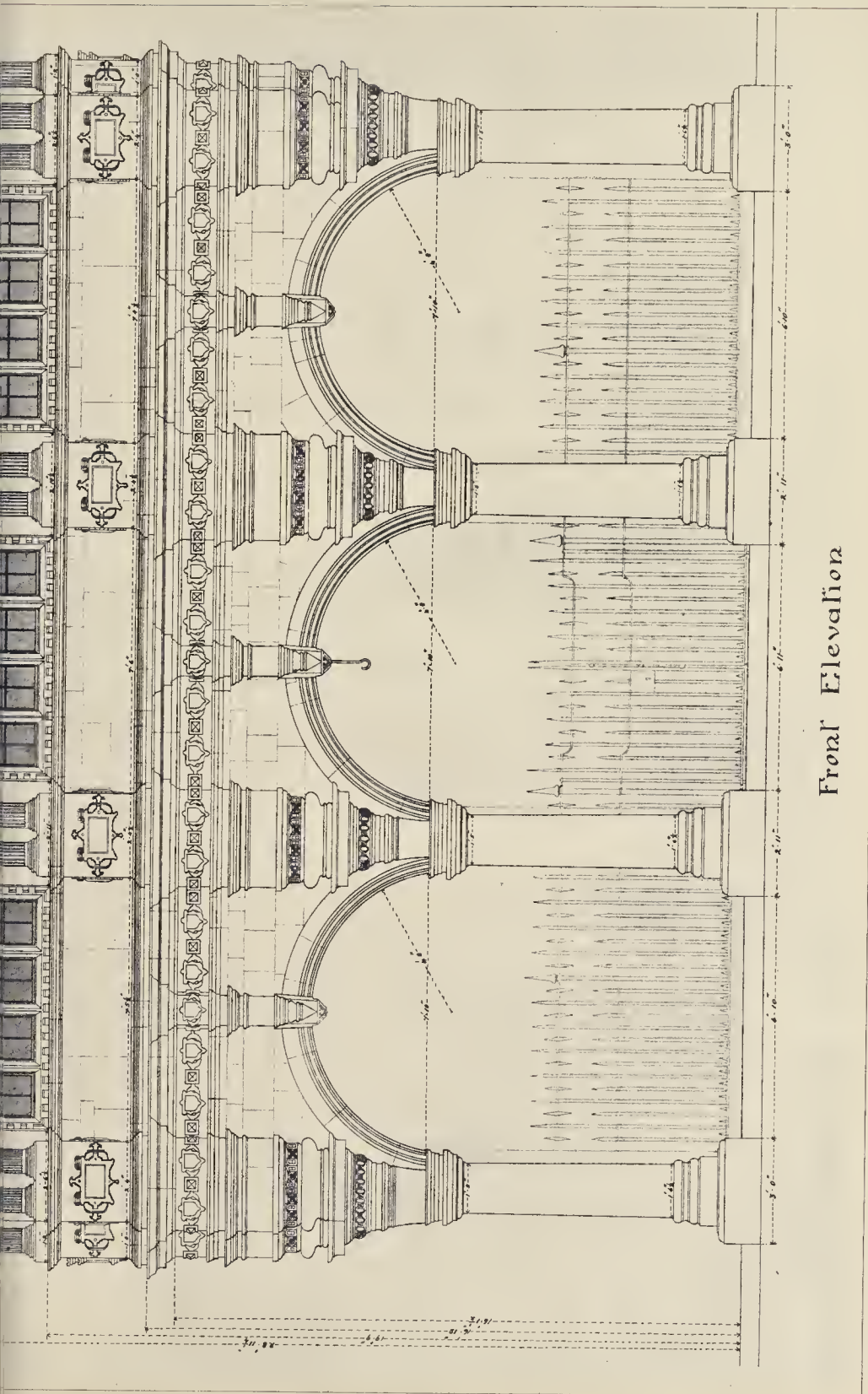
* Lord Danby, *obit* 1644; Stone, *obit* 1647; Hyde was advanced Viscount Cornbury and Earl of Clarendon on April 22, 1661.



~ The Guildhall ~ ~ Exeter ~

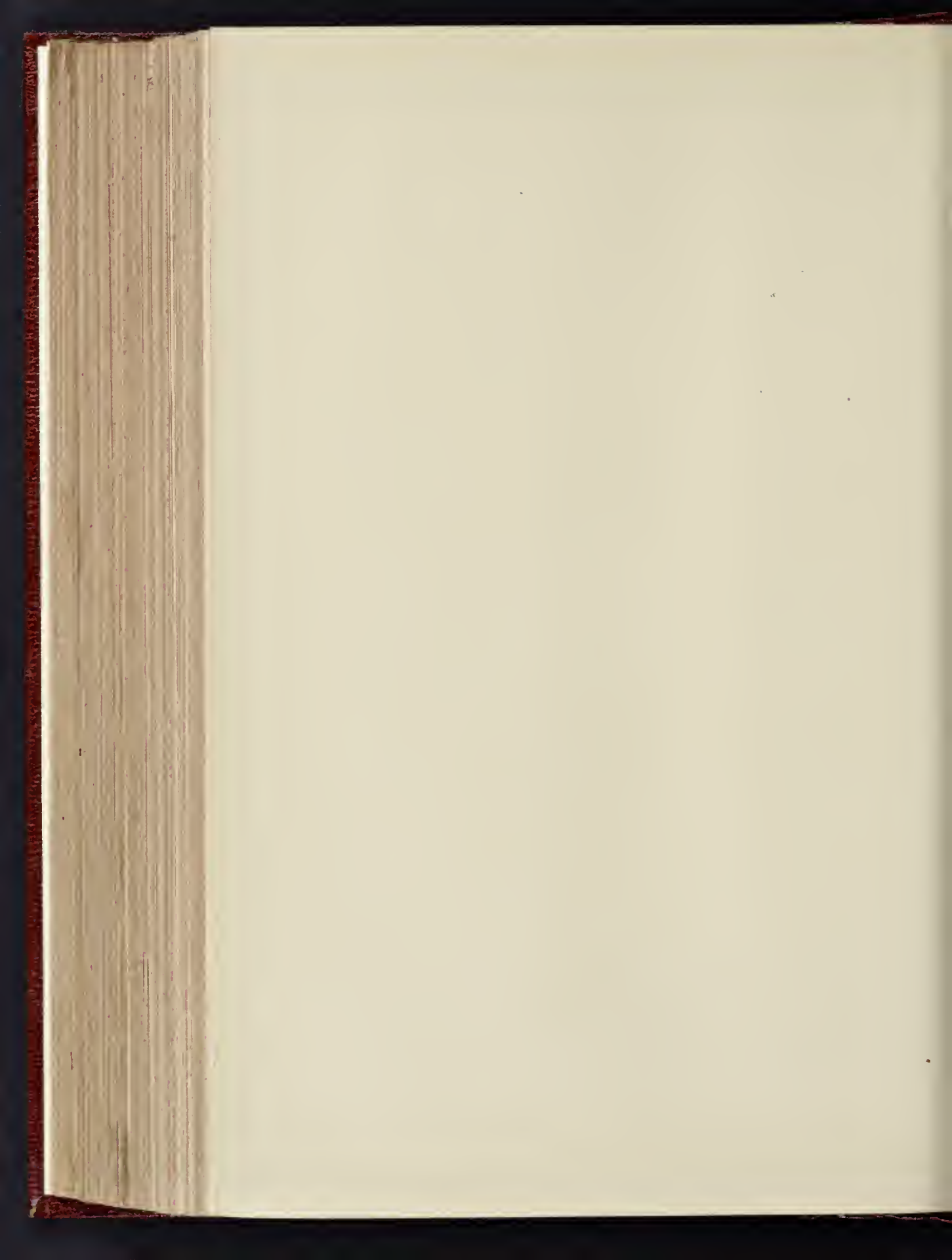


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Front Elevation



ACCORDING to Dr. Fletcher's Report to the Local Government Board upon the sanitary circumstances of the Farnworth Registration Sub-district of the Bolton (Lancs.) Registration District, and upon the sanitary administration of the Farnworth and Kearsley Urban Districts, it seems that the Medical Officers of Health of these two sanitary areas have not been under the Board's order. Copies of the annual reports of the Medical Officer of Health for Farnworth have not been submitted to the Board, and those sent by the Medical Officer of Health for Kearsley have been deficient as regards the kind of information desired by the Board. In view of the above facts, the Board deemed it advisable that both districts should be inspected by one of their medical staff. Dr. Fletcher's Report gives much the same conditions for both districts. They are supplied with water from the mains belonging to the Corporation of Bolton; water derived principally from upland surface gathering grounds, the condition of which appears to permit certain opportunities of contamination of the supply. The almost universal method of excrement and refuse disposal is by means of privy-middens, all wrongly constructed. They are sunk beneath the ground level, most of them to a considerable depth; are very large, being capable in most instances of containing accumulations of refuse and nightsoil during a period of several months without becoming full. Excepting such nightsoil as is received by farmers, nightsoil and house-refuse are disposed of at one or other of the tips in the district. This is done by contract, and the method is to throw out into heaps on the surface of the ground the contents of several middens, and then to shovel the filth and refuse into carts. Thus in a back street may be seen several large heaps of stinking material at one and the same time, and the method involves not only grave nuisance during the process, but serious pollution of the ground surface and nightsoil. One is not surprised, after this, to read the following conclusions in the summary at the end of Dr. Fletcher's report. Mentioning some special causes of the prevalence of diarrhoea in the district, he continues:—

"But there are also other causes which exert a powerful influence on the prevalence of autumnal diarrhoea, and greatly encourage its local incidence and persistence. Chief among these are unwholesome circumstances, and especially such as are associated with pollution of the air and soil by decomposing animal and vegetable substances, and among such the foremost rank must be given to excremental material. These unwholesome conditions, moreover, are precisely those which encourage also the development, prevalence, and persistence of enteric fever. They have been shown to exist extensively throughout both the districts under consideration, and have undoubtedly had a large share in inducing diarrhoea, and in developing and maintaining infected material outbreaks of enteric fever, and in fostering the disease in an endemic form in the locality. If the district councils continue to permit the existing unwholesome conditions, the districts will probably suffer a penalty similar to those experienced in other places where like conditions have not been removed—The endemic disease may assume epidemic proportions with a correspondingly enhanced mortality."

This once pretty suburb has suffered many changes during the past few years. Amongst the buildings that have lately disappeared we may cite the old Greyhound Inn, established in

the former half of the eighteenth century, and twenty years ago was pulled down the Old Manor House wherein Edward Alleyn lived when engaged upon the founding of his College of God's Gift—completed in 1619, after designs attributed to Inigo Jones. Shortly afterwards the late Charles Barry, as architect to the College estates, laid out the Manor House property, extending over fifteen acres, for the building of villa residences. Alleyn first became a landowner in the parish of Camberwell in 1605. On March 5, 1885, was sold at Messrs. Puttick & Simpson's auction rooms the reputedly genuine agreement for the leasing of lands in the Manor of Dulwich to Edward Alleyn by Sir Francis Calton, signed by both parties, and dated October 3, 1605.* Another old landmark is doomed, being Rosendale Hall, erected, it is said, in 1658, and sometimes visited by Charles II. At Rosendale Hall was discovered a medicinal spring, which became so popular that the Green Man hostelry was opened for the reception of visitors; it was subsequently occupied by Lord Chancellor Thurlow.

It is to be feared that a large proportion of the contents of this exhibition can only be described as curiosities, mostly of a rather unattractive character. We pass by, one after another, half-finished sketches of landscape in grimy tones, and figure-subjects and portraits in which the object seems to be to get the ugliest persons possible as sitters, or to make them as ugly as possible. The latter must be the true explanation, for we doubt if there are any as ugly women to be found in real life, at least among those who live in drawing-rooms, as are shown here in more than one picture of "An Interior," or some analogous title. Occasionally we come across a rough sketch, like that of Mr. George Thomson's of "Penrice Castle," in which the artist, like Polygnotus, seems to have thrown his sponge at the paper with a happy accidental use of the right masses of colour for a bright landscape effect from which all detail is omitted. Mr. Clarkson in "The Bean Harvest" has got an effect of light in the sky, and Mr. Alfred Thornton's "Lombard Landscape" suggests the sentiment of poplars and clouds without any commonplace realism of effect. At last the eye catches sight of a picture—an actual picture! of "The Pool" with foliage reflections, and bearing the name of a real artist, Mr. Mark Fisher, and quite in his best way. But what does such a painter as he do in this gallery? We might put the same question to Mr. Furse, whose portrait of "Mr. Dodgson" is a reasonable picture; but in his larger work at the top of the room he seems unfortunately to have succumbed to the prevalent mania. Among the other pleasant exceptions are Mr. W. W. Russell's "Edge of the Forest," a landscape of some power, and the same artist's "A Holiday"; Mr. Fry's "St. George," a kind of archaeological whim, but amusing and clever in its way; Mr. Conrad's half-length "Portrait" of a young lady, pretty for once, and with a quiet repose of colour and treatment; and Mr. J. Henry's "The River Bar," a small coast

* In his "Dulwich College and Edward Alleyn" (1877), Mr. Blanch describes the deed as being the oldest document in the College respecting Alleyn's purchase of the manor. Mr. G. F. Warne's catalogue (1886) of the College MSS. says: "The original of this document has been lost."

landscape marked by clear and atmospheric effect. What is the aim in the majority of the landscapes hung, or what kind of pleasure we are expected to find in them, it is indeed not easy to understand.

MAGAZINES AND REVIEWS.

THE *Art Journal* contains an article by G. Montbard, illustrated by his own sketches, on "Fez, the capital of Morocco," which is to be continued. It gives us some glimpses of a little-known city. There follows an article by M. Day on "Cloth Bookbindings" and their susceptibility to artistic treatment. They can never have such a monumental appearance as stamped leather or vellum, but there is certainly no reason why artistic design should not be applied to them. Considering, however, that the material is much less lasting, the design should not attempt too much—it is not worth while. The simple design for the back of "Willow the King," gold on linen, with merely the plain but well-designed lettering and two or three bits of small spray ornament to fill up the outline of the lettering, ought to have an excellent effect (the illustration of course does not show the colour or the gold). Some of the illustrations remind one of the importance of having the feeling and style of the decoration in keeping with that of the book. The cover to "Gryll Grange," with a decorative peacock forming the prominent feature (Peacock being the author of the book), and that to "Pharos the Egyptian," with the Egyptian winged and snake-headed globe beneath, are suitable enough; but the cover for "Jacob Faithful," a conventional decorative treatment of an ancient gallery, is an absurd decoration for such a modern "old salt" story of sea life, and would have puzzled Marryat very much. The special number of the *Art Journal* is devoted to the life and work of Sir John Tenniel, the letterpress by Mr. Cosmo Monkhouse; the illustrations numerous and well chosen; the pathetic cartoon "Dropping the Pilot," perhaps the most memorable of all Sir John's *Punch* illustrations, forms the frontispiece. The Paris Exhibition supplement is still continued. It serves to remind most visitors, we fear, how much there was at that wonderful show which they missed seeing.

The most interesting article in the *Magazine of Art* is that on "Decorative Art in Belgium," by M. Octave Maus. From this article it would appear that there is quite a movement in Belgium for the decorative treatment of house fronts from designs by the architects, and also for furniture and the designs of entire rooms. By the decorative treatment of house fronts we mean the application of flat ornament on spaces defined by the architectural features. The two men named as most prominent in this movement are M. Paul Hankar and M. Victor Horta. English architects should read this sketch of the modern art-movement in Belgium. There is also an illustrated article on the decorative work in the new station of the Paris and Lyons Railway Company in Paris, to which reference has before been made in these columns. In introducing landscape as decoration—views of the places connected with the Paris-Lyons railway service, some at least of the artists have been very successful by a system of combining these landscape views with an architectural style of decorative design, which forms the framework through which they are seen, so that the landscape becomes only a filling up of spaces in a decorative design the main lines of which are completely architectural. This is a far better system than merely painting a landscape in flat style on a wall and calling it decorative.

The *Architectural Review* (Boston) contains among its illustrations some portions of Messrs. Cope & Stewardson's competition design for Washington University; very pretty drawings, looking almost exactly like sketches of some old Elizabethan building in England, an effect enhanced in one of the drawings by showing the wall half-covered with ivy; an appeal to sentiment which seems hardly fair. Messrs. McKim, Mead, & White's "Slate Savings Bank at Detroit" is a well studied one-story Classic design looking very like a bank, shown entirely in geometrical elevation and sections; the plan, however, is wanting. It is commendably honest to show in the elevation the hipped-leaded roof rising behind the balustrade, but nevertheless it spoils the look of the design, and in regard to this as well as many other

similar cases one is tempted to ask why, in these days of girders and concrete, a flat roof should not be made, and this interference with the main character of the design avoided. The balustrade is a feature which in itself suggests a flat roof, and, in fact, has little meaning apart from it. The editor takes exception to our remarks in the leading article of the New Century number of the *Builder* that the Gothic revival has run its course, and thinks that on the contrary its course has only just begun. If he lived in England he would know better. We are aware that Americans have not done with the Gothic revival; but it is certain that the English have. The principal article in the number is by an English architect, Mr. E. P. Warren, a long and interesting illustrated article on "Decorative Plaster-work."

The *Berliner Architekturwelt* contains illustrations of a considerable number of examples of recent German architecture, of which the most important is a *Kaufhaus* or mercantile warehouse by Herren Stiehl & Kampffmeyer, of Berlin; a building with a good deal of character and carefully treated in detail. The other examples are chiefly of villas and street architecture. There are also a good many designs for the interior decoration of rooms and for furniture which are of considerable interest and suggestiveness.

In *Fallden's Magazine* Mr. Twelvetrees brings to a conclusion his valuable scientific account of the construction of the Central London Railway. To the same issue Mr. W. H. Maxwell contributes an article on the important subject of "The Town Refuse Problem," and its relation to steam production. This gives valuable practical information, with sections, as to the structure and principle of various forms of refuse destructor. The article is to be continued in future issues. The main problem with which it deals is the extent to which refuse can be made commercially valuable as a heat producer.

The *Studio* (March 15) contains an article on the works of Mr. J. M. Swan, with a number of illustrations of his animal studies and paintings, and one on the curious subject of Japanese tobacco-boxes, with illustrations. An article by a lady "On Some Modern Cottages," with illustrations which are all of one school, and that the school of what we call the contrived picturesque. Articles on such subjects should be written by practical architects, not by lady amateurs, who look at the subject only from a sentimental point of view.

The *Artist* contains an article on "Book-binding," by Mr. Kineton Parkes, with some good illustrations, and one on John Martin and his works, by Mr. E. Wake Cook, who seems to have constituted himself the champion of this pinchbeck genius. Mr. Cook seems to think one reason that Martin does not take a place alongside Turner is that he has no fair representation: "Turner's works are everywhere in evidence; Martin's might be nonexistent." That is confusing cause with effect. Martin's works are nowhere because no one cares to have them.

In *Scribner* ("The Field of Art") Mr. W. H. Low gives an account of "the story of a painted ceiling" in an ordinary-sized private house, with a ceiling 13 ft. from the floor. The account of the gradual manner in which the treatment was arrived at, and the prejudices of the client softened down, is very well given, but the most interesting point in the article is the remark quoted from Pavis de Chavannes in regard to his decoration for the Hemicycle of the New Sorbonne. The story is told to illustrate the importance of being familiarised with your apartment before you set about a painting in it. What the great French decorative painter said was this:—

"When I was asked to do the Hemicycle of the Sorbonne I arranged to pass the better part of my days in the hall and before the space which my painting was to occupy. There I stayed, studying the lighting, the proportions of my panel, its distance from the spectator, until, little by little, the vision of my picture appeared to me, so very like what I ultimately placed there that you would be astonished could you see it as I did."

The *Century* contains a picturesque and at the same time practically interesting article by Mr. Wolden Fawcett on "The Transportation of Iron," the means by which the fresh-mined ore is within a week transported twelve hundred miles, by land and sea, to the furnaces in Pennsylvania and Ohio. The following quotation gives a good idea of the scope of the article:—

"It is a marvellous transit, this trip a third of the

way across the continent, and the journey itself is not more wonderful than the vehicles in which it is made. The flying trip is made by rail, then by boat, and finally by rail again; and it might be made even more quickly were it not necessary to lose a day and a half 'changing cars,' so to speak, although in reality, of course, the transfer is from cars to the monster freight-carrying vessels of the Great Lakes, and thence back again from the leviathans of the inland seas to the metal wagons of the steamroad. Of a part of the ore it may be said that from the time it leaves the hills of the northern wilderness until it is set down in the smoky valleys that lead up from the Mississippi, not a human hand touches it. Powerful mechanical shovels, doing the work of scores of men, place it aboard the cars at the mines; gravity carries it to these ungainly carts to the hold of the fresh-water ships; and, when the voyage is ended, ponderous arms of steel, impelled by steam, delve into the hold and draw out at a swoop sufficient of the fine-grained material to fill several of the largest farm-waggon's."

In the same number Mr. Birrell continues his amusing and characteristic article "Down the Rhine," in which we are asked to look at a good many things from a new point of view. He gets to Cologne in this article, and is greatly impressed with the cathedral, especially its scale. "The great door is 93 ft. high and 31 ft. wide. These figures are comforting and inviting." "The materials that go to compose the flying buttresses alone would build cottages for ten thousand men." Has Mr. Birrell worked this out, or is it only a local cicerone's tale? Scale, however, is not everything in architecture, and Mr. Birrell quits Cologne without a word for St. Gereon—a parlous omission. "Old Manor House Gardens," by Miss (or Mrs.) Nicholls, is a rhapsody on old gardens to accompany some illustrations.

The *Nineteenth Century* includes a short article by M. de Soissons on "Augustin Rodin," one of those rhapsodies in which it is now the fashion to indulge over the wrong-headed and fantastic works of a man of genius who has forsaken the paths of true art for those of sensationalism. Among other things which we are called on to bow down before is that confused and unintelligible plaster sketch called "The Gates of Hell," which was to be seen in the Rodin pavilion next the Paris Exhibition, and over which we are told the artist has been at work for ten years. Of course the preposterous so-called statue of Balzac comes in for the usual adulation. It would seem that sculptor and critics (?) have alike lost their reason.

The *Gentleman's Magazine* contains an article by Mr. Karl Blind on "Sir F. Barry's New Excavations of Brochs," those ancient and puzzling strongholds in Scotland to the remains of which special attention has recently been directed. Sir F. Barry has discovered eight in the neighbourhood of his own castle, "in places where no one had guessed their existence underground, so imperceptible did the marks on the grass-grown soil appear to the ordinary eye"; and the author, not without apparent reason, calls him "the Schliemann of Caithness." The same number contains a short article on the interesting subject of the old-fashioned "Semaphore Telegraphs," and one by Mr. J. Ellard Gore on "Recent Advances in Stellar Astronomy." He remarks on the great assistance given in recent times by the increasing number of amateur observers. One point touched upon at the close of the article is of special interest in connexion with the recently observed new star in Perseus, viz., the possible cause of these occasional outbreaks of flaming worlds. Mr. Gore supports Mr. Monck's theory, that these are dark or only faintly luminous bodies which acquire a shortlived brilliancy by rushing through some of the gaseous nebule which exist in space, as shooting stars take fire by rushing through our atmosphere. The comfortable reflection is added that if our own sun passed through such a mass, its heat and light would be vastly increased by the friction. In such a case there would be a literal fulfilment of the prophecy, "The earth also and the works that are therein shall be burned up."

The *Pall Mall Magazine* contains an exceedingly practical article by Sir William Richmond on London fog and smoky chimneys, the special point being to urge the unrelenting application of the power to fine proprietors of factories which are allowed to emit smoke from their chimneys, supplemented with the argument that the proprietors themselves would find more perfect combustion of their fuel a saving in the long run, and that the fines are really in their interests as well as in those of the public. He shows that in some cases the

authorities who have power require a great deal of external pressure put upon them to induce them to exercise their legal powers. It appears to us however, that to head the article "The Black City" is somewhat sensational—London can look bright enough in favourable weather; and the photographs which accompany the article appear to have been purposely taken under conditions of light such as to give the greatest possible dinginess of effect. The cause does not need these adventitious aids, which are rather apt to produce the opposite effect to what is intended. The same number contains a translation of posthumous article on Millet by the late Charles Yriarte; interesting, but not marked by any thoughtful criticism as to the position which Millet will permanently occupy in art. Ultimately it will probably be recognised that the value set on Millet's work at the close of his life and after his death, has been somewhat exaggerated. The same number contains an account of the making of the Uganda railway, which has been carried on not without practical opposition from natives, white ants (which attacked the telegraph poles), and lions. One of the latter animals was found one morning on the platform of one of the carriages, apparently waiting for the train to go. As he "refused to show his ticket," and was unfriendly in his demeanour, he was promptly shot. The difficulty with the white ants was got over by transplanting living trees for telegraph-poles, which the ants do not attack.

Knowledge, as may be expected, contains an article on the new star (so-called), in respect to which there is offered a variation on Monck's theory referred to by Mr. Ellard Gore (see above), to the effect that the blaze is due not to a body like the sun passing through a nebula, but to the passage of a dense swarm of meteorites through the sparser swarm composing a nebula; "the denser swarm, on this view, is responsible for the dark line spectrum and the sparser one for the bright lines." It is expected that there will be opportunity for much further study of the spectrum of the *nova*, which may afford further evidence for one or other theory.

Moring's Quarterly contains an article, with some illustrations, on "The Roman Camp at Birdswood," the largest camp on the line of the Roman wall.

The *Home Counties Magazine* (quarterly) contains several articles on subjects of archaeological interest in the neighbourhood of London, among which "A Walk by the Brent," by Mr. J. P. Elmslie, may be specially mentioned.

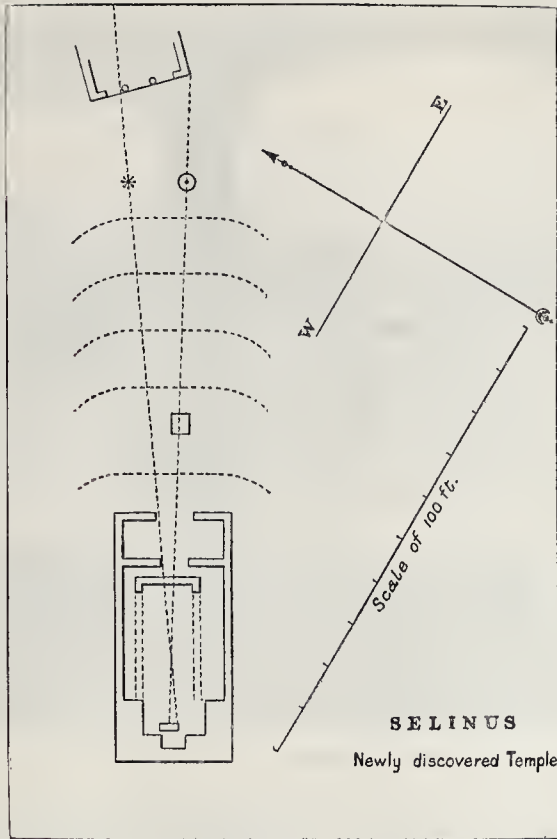
The *Quarry* contains an article on "Some Norwegian Building Stones" to which considerable additional interest is given by views of a number of buildings carried out in various varieties of Norwegian granite and stone; the material being specified beneath each illustration.

Climate, a small quarterly journal, gives an account of a rather interesting competition, initiated by the journal in question, for the best design (constructively) for a house suitable for European residents in tropical climates. They received four designs, of which what were considered the two best are published, with some particulars as to the methods and materials recommended, and the criticisms of the Committee of Selection. Those who are about to build houses in a tropical climate may find the report useful.

COMPETITIONS.

HEARTS OF OAK NEW OFFICES.—A two days' meeting of the delegates of the Hearts of Oak Benefit Society was concluded on the 9th inst. at the offices, Charlotte-street, Fitzroy-square. The Council submitted a report, which was adopted, stating that they had purchased for 30,000l. freeholds in Euston-road and Grafion-place as a site for new offices. They recommended that the leases of a third of the premises should be purchased for the erection forthwith of suitable offices. It was decided to offer premiums of 100l., 75l., and 50l. for the best designs of suitable buildings, the cost of which should not exceed 55,000l.

VOLUNTEER DRILL HALL, LEITH.—A drill hall and headquarters for the 5th V.B. Royal Scots, Leith, have been erected in Dalmeny-street, Leith. The hall is 160 ft. by 84 ft. The architect was Mr. F. G. Simon, of Messrs. Anderson, Simon & Crawford, of Edinburgh.



THE ORIENTATION OF GREEK TEMPLES.

The following is an abstract of a paper recently read by Mr. F. C. Penrose before the Royal Society:—

The paper contains notes on two examples from Greece and four from Sicily—of these, three are of the nature of amplification and correction, and three are fresh cases.

1. To the second head belongs a rude and archaic shrine in the Isle of Delos; not improbably the most ancient existing example of a religious structure on Greek soil. It exhibits the usual stellar connexion with its orientation and an approximate date conformable with its remote antiquity (1530 B.C.).

2. Some further observations on the Temple of Apollo, at Delphi, of which the recent complete clearance of the site admitted of measurement with greater exactness than before.

3. At Syracuse I found that the architecture of the temple, which has been erroneously attributed to Diana, was of a character much too archaic for the date assigned to it in that paper, which had been derived from the orientation of the axis; but that when taken from the northern limit of the eastern opening the date would be quite consistent both with architecture and the history of the town.

4. This led to a re-examination of the other Syracusan examples and an error was discovered, altering the orientation of the temple attributed to Minerva, and its derived date, from 815 to 550 B.C., to its great advantage in every respect.

5. The most interesting example, however, is from another Sicilian temple lately unearthed at Selinus. Of this temple I found the orientation of the eastern axis to be 30 deg. 22 min. north amplitude, which at once suggests a solar temple arranged for the summer solstice, which for a level site and for the date in ques-

tion, should be 30 deg. 35 min. But the temple's site is near the bottom of a valley; and the sun would have to gain an altitude of rather more than 2½ deg. before it could shine into the temple; and then the amplitude required would be 28 deg. 17 min. Thus apart from what may be derived from the plan of the temple itself, the orientation theory would seem to show to a disadvantage. At the same time the peculiarities of the plan of the temple would be difficult to explain without the orientation theory.

Presumably the angle upon which the lines of the temple were set out was taken from data obtained on some platform which had a level horizon, and the building was considerably advanced before the actual solstice came round and showed the error that had been made.

To meet the difficulty a *naos* was constructed within the flank walls, but hugging the northern one; so that the first beam of sunrise coming through the centre of the eastern aperture, at the local amplitude of + 28° 17' E., might shine in centrally upon the Statue of the Deity; and for this a pedestal was provided a little northwards of the centre of the niche which had been previously formed for it. We may notice also that the south-west angle of the Propylea is so placed as to keep exactly clear of the point of sunrise.

6. An argument is drawn from the orientation of the foundations of a small temple lately discovered, adjoining the famous theatre at Taormina, that the theatre itself was that of the city of Naxos, which occupied the sea-coast at about 800 ft. immediately below it; and not the work of the much later town of Taorminum, from which Taormina derives its name.

NEW WING, NURSES' HOME, KIRKDALE, LIVERPOOL.—On the 26th ult. a new wing, which has been built at the North Home of the Liverpool Queen Victoria District Nursing Association at Kirkdale was opened. The architects were Messrs. Rathbone & Beckett.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association visited Sauchie and Clackmannan Towers on the afternoon of Saturday, April 6—the former through the courtesy of the Earl of Mansfield, and the latter by permission of the Marquis of Zetland. The leader at Clackmannan Tower was Mr. A. F. Balfour Paul, who gave a description of the old castle, and recalled its historical associations. The party then drove to Sauchie Tower, where Mr. John Watson acted as leader, and exhibited some measured drawings which he prepared many years ago before the topmost portion of the tower was demolished. The castle and the old cottages adjoining were then examined and described.

CARDIFF, SOUTH WALES, AND MONMOUTH-SHIRE ARCHITECTS' SOCIETY.—On the 3rd inst., at the Royal Hotel, Cardiff, this Society held a supper to mark the close of the session, Mr. George Thomas, the President, being in the chair. Since the end of October the members have heard the opening address of the President and papers by the following gentlemen:—Mr. W. H. Ashford ("The Orders of Architecture"), Mr. W. H. Dashwood Caple ("Sanitary Building Construction"), Mr. A. Gladding ("Wren's City Cathedrals"), Mr. C. B. Fowler ("Interesting Portions of Ancient Architecture in the Diocese of Llandaff"), Mr. H. Sesom Hiley ("Architectural Training and Education"), Mr. J. Coates Carter, and Mr. J. H. Phillips ("Holidays on the Continent"). Among the toasts given at the supper were "The Chairman," submitted by Mr. H. S. Hiley, and responded to by Mr. George Thomas, and "The Guests," proposed by Mr. H. C. Rimell and acknowledged by Mr. W. H. Dashwood Caple, who mentioned that last year thirty Associate members were elected, and urged the desirability of the younger members of the profession settling themselves to downright work if they meant successfully to meet outside competition. A smoking concert was held after the supper.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The fifth lecture of the course on "Works Management" was delivered by Mr. A. H. Barker at the Westminster Palace Hotel on April 3, the Chairman of the Institution, Mr. Percival Marshall, presiding. The method of calculating piece-work prices was considered, figures relating to the product of lathes, shaping, and other machines being given, and diagrams were exhibited embodying results from actual practice. The necessity of exact records being kept relating to each process of a job was urged. Time-sheets and books were described, and the system of keeping them dealt with in detail. Reference was made to the advantages to be derived from a special rate-fixing department where devices could be submitted for executing standard jobs in the most expeditious manner in the works proper. The premium system was further alluded to, and the lecturer proceeded to the question of cost-keeping, the respective operations of the estimating and costs' office being traversed, including tabulating, book-keeping, indexing, &c. Considerations with respect to invoices in both directions were entered into, and systematic methods for the avoidance of errors, and of unbusinesslike occurrences in connexion therewith, were indicated.

PUBLIC IMPROVEMENTS, GREAT YARMOUTH.—On the 29th ult. at the Town Hall, Yarmouth, Lieut.-Colonel A. C. Smith, R.E., an inspector to the Local Government Board, held an inquiry into applications by the Corporation for permission to borrow 7,500l. for foreshore improvements at Gorleston, and 2,580l. for paving works. It was stated that the Corporation propose to acquire 2,394 ft. of cliff at Gorleston, and the slope of the cliff for the same length. The top of the cliff was to be levelled and laid out as a promenade, and the cliffs would be sloped off down to the beach, giving a gradual approach. The existing concrete sea-wall at the foot would be extended. The Corporation would have the right to erect shelters and lavatories, pavilions, and other structures below the level of the sky-line, but on the top of the cliff nothing must be erected that would obstruct the view from houses that might be erected on an estate on the cliff. Evidence was given by the Borough Surveyor. The paving works loan was for the formation of concrete paths in place of existing gravel paths.

* "Additional Notes on the Orientation of Greek Temples, being the Result of a Journey to Greece and Sicily in April and May, 1900." By F. C. Penrose, M.A. F.R.S. Received January 17.—Read February 14, 1901.



Formal Garden seen from Colonnaded Vestibule

THE ARCHITECT AND THE GARDEN.*

WHEN our late Hon. Sec. first asked me to read a paper before the Discussion Section I told him that it was not possible for me to rise to the high level required, but, like the impertunate widow, he refused to take "No" for an answer, and at last, weakly, I gave in.

If I thought it a difficult matter a year ago, much more have I found it so now, when so much has been said and written on the subject of gardens, and when there is at the present time a distinct and almost general revival of garden craft and design. I must, therefore, beg you not to expect anything new or original from me either in fact or theory. All I have endeavoured to do is to again call fresh attention to the intimate relation between the house and the garden, and, therefore, consequently between the house designer or architect and the garden.

That these important relations are almost entirely overlooked or unknown by the general public is, I think, a truism which we all realise, but it seems to me more than possible that this ignorance is, perhaps, due to the architect himself, who has in the past failed to make use of opportunities which must present themselves to him when he is called in to design a new home or, perhaps, to alter an old one. I mean architects generally as a body have failed to study garden craft and garden design, or to realise how great is the connexion between house and garden from both the practical and æsthetic point of view.

The vast number of amateur (so-called) garden books, the several excellent architectural ones written within the last few years, and the more or less ready sale which they command are sufficient evidence of the awakening interest which is being aroused, both in the public and professionally, in this, to me, most fascinating of all the allied branches of our art. It behoves us, therefore, to be on our guard, and to be fully prepared with reasons why the architect's jurisdiction should extend to the garden, and to see that our knowledge is founded upon sound principles. I do not propose, therefore, to go much into

* A paper by Mr. H. P. G. Mauls, read before the Discussion Section of the Architectural Association on the 13th ult.

the question of garden design, or what may be right or wrong in garden design. I would rather dare to paraphrase Kipling's ballad, "In the Neolithic Age," and say "There are nine and sixty ways of constructing garden lays, and every single one of them is right"—so long as we keep before us the spirit of the old English garden, and understand the principles which underlay its formation and development, and realise the reasons why an architect's education should include a study of garden craft. Perhaps here, at the outset, I had better say what I personally conceive those underlying principles to be.

First of all, then, I shall say *seclusion*. For if this was not the great aim of the old gardeners, it is an end which has certainly been attained: and it is at least interesting to find that the original meaning of the word garden in almost every language was "an enclosed space," and in the Greek word "kortos" a secondary meaning was a feeding-place. The brick wall with its green crusted coping, the close clipped hedge, defying the prying eyes of the curious, high trellis-work with its entwining creepers, all point to this end, and while serving the useful purpose of giving shelter to fruit and flower, wraps the whole garden with a tranquil air of seclusion, security, and mystery. This was well understood in the seventeenth century, and is, I think, clearly the reason why Georgian houses were so often placed close to the road in order to give more space and seclusion to the gardens lying behind them.

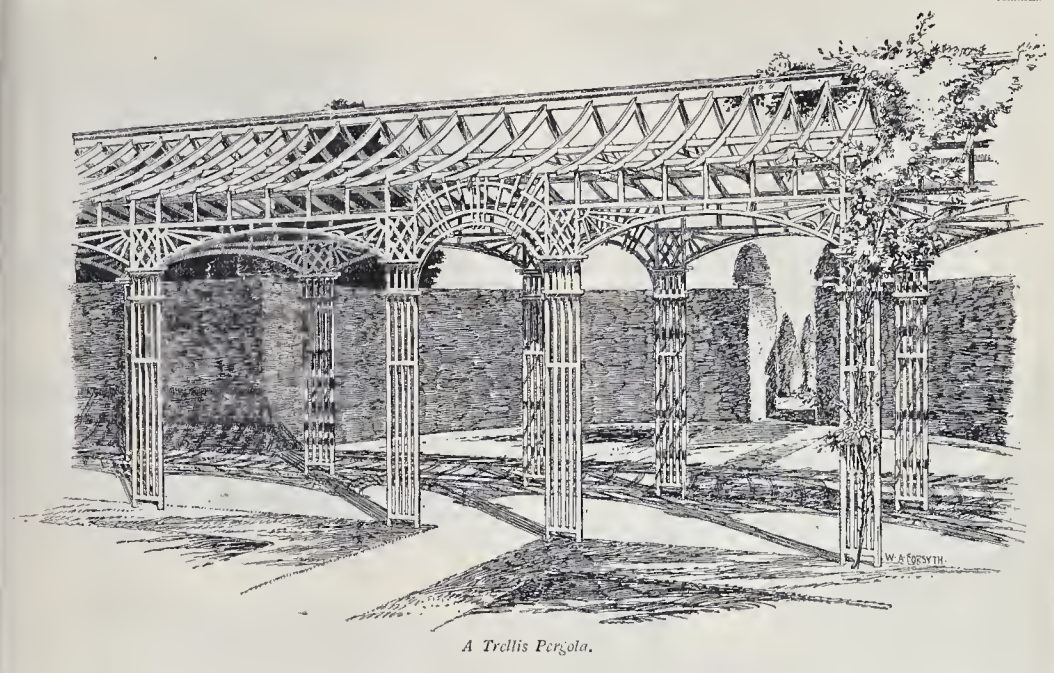
After seclusion comes *use*. Gardens were not made merely for pleasure, but to provide the home with necessities and delicacies elsewhere unattainable. Fruit growing was a fine art. The bakehouse, brewhouse, game larder, fishpond, dovecote, herb garden, walled fruit garden, orchard, quincunna, and stillroom were necessities, and not merely evolved out of playful fancy.

For instance, there is, I think, no doubt that the fishpond or tank owed its origin in mediæval Catholic England to the demand for fish, and hence the development and charming treatment of these ponds in later times. The ladies of the household were experts in all that pertained to garden produce, and the recipes of our great-great-grandmothers

would probably considerably astonish their twentieth century descendants. The old-fashioned herb garden must not be forgotten. The culture and curing of "simples" was formerly part of a lady's education, and gardens were oftentimes renowned for this feature alone. Evelyn says, "We walked into a large garden esteemed for its furniture, one of the fairest, especially for simples and exotics." Then also the necessity for good, dry paths and terraces, for it was in the garden that exercise was "largely taken." Roads were few and bad, and ladies no doubt disliked mud as much then as now.

The garden was therefore an integral part of the home—indeed, an absolute necessity—for modern conditions were unknown, and if the household was not self-supporting it could barely exist. Thus garden and house grew up and were designed together, for each was the complement of the other. Thus, I think that the keynote may be said to have been necessity, to which was doubtless added a real love of beauty for its own sake, prompting those quaint fancies which help to enhance the charm and discount the utilitarianism which really lay at the root of all. Necessity and pleasure thus walked hand in hand, the former, by its "directfulness," giving the cue to the sturdy formality and strength of purpose which so appeals to us now. The natural result was a happy blending of pleasure and use until, by the simple process of evolution, the original uses were no longer required, and therefore not understood and misapplied, and the way then stood open for the chaos and futility of Capability Brown and his evil school.

Some slight consideration of the original cause of the development of the garden leads us clearly to the fact that the garden was necessary for the home life; that fruit, flowers, walks, turf bowling-grounds, shelter and seclusion were the natural outcome of the household requirements, and so house and garden became wedded, as it were, into one, each dependent on the other, with logical purpose governing both. Each thus gaining from the close and living contact with the other, they finally became that perfect whole, which we can doubtless conjure up before our eyes. The grey stone or purple



A Trellis Pergola.

brick weather-beaten house, the trim well-kept walks, the velvet turf, the checkered play of light and shade on grass, yew, and gravel. The quaint old-world flowers, coming and going again and again, year after year, in their old familiar places beside the stained and lichened wall, with its kindly shelter from the northern winds. The sundial with its happy phrase, perhaps some little sunken garden, secluded and more sacred than the rest, with the flash of its cool fountain. Last, but by no means least, the generous fruit garden and orchard, delighting equally in sight and taste. But no words of mine can adequately describe the limitless possibilities which are to be found. The result we know, that happy blending of house and garden, which is the outcome, not merely of chance and time, but of steadfast purpose and well-trained organised design, born in the days when gardening was a loving craft worthy to be followed, loved, and understood by the noblest minds.

In effect, then, these three—seclusion, usefulness, and pleasure, are what I conceive to be the principles underlying the old tradition and examples.

The question we must next ask ourselves is this—Do these principles still hold good; are the same necessities still in existence; can we after making all due allowance for the lapse of centuries and rapid growth of modern requirements, still say that the same factors should form the basis of good garden design in this twentieth century, and, if so, how is the architect thereby affected? At first sight it may appear that as the old order changeth, giving place to new, so we must search for new essentials upon which to found the lines of a logically designed modern garden; but a little consideration will, I think, show that in reality almost all the old conditions should apply at the present time.

First, *seclusion*. I should say that in these days of publicity, of interviewers, photographers, cheap magazines, and general social scramble, never was the quiet calm of the garden more desirable. The greater number of houses, and the greater chances of being overlooked by near neighbours, serve to make strongly defined boundaries, which will act as screens, even more imperative than ever, and thus we have ample excuse for "high-walled gardens green and old," hedges thick and trim, and well designed trellis as bounding lines.

Of the usefulness and necessity of a garden the need is still the same, though perhaps at first sight not so apparent, and the reasons are more psychological than materialistic.

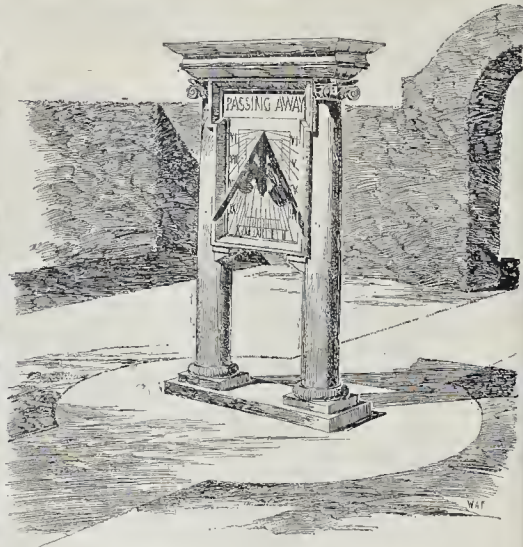
Different kinds of fruit and vegetables can probably be bought from the greengrocer as cheaply as they can be produced in most private gardens, certainly near London, but the demand for them is greater than ever. Jam and pickle factories have done away with the absolute necessity for home growing, but I think every one will agree that home-made jams are far superior. I am sure that few people realise how much can be done and how much pleasure obtained from even a limited number of well-cared-for fruit trees, and what is more beautiful than an apple or pear orchard either in early summer or autumn? Then, too, there are many trees such as mulberry, quince, medlar, cherry, plum, filbert, which are full of delight to the eye, and useful as well, which planted with discernment will give pleasure to generations. Although sociology hardly comes within the scope of this paper, and without going quite as far as Voltaire's "Candide" and saying "Let us cultivate our garden, for that comprises the whole duty of man," I am certain that if nowadays, gardening, not merely flower gardening but honest fruit and vegetable growing with the accompanying culinary knowledge, was better understood and followed, as our forefathers followed it, the modern cry of broken nerves and jaded energies would not be so much in evidence, both for men and women—and the everlasting cry for amusement and excitement might somewhat abate. There is no recreation more healthful than gardening, and health is the ground plan of all that is worth having in life.

There is one other point I must touch upon in connexion with the necessity of the garden, and that is its educational influence, especially upon children. In these days, when so many time-honoured fallacies have had to succumb to modern science, there is no better way of teaching scientific truths and imparting a true system of observation of nature than by means of the well-ordered garden—of the joy of the "pleasure garden" there can be no doubt. Bowling greens have given place to tennis and croquet lawns, but that is only in the course of the natural evolution of physical recreation, which has become more imperative and vigorous. The love and desire for sweet-smelling, beautiful flowers and dry walks—indeed, all the pleasing fancies of the old gardens are strong as ever, and, surely, we moderns of the twentieth century, with all our increased knowledge and vaunted cultivation, should be able to appreciate the pleasure part of the garden, and derive moral and physical good from it as much as our ancestors. Without wearying you further then, it is my

belief, that after making allowance for the gradual evolution of certain old forms, such as bowling greens, to modern ones, such as tennis lawns, speaking broadly, all the old essentials are still in existence. If some are in modified forms, and if some have dropped out, others have made their appearance, and, therefore, the same factors or their modified or more highly specialised descendants still govern garden design. The house and garden still require each other to make the home one perfect whole. Each must fit in with the other, and each must be in most cases subject to some special circumstance of site and locality.

Who, then, is so fitted to bring this about as the man who designs the house? He it is who must have a hand in the laying out of the garden, or, as I hope to show, points may be missed, and full advantage of the site may be lost, and so the chance of welding together house and garden through some happy accident of nature may be missed for ever. How, then, can we convince our clients that one mind should control the two? The end can only be achieved by taking our client (or more often his wife) with us. He probably has no conception that we look upon the garden as our province, and care must be exercised in approaching the subject. If he is a careful man, or anxious of expense, it may be well to approach the garden from the materialistic point of view. Point out the desirability of determining where surplus earth may be removed at one hauling, and thus save labour, and form your broad lines all in once. The making of paths from old material may be suggested, or the position of the carriage drive if the house is to have one. If by some such means the ice can be broken and the rude shock got over of finding that the architect wants to have some hand in the external surroundings of the house, then, perhaps, the rest may be plain sailing, and if the man or woman has any real love of the garden, out it will come, and the resulting garden should express not so much your individuality as in the house, but the owner's, directed by a trained mind, but still expressing, and that, too, decidedly, the owner's particular quips and cranks.

If, however, he is still untouched by the revival, and is a "wobbly-walk" man, then indeed our labours are hard, but it is well to remember that mostly these men are such from want of knowing better, and a little tact and an *apparently* unstudied introduction to "The Formal Garden in England," may work wonders, and all may be well in the end.



A Sundial.

Most people are open to argument, and the arguments in favour of formal lines and well-defined boundaries are so well known that no more than a passing reference is needed here. Moreover, the back of the old opposition is broken, and the architect will chiefly have to make good his claim to the right to settle the main lines of the garden scheme.

Before, however, he can scheme anything there are certain facts he must know. First of all comes the question of garden labour. He must ascertain exactly what amount of labour will be kept, for upon this hangs in reality the whole scheme. It is suicidal to design a garden which requires the time of four men to keep it in proper order if only two are to be kept, and the evil has two results. First, your garden will never look well, it will be untidy; and secondly, the owner will never feel satisfied, and will either be compelled to employ more labour than he can well afford, or else put up with the evil of an understated garden. In either case he will blame the designer, who assumed a responsibility without due knowledge.

The chief charm of a real garden is, I think, shown in the care which is taken of it. If the turf verges are shaggy and ill-kept the charm of line is gone, and the feeling of love and care which should be induced will be wanting. I know a garden, and I say garden advisedly, which is only some 16 ft. by 20 ft., and yet year in and year out it is the pride of a village, and that solely by reason of the love and care bestowed on it by its cottage owner. I know also gardens which are gardens in name only, because they are too ambitious for the staff, and therefore paths become weedy and turf gets dull for want of sufficient attention. These may sound great platitudes, and be well known, but it is so easy to draw on plans gravel walks, grass borders, and sunken lawns, forgetting all the while that walks want constant attention, and that grass borders and slopes especially require plenty of labour in summer if their true value is to be obtained. Grass particularly only looks its best when it is necessarily rolled and mown, and rolling and mowing, I know from practical experience, take time, even for a small quantity. Therefore, above all else, first find out how much

labour will be kept, and cut your garden accordingly. Some excellent practical advice on the subject of garden labour is given in Mr. Mawson's "Art and Craft of Garden Making," but the best way of arriving at a reasonable judgment is to carry in our minds some garden or gardens we know well and the number of men who are employed, comparing the results obtained with the size of the garden and using our knowledge when designing.

Having discussed preliminaries and discovered the trend of our client's garden mind—if, fortunately, he has one—the choice of the actual position and aspect of the house will largely depend upon the result arrived at, especially, perhaps, if the site is a hilly one. For instance, we might choose a level site for a lawn to avoid expense in moving earth, and the position thus chosen might affect the house considerably, for often it is far better to take old meadow turf in hand, to work, roll, and mow it, in fact, rather than to sow afresh, especially where time is an object and where a newly turfed or sown lawn would be a considerable drawback to the early enjoyment of the garden. For turving and sowing can only be done at certain seasons, viz., spring and autumn, and then the result depends largely upon weather, which is chance. Nothing so makes or mars the appearance of a garden as good or bad turf.

A fall in the ground or an old hedgerow may be utilised for a terrace, but it is not necessary to enumerate all the possibilities. Generally some characteristic of the country side or natural feature on the site which may lend itself to our gain can be seized upon, and which may influence or modify both house and garden, proving how essential it is that the architect should have the necessary knowledge to turn the accidental peculiarities of the site to the best advantage. If he merely settles the aspect and plants the house down upon the site without thought of the garden, it seems to me obvious that chances will again and again be missed of making some special point or feature which will stamp the future home with an individuality all its own.

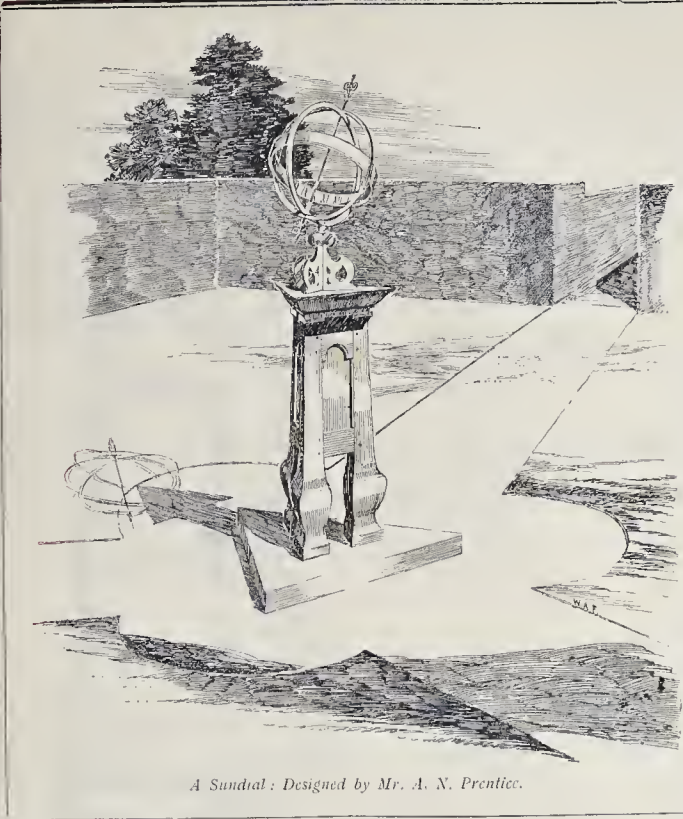
Surely, then, each site must be treated on its own merits before the house is built, and it needs no imagination to see that to do this properly

house and garden must be considered together and at the same time.

It must not be forgotten that in almost all gardens there is a chance and opportunity—indeed, a necessity—for some architectural features which it is essential the architect should design or control. It is here that the modern garden designer and horticulturist necessarily fails. He has not had, in most cases, the requisite architectural training, and not having designed the house, he perforce loses that sympathetic link in detail which the architect would impart, and thereby still further blend in harmony house and garden. The old gardens were full of architecture, and such buildings as tool-houses, pottingsheds, root-houses, stone steps and balustrades, summer-houses, clovecoats, seats, and thoughtful trellis work—features in them—are required still, and if used with restraint will help to add human interest. But here again the necessity for them should be the keynote. Do not let us introduce them simply to make "features." If a seat is desired it will work its way into the design, and by its presence add to the garden's beauty. The sundial, though apparently no longer a necessity in these Grimthorpean days, is most fascinating, and if used rightly will set our thoughts working and lend just that touch of romance which is needful to both eye and memory. Above all, let us keep garden architecture simple both in form and feeling. It is not what we put in so much as what is left out that sets the seal on the perfect garden, and this is a point I particularly want to emphasise. The old formal garden had almost degenerated into grotesqueness by the eighteenth century from over-elaboration. Bacon's advice, "Be not too busy or full of worke," had been forgotten. Let us keep this and Sedding's maxim, "All is fine that is fit" well in mind, and see that we fall not into the like mistake.

Thus far I have dwelt only with the main principles upon which I conceive garden design was founded in the past, their application to modern conditions, and some reasons why the architect should be a garden designer. The architect's knowledge, however, must extend further than this. He must have a knowledge of garden craft. He must know and love the materials he has to design with—namely, the flowers, grass, trees, and herbs. He must have an eye to the fall and lie of land, and the differences of soil and aspect, and be fully alive to the fact that a garden is a living, growing thing, pulsating with life, and not the outcome of a geometric paper design made by a man who knows naught of his materials.

So much has been said lately about gardens from the practical point of view (and I would especially call to your attention a paper by



A Sundial: Designed by Mr. A. N. Prentice.

Mr. Mawson, read before the Birmingham Association, which appeared in the *Builder* for January 19 (this year) that I know I could only cover the same ground, and in a far less able manner; but some points may be mentioned as being typical and also as essential for us to know. I will mention them briefly, only saying that experience and constant inquiry whenever opportunities occur are the best means of gaining that practical knowledge which it is absolutely necessary for us to have if we are to cope successfully with garden design.

First, then, soils and drainage. Obviously the latter depends upon the former, and until considerable practice has given us knowledge I would suggest that we first of all ascertain what is the local custom as to treating the soil, and how much or how little drainage is required. Mr. Mawson says that "unprepared soil is the cause of almost all garden failures."

Secondly, we must discover what grows well in the neighbourhood, for it is no use designing and planting trees or boundaries which will not grow successfully in the locality, necessitating planting being done again after some years and at a time when some considerable show and growth should have been the result of our efforts.

Thirdly, botanical or horticultural knowledge. I do not think it at all necessary for us to go very deeply into this question, but what we must do is to know something of the times and seasons at which the flowers we propose to use will make their richest appearance. We need not know the best way to make them grow, but may presume that will be done for us. Observation and a garden notebook will teach us much.

Good, well-made, dry paths and walks are a practical necessity, for wheeling soon cures them up unless the foundations have been well prepared. Fruit and flower gardens must have sun and must have shelter, or plants will not grow, and early and late frosts will do a vast deal of unnecessary damage.

The house-drainage scheme must not be overlooked, and advantage should be taken of all manorial products.

In effect, then, the burden of my paper is this: House and garden must not be severed,

but must be treated together, and be the product of one mind—the architect's. He may scheme his garden as he pleases so long as it is subordinated to the house, and he always keeps before him its fundamental uses and objects—seclusion, usefulness, and pleasure.

Thus I have endeavoured to link architect and garden together, and the knowledge he will have to make his own will be the most satisfying and delightful of all his education. If in building materials we are brought in contact with Nature that is dead and gone, in the garden we are face to face with living Nature herself, and the more we know of her, the more we shall love her "myriad ways."

I have now but to ask you to "piece out the imperfections with your thoughts," and to make yours the ideal I have tried to keep before my own eyes—

"A garden bower'd close
With plaited alleys of the trailing rose,
Long alleys falling down to twilight grots,
Or opening upon level plots
Of crowned lilies, standing near
Purple-spiked lavender:
Whither in after life retired
From brawling storms,
From weary wind,
With youthful fancy re-inspired,
We may hold converse with all forms
Of the many-sided mind,
And those whom passion hath not blinded,
Subtle-thoughted, myriad-minded."

RE-OPENING OF TACKET-STREET CONGREGATIONAL CHAPEL, IPSWICH.—Tacket-street Congregational Chapel, Ipswich, was opened on the 21st ult. after undergoing extensive alterations and additions. The end galleries from the pulpits have been removed, with the vestries which were underneath them, the side galleries having been carried up to the end wall. The organ has been reconstructed and refixed on the ground floor. The east window has been raised and filled with stained glass. The additions consist of a church parlour, deacons' and ministers' vestries, lavatories, and a kitchen. The church parlour, which has been named the Langston Hall, is 35 ft. 6 in. by 23 ft. and has a recessed platform 14 ft. by 5 ft. The architects for the alterations were Messrs. Eade & Johns, Ipswich. Mr. Fred. Bennett was the contractor.

THE ARCHITECTURAL ASSOCIATION
SPRING VISITS.

ON Saturday, March 30, a visit was paid to the Prudential Assurance Company's new offices in Holborn. Last session the Association were much interested when this immense addition to the old building was in the earlier period of its construction, and this second visit was all the more instructive, as it is now possible to see the more fully-developed scheme, and in a measure to gauge the working of the new building with the old.

The whole of the block is to be used entirely by the company for their own offices, and in many respects the thought and consideration given to the employees is a remarkable evidence of what can be done by skilful planning.

The general character of the work has been previously dealt with in these columns. The excellence of the materials used and the quality of the workmanship leave nothing to be desired.

The central tower is the principal feature of the Holborn front, and will give an added effect to the now familiar lines of the present offices.

Mr. Paul Waterhouse, in conducting the visitors round, made some interesting remarks with regard to certain processes in connexion with the Falence work. It may be of interest to note that during the excavations some beautifully iridescent glass sack bottles and flacons were found, dating back to the fifteenth or sixteenth century.

Illustrations.

NORWICH UNION LIFE INSURANCE
NEW HEAD OFFICES.

THE directors of the Norwich Union Life Office recently invited a few architects in London, Norwich, and elsewhere to send in plans for new head office buildings which they proposed to build in Surrey-street, Norwich. The design which they selected, and which is to be carried out, was submitted by Messrs. Geo. J. Skipper and F. W. Skipper, architects, of Norwich.

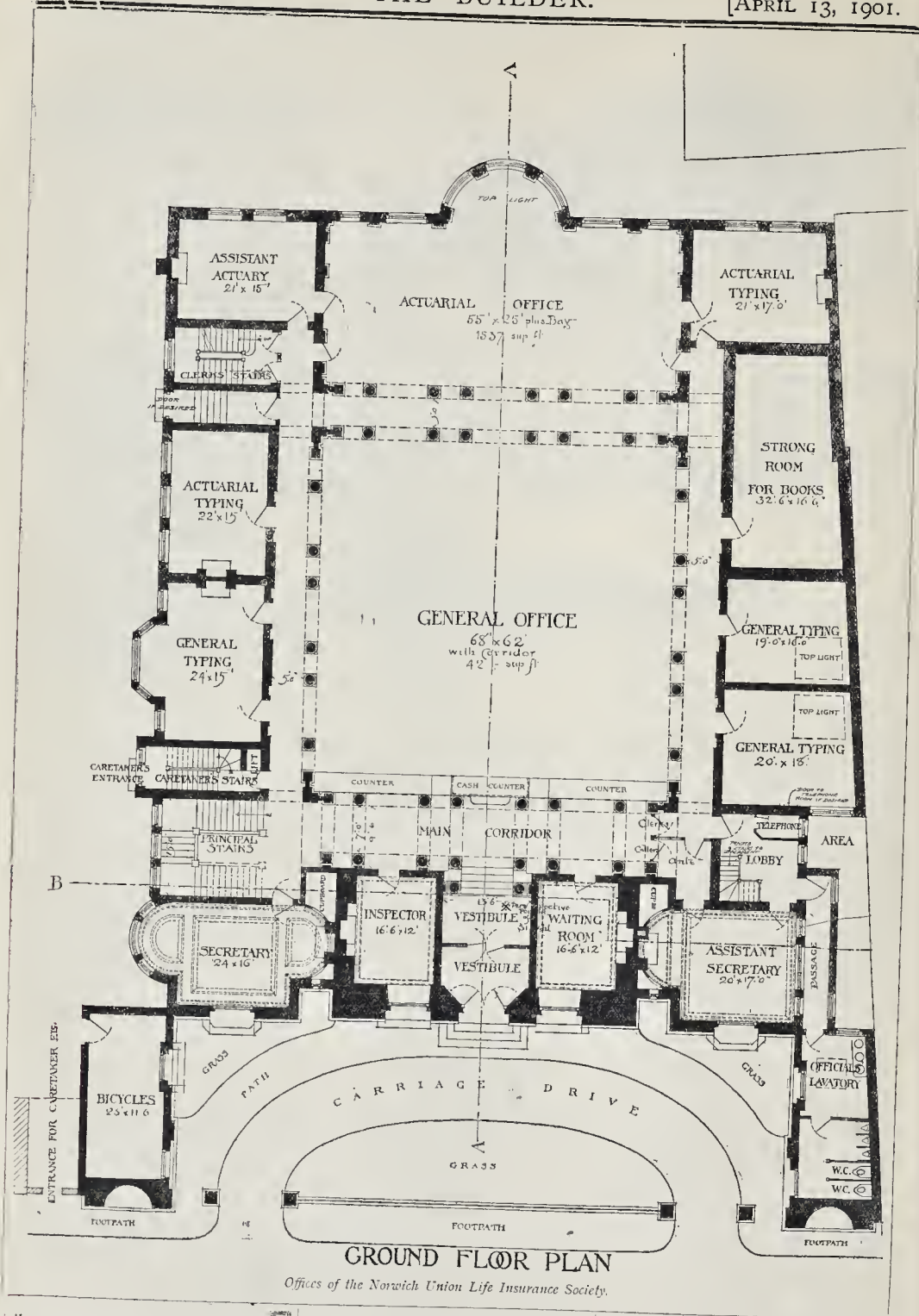
The instructions issued to the competing architects were clearly and concisely drawn up, and the conditions were framed in a very proper spirit; no limit to cost was imposed (though cost was to be a consideration), the building was to have but little carved enrichment, and all plans and drawings submitted were to be strictly uncoloured.

The requirements included a large general office or hall on the ground floor, as well as the other necessary smaller offices. In the design we illustrate this general office has been made the chief feature of interest inside the building, the other offices and rooms being placed round it. The plan explains how this idea has been expressed. The necessity for providing ready facility for getting from the central hall to the other rooms grouped round it suggested the open colonnade on the ground floor. On the upper floor many of the rooms are to be used by the directors, and consequently greater privacy was needed for the corridor surrounding the large hall; this was carefully considered in contriving this floor, and the corridor, although sufficiently retired, has yet been kept as an integral and visible part of the large hall. The solicitor's department occupies two sides of the upper plan, and the staircase arranged in the centre of this group of offices connects this department as closely as possible with the actuarial offices below, and at the same time provides direct and easy access for the clerks to their luncheon-room, which is situated immediately below in the basement.

The boardroom and committee-rooms on the first floor are set back from the street to avoid nuisance from street noises, dust, &c., and to the boardroom top lighting has been provided so that the room can be perfectly lighted even if the windows to the street are entirely closed or shaded.

The impossibility of placing windows on the boundary of the site on the right-hand side has necessitated top lighting in some cases, but this method has been used as sparingly as possible, and only to some of the lesser offices and where its use could be turned to architectural advantage.

The caretaker's kitchen (on the second floor)



is large enough to provide cold luncheons for the staff luncheon-room in the basement, with which it communicates directly by a lift next to the caretaker's stairs; the luncheons for the directors are otherwise provided for. The strong-rooms (with directors' examining-room adjoining) in the basement are entirely

separated from other parts of that floor, and have a special staircase leading to them from the ground floor.

The general character of the elevation was considered with a view to giving a dignified "head office," and one that would harmonise with its surroundings in Surrey-street. The

whole of the exterior shown in the view is proposed to be built in Portland stone.

The figures in the niches on either side of the main façade are designed to maintain the historic associations of the present Life Office, that to the left hand bearing the date 1706, when the Amicable Life Office, which is incor-

porated with the present office, was founded, and that on the right hand, in the dress of George III.'s time, bearing the date of the founding of the Norwich Union Office, 1808.

It is proposed to construct the building throughout, from basement to roof, of fireproof materials. The ventilation and warming will be arranged on modern principles.

THE GUILDHALL, EXETER.

The well-known ancient Guildhall of Exeter is situated in the High-street, a main thoroughfare of one of the three oldest and most historical cities in England. The High-street is very picturesque, containing many quaint timber fronts standing side by side with modern buildings, chiefly occupied as shops and offices. The most conspicuous building is the "Old Guildhall," with its Renaissance front, which is one of the most striking examples of a Town Hall that exist in this country. The hall itself is a very ancient building, with an open timber roof and a panelled wainscot dado about 9 ft. high, and was formerly a chapel dedicated to St. George and St. John the Baptist, and rebuilt in 1466. On its walls are numerous coats of arms of mayors, recorders, and benefactors, and numerous portraits, including one of George II., by Hudson; also the Princess Henrietta Maria and General Monk, by Sir Peter Lely. The cap of maintenance and the State sword, which was presented to the Corporation by Henry VII., and another sword presented by Edward IV., are among the civic treasures kept at the Guildhall.

In 1588 the present Beer stone front was added, consisting of an arcade of three arches carried on massive granite columns with caps and bases all in one piece. Above the arches is a frieze of raised panels and a cornice, then another series of panels. On the return elevations the city crest occurs, which at one time was picked out in red, yellow, and blue. Between the first-floor windows, standing on massive corbels, are pairs of Corinthian columns, with rudely-carved caps, supporting an entablature with a modern wooden balustrade above.

Until about forty years ago the front was periodically cleaned down and coloured cream colour, the frieze, flutes to columns, and sinkings being picked out in red, the columns being gilded, as traces of gold were visible before the recent restorations were made.

Not until the ancient building had been thoroughly opened out by the removal of the flooring and panelling around the walls of the Council Chamber and the flooring of the room above was it fully realised how dangerous the whole structure had become; indeed, it was then a matter for general surprise that the building could stand in such a serious condition, for the once massive beams of oak upon which the main part of the projecting portico was originally built had become so decayed that only dust remained. Fortunately this part of the edifice had been externally supported with centering and strutting in a very careful manner, under the direction of Mr. William Weir, the supervising architect representing the S.P.A.B.

In place of these beams lintels of tile set in cement were inserted, built slightly on the camber, and the internal masonry above carefully drawn out in sections and rebuilt. To brace the building iron tie rods have been placed both straight and diagonally at the floor level. The 18-in. square oak beams of the floor of the upper room were found, through decay, to have lost their bearing on the front wall, and they were, therefore, without any support except at their other ends, some 30 ft. northwards. To pick these up a truss was formed of teak to fill the entire gables of the front with a bearing on the main east and west walls. The beams beneath the main flat were also decayed, and have been replaced with many tons of English oak and securely tied back to the main building. Teak stanchions have been introduced from floor to floor in order to stay further movement of the front, gun-metal straps being placed around the piers of masonry between the windows and bolted back to them. The two main roofs, the bell turret and its roof, have all been reconstructed, the principals strengthened and left where found sufficiently sound, the remainder renewed in English oak.

The rotten slating to roofs, held together with tar and sand, has been replaced with rough thick slates from the Delabole quarries. All

the old lead has been recast in sheets of 8 lb. to the foot, and relaid on main flat, gutters, ridges, and flashings, and the flats protected with snowboards. The chimney is rebuilt in Thorverton stone, and the fronts of trussed gables and bell turret are covered with rough cast. A new oak floor of double thickness has been laid in the Council Chamber (now used as the Mayor's parlour), and the walls panelled in oak. The ancient fireplace in this room was exposed when the modern mantel was removed, the massive jambs of Thorverton stone being found in a good state of preservation; the lintels and hearth were renewed in the same stone. The interesting bit of fresco which adorned the wall around the fireplace has been carefully preserved. The old glass of the five-front transomed windows has been re-leaded and refixed. The preservation of the exterior stonework of the Beer stone front has been effected in a very conservative manner, and only where structurally necessary has new stone from the Portland quarry been inserted. All the loose jointing throughout has been thoroughly grouted, and loose portions of stonework rebuilt. The top beds of the projecting string courses have also been protected with lead flashings, the whole surface being finally treated with a preservative.

The basement beneath the pavement level was also taken in hand; the beams and joints supporting the stone flagging were in a very decayed condition, and have been replaced with brick arches and the flagging relaid. The whole of the work has been carried out by Mr. Herbert Read, of Exeter.

JAMES H. SHEARER.

VARIOUS EXAMPLES OF APPLIED DESIGN.

These examples of design applied to objects of practical use were all photographed from the collection of work in Mr. Montague Fordham's showroom in Maddox-street.

Fig. 1 shows a silver tea-pot, hot-water and cream jugs, designed by Mr. Arthur S. Dixon, and executed at the Birmingham Guild of Handicraft. These pieces of silver are hammered work, and the hammer marks not being polished off, a surface full of character remains.

Fig. 2 is a jewel-case, in gesso, designed by Mr. J. Paul Cooper. The raised figures, which are white, symbolise these various jewels; the rest of the outside of the box is a rich blue. The gold key is a fine piece of work.

Fig. 3 is a fire screen, in ironwork, designed by Mr. Percy S. Worthington, architect, and executed under his direction. The framework, of hammered iron, is finished half black. The lattice is made with threefold iron wire.

Fig. 4 is a kettle, of the same set as the three pieces of silver (fig. 1).

Fig. 5 is a brass electrolier, from the workshops of the Birmingham Guild of Handicraft.

Fig. 6 shows some china vases and candlesticks, by the Misses Lucas. This china is made under the direction of the Misses Lucas, and hand-painted by them.

INTERNATIONAL BUILDING TRADES' EXHIBITION.

The following is a list of fixtures to be held during the time the Exhibition remains open, from April 17 to 27:—

Friday, April 19.—Visit of Institute of Builders.

Saturday.—Visit of Architectural Association.

Wednesday, 24th.—Visit of Institute of Sanitary Engineers.

Thursday, 25th.—Annual meeting and dinner of Institute of Clayworkers.

Friday, 26th, 4 o'clock.—Conference on standardising of bricks.

In respect to the standardising of bricks, this Conference has been arranged jointly by the Royal Institute of British Architects, the Institution of Civil Engineers, and the Institute of Clayworkers. The chair will be taken by Mr. Thos. Blashill, F.R.I.B.A. Any one desirous of attending this meeting may obtain admission to the Hall upon application to 43, Essex-street, W.C. A party of Germans, numbering fifty, engaged in the building industries, will pay a ten days visit to England for the purpose of seeing the Exhibition. They will be entertained at a banquet in the hall by the Institute of Clayworkers, on the evening of Thursday, the 25th inst.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, April 2, Mr. James Mansergh, President, in the chair, the paper read was "The Burrator Works for the Water Supply of Plymouth," by Mr. Edward Sandeman, M.Inst.C.E.

He said the waterworks of Plymouth dated from 1590, in which year Sir Francis Drake, under powers conferred by an Act of Parliament of 1585, had commenced to build a weir to the river Mew or Meavy, and to excavate an open watercourse or leat from the weir to Plymouth, a distance of 10½ miles in a direct line, but 18½ miles along the route taken. The drainage area above the weir was 4,885 acres. The work had been completed, and water had been brought into the town in April, 1591. Water taken from the river by this means had supplied the town for 300 years. The open watercourse, however, was liable to be blocked in times of snow and frost, and for this reason, and also because the increased population demanded a larger and more certain supply, various schemes had been promulgated for the storage of flood-waters and the protection of the leat. In 1891 the author had been appointed Water Engineer, and a few months later he had presented a report, which had been adopted, advocating the building of a storage-reservoir and the substitution of a line of pipes for the open leat. An Act of Parliament had been obtained in 1893 for the construction of the necessary works, which had been commenced in August of that year, Mr. James Mansergh, President Inst.C.E., acting as consulting engineer.

By the new scheme the drainage area had been increased from 4,885 acres to 5,360 acres. Nearly the whole watershed lay on the granite formation, a small portion on the west side being on the Upper Devonian. The rainfall was about 58 in. or 60 in. annually, and an interesting feature of this gathering ground was the unusually high dry-weather flow from it. The Burrator reservoir was formed by two dams, one of masonry across the narrow gorge through which the river Meavy flowed, the other of earthwork lying between two hills, Sheepstor and Burrator. The greatest depth of water was 77 ft., and the area covered by water was 117 acres, the quantity of water impounded being 657,000,000 gallons. The masonry dam (called the Burrator dam) was built of large rough blocks of granite in cement in the interior, and faced with irregularly coursed granite on both sides. From the bottom of the foundation to the coping of parapet wall the height was 145 ft. 6 in. A roadway, 18 ft. wide, was carried over this dam on five segmental arches of 25 ft. span. The earthen dam was remarkable for the fact that its construction had involved the cutting of a very deep trench for the foundations, although the dam had to withstand but a small head of water. The trench had been cut through decomposed granite to a depth of 105 ft. in the centre, although the depth of water against the dam was only 17 ft. This trench was interesting on account of the peculiar geological features met with. The watertight core of the dam was of concrete (5 ft. in thickness) up to within a few feet of ground level, and of clay from that point upwards.

Water was drawn from the reservoir through two pipes, 36 in. and 25 in. in diameter respectively, laid in a 10-ft. culvert built in the masonry dam. There was no valve-tower. There was a specially designed valve to close the mouth of each outlet-pipe, worked by gun-metal rods and chains from a chamber at the top of the dam, in addition to sluice-valves in duplicate in a valve-chamber on the lower side of the dam. The water drawn for consumption was passed through screen-chambers before entering the pipe leading to the service-reservoirs. The flood-water running to waste was measured over a weir 50 ft. wide, the height of the water over the weir being recorded on a drum turned by clockwork. The compensation water was measured by an orifice gauge placed immediately below the weir. The water supplied to the town was measured over a gauge-weir 12 ft. wide, after which it passed through a 25-in. Venturi meter, which automatically recorded the flow on a diagram.

The pipe-line, which had been laid in lieu of the old leat, was 4½ miles long. The pipes were 25 in. in diameter, and were capable of delivering between 8 million and 11 million gallons per day. The pipe-line had been com-

pleted in May, 1894, and the reservoir and other works in June, 1899, at a total cost of 178,000*l.*

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting of this Institute was held on the 3rd inst., Judge Baylis, K.C., in the chair. Mr. O. M. Dalton read a paper on the "Foudri d'Oro, or Gilded Glasses of the Catacombs." He gave a brief summary of the present state of our knowledge on the subject, classifying existing specimens according to their subjects and presumable dates. It was probable that these glasses first became common in the third century, and that they continued to be made until an advanced period of the fifth, or even later. The process by which they were produced had an important influence in suggesting the use of glass mosaic, the cubes of which were made in a similar manner with a protecting layer or film of glass over their surfaces. The idea of glass vessels ornamented with etched designs in gold leaf between two layers, probably originated in Egypt, but at what date was not certain. An allusion of Athenæus to *ἀδάνα διάχροσα* belonging to Ptolemy Philadelphus seemed to refer to something of the kind, but the first certain evidence was supplied by specimens dating from about the beginning of the Roman Empire found in Egypt, Cyprus, and Canosa (Athenium). The process was said to have been continued in the Eastern Empire, and in the West was alluded to by the early mediæval writers Heraclius and Theophilus. Panels for caskets and triptychs of the same workmanship were executed by Cennius Cennini of Padua at the close of the fourteenth century. After the revival of interest in the Catacombs in the sixteenth century, various efforts were made to reproduce the ancient processes, and these continued with varying degrees of success down to our own time when Salviali had produced examples in something approaching the old style. By the kind permission of the director of the Victoria and Albert Museum several pieces of Italian work of the fourteenth century were shown, and a fine modern Venetian reproduction was kindly lent for exhibition by Mr. C. H. Read, F.S.A.—Mr. W. H. St. John Hope read a paper on the Gilbertine Priory of Watton, in the East Riding of Yorkshire, exhibiting a coloured and dated plan of all the remains of buildings as yet found on the site. The Gilbertine Order is one of special interest for two reasons: that it was the only monastic order of English origin, and that its houses were normally dual, having both nuns and canons. In some of the twenty-six houses of the order, the dual principle seems to have lapsed; but at any rate it remained in force in nine houses at the suppression. Watton was one of these, and the largest of the order. The site of the Priory is free from buildings, and the excavations have, therefore, resulted in the discovery of almost the entire plan of the house, with the exception of the infirmaries, of which nothing is as yet known. The nuns were the more important element in the Gilbertine house, and accordingly the buildings devoted to their use at Watton are the more extensive. They consist of the church, cloister, parlour, chapter-house, warming-house with dorter over, frater, kitchen, and a western range, including a guest-house. The church was a building 206 ft. long, with presbytery, central tower, north transept, with chapels and nave for the use of the nuns, and a large south aisle with south transept and chapels cut off from the rest of the church by a solid wall, which belonged to the canons. In the dividing wall was a turn through which the nuns might receive the communion and the pax, so arranged that a view of either portion of the church from the other was impossible. The canons' buildings are to the east of the nuns' court, and are joined to it by a long corridor in which was probably the window-house, where the nuns communicated with the officers who managed the affairs of the house. This second group of buildings consists of a cloister with the usual offices, and a church on the south side. Remains of a very fine fourteenth-century lavatory exists in the north walk of the cloister. The fifteenth-century prior's house, west of the church, remains for the most part complete, and is still inhabited. The buildings date from 1170—the larger church being of this date, with fragments of a somewhat earlier building destroyed in the

fire of 1167—down to 1500, the canons' buildings being chiefly of about 1320, and the nuns' eastern and northern range of the thirteenth century. Chalk was largely used in the construction, and consequently the ruins have been much destroyed by lime-burners. There are many traces about the site of the moats and earthworks prescribed by the Gilbertine statutes for the better seclusion of the members of the house.—Miss Rose Graham contributed some remarks on the history of Watton Priory from documentary evidence collected by herself. In 1330 the house was heavily in debt, the prior owing 70*l.* to the Archbishop of York. This debt was probably for the building of the canons' cloister. *Conversi* seemed to have ceased at an early date, all outside work being done by paid servants at the end of the thirteenth century. The house suffered considerably in the early fourteenth century from robberies, partly by the de Moleys, who seem to have had a quarrel with the prior, and partly through the royal purveyors of Edward II. on his expedition to Scotland. But in spite of this the general state was prosperous, and in 1326 no less than fifty-three nuns took the veil. The statute as to the kitchen, providing that all should be served from one kitchen only, was certainly evaded in the fourteenth century, if not earlier, despite Papal bulls to the contrary effect. In the very last years of its existence the Priory was drawn, much against its will, into assisting the rebels of the Pilgrimage of Grace, through the efforts of Holgate, who held the house *in commendam*, and seems to have stolen and squandered their resources shamelessly. Mr. Emanuel Green also took part in the discussion.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—An ordinary meeting of this Association was held on the 3rd inst., Dr. Winstone in the chair. Mrs. Collier exhibited an ancient religious picture of Byzantine art, painted on panel and enclosed in an ornamental silver frame about 6 in. square, with a curious filling of silver embroidery concealing the picture excepting the heads and hands of the figures. It was an "icon" and was brought from Moscow. She also exhibited a small "shrine" of bronze, inlaid with mother-of-pearl, presenting the singular feature of one foot of the Crucified being much larger than the other foot. This also came from Moscow. Mr. Patrick, Hon. Secretary, read a lengthy paper by Miss Russell upon "The Structure and Probable History of Some Rude Stone Forts in Scotland," the forts more particularly dealt with being those of Craig Phadric, near Inverness, and Castle Finlay, between Inverness and Nairn. Craig Phadric is a fort of loose stones bearing no visible traces of vitrification, although it is probable that a real vitrified wall exists beneath the stones, forming a backbone, or core, to keep the larger rampart of loose stones in place. Castle Finlay is a much smaller fort standing on a bridge-path through the woods, which is locally said to be the old road to Perth. It is quite small, with, in proportion, a large, loose stone rampart all round, in which the natives seem to find burnt stones. There is strong probability that Craig Phadric is really the castle on Loch Ness where St. Columba visited the king of the Picts.

BOOKS RECEIVED.

TRANSACTIONS OF THE EAST RIDING ANTIQUARIAN SOCIETY for the year ending September, 1900. Vol. viii. (A. Brown & Sons, Limited, The Savile Press, Hull.)

LONDON COUNTY COUNCIL SURVEY OF MEMORIALS OF GREATER LONDON—BROMLEY-BY-BOW. VOLUME I. OF THE REGISTER OF THE COMMITTEE FOR THE SURVEY. (P. S. King & Son.)

BAPTIST ASSOCIATION CHURCH AND SCHOOLS, MUSWELL HILL.—The seating accommodation of this church is about 900 persons. The ceiling is vaulted in woodwork. A hold tower terminated with a spirelet forms a prominent feature in front; the buildings are faced with red brick, with Bath stone and Costessey dressings, and the style is Late Decorated Gothic. Messrs. Mattock Brothers' (Wood Green, N.) tender of 6,498*l.* 16*s.* has been accepted for the work; the architect's estimate was 6,780*l.* The design for the building was selected in a recent competition limited to six architects, the alternative designs by the same authors, "Greek Cross" and "Twentieth Century," being placed respectively first and second. The architects of the selected design, "Greek Cross," are Messrs. George Baines and Reginald Baines, of London.

Correspondence.

To the Editor of THE BUILDER.

THE PRESENT CONDITION OF THE BUILDING INDUSTRY.

SIR.—With reference to the prolonged discussion at the Surveyors' Institution on this subject, a few words of extenuation for the much maligned workman may yet be permitted. That the standard of efficiency of the artisan has degenerated is, unfortunately, true, and while, as one speaker suggested, the reduction of manual labour resulting from the use of machinery might have been expected to result in increased mental efficiency and knowledge, this is the very cause of a general deficiency arising from the human tendency to make no greater effort than that called forth by the necessities of the time. While there are individual exceptions, I think this applies very generally to the whole *genus* man. Suppose it were possible to introduce a machine which, by the manipulation of certain stops and the turning of a handle, designs for a building for any particular purpose and in any desired style could be reeled out. Is it likely that the efficiency of the architectural profession would be maintained? Again, if such designs could be placed in another machine, and a mathematically accurate bill of quantities could be produced by revolving the handle, I venture to think that "taking off" would soon become a lost art. There might be a few architects whose love of art, exceeding their love of money, prompted them to adhere to the present method of producing designs, but my opinion, whatever it is worth, is that few surveyors' offices would be without a machine as soon as their efficiency was proved (or possibly architects would invest in "quantity machines" as well, and have other quantities "ground out" by the young lady who operates the typewriter). In any case your architects and surveyors would become mere operators of machines and "piecers together" of the productions of the machines.

And this is exactly what has happened in the building trade; the work which the old time joiner did on the bench by manual labour is now prepared for him by machinery, and he is nothing more than a putter together and fader. And this applies in a less degree to all trades. The artisan has no opportunity of acquiring the skill possessed by former generations, and if he did acquire it, he would have little opportunity of exercising it. That this relaxation of manual labour has not produced a corresponding advance in technical knowledge arises mainly through the conditions brought about by the levelling-down process of trades-unionism, by which there is absence of proper encouragement to a workman to excel above his fellows.

The only remedy for this appears to me to be the establishment of grades. I do not suggest how it is to be done—that requires lengthy consideration; but so long as the veriest muddler and spoiler of material can go and get—I will not say earn—as much as the best skilled mechanic, there is little incentive to advance.

The great question of time, or want of it, generally bears very hardly upon the surveyor, who is accustomed to receive a roll of drawings, with an urgent request for dispatch from the architect, "as I promised the tenders should be in last week." This cannot always be avoided, but the surveyor has a real grievance when an architect supplies him with—in drawings for a new building with a specification of a former job to follow, and then, when the work is all taken off, sends him a set of details and new specification entirely in contravention of the old specification, necessitating a revision of the entire dimensions and descriptions.

HARRY G. ASSITER.

KRAUSS v. MAYOR AND CORPORATION OF BRISTOL.

SIR.—My attention has been called to your report of the proceedings in the Court of Appeal upon the Corporation of Bristol applying to stay an action which I had commenced against them for damages caused by their delay of works comprised in my contract with them for the erection of additions to the Bristol Lunatic Asylum.

Your report may create an impression that I had entered into a contract without any provision for an independent arbitration, but this is not the fact. On the contrary, the contract contained a clause entitling me to demand a hearing before an independent arbitrator in the event of my being dissatisfied with the decision or certificate of the architect upon questions relating to the quality of the materials supplied, or the character of the work done by me, or the price to be paid for any extra work.

The claim made in my action against the Corporation related to matters not contemplated by either party—that is, the damages caused by the delays of the Corporation; and I certainly did not expect that this would be regarded as a matter within the jurisdiction of the architect.

A. KRAUSS.

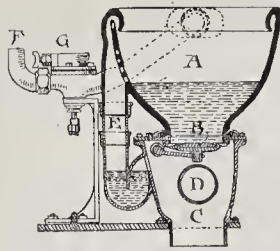


Fig. 1.

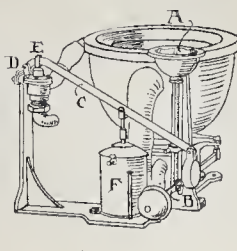


Fig. 2.

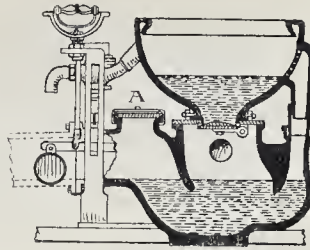


Fig. 3.

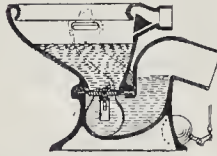


Fig. 4.

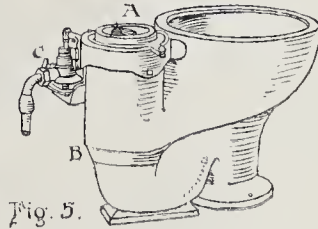


Fig. 5.

Illustrations to Student's Column.

THE LATE MR. F. BOREHAM.

SIR,—In reference to the obituary notice of my father, the late Mr. F. Boreham, architect, which appeared in the *Builder* of March 30 last, seeing that mention was there made in detail as to some of his minor works, I think it is only just to his memory, therefore, to record some of the more important buildings erected by him during his thirty years' practice.

Perhaps he was best known as the architect of many Nonconformist churches in London and the provinces; but other works included the Aged Pilgrims' Asylum, Hornsey Rise, and Old Park, Dover, and, more recently, Temple House, Temple Avenue, the publishing offices of Messrs. Horace Marshall & Son. He was also responsible for several warehouses and business premises in the City, as well as various private residences.

On the list of successful competitions (out of the total entries two-thirds of his designs were premiated) may be mentioned the University College of Wales, Aberystwyth, and the Whitland Tabernacle, London. H. YOLKLAND BOREHAM.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.
13.—WATER-CLOSETS.

MECHANICAL CLOSETS.—For many years after the introduction of water-closets the appliances were of such an insanitary character, and the drains into which they discharged were so badly constructed and ventilated, that they deservedly received a bad name. They were undoubtedly the cause of a vast amount of sickness and a great number of deaths. The one point in their favour was their convenience, and this was so great that in spite of the danger the public insisted on having them. Sanitarians bowed to the public demand and turned their attention to devising improvements in the apparatus and in the soil-pipes and drains connected therewith. Their efforts have been so successful that to-day the principal objection against water-closets is not that they are dangerous to health, but that they involve an enormous loss of valuable manure. Notwithstanding the jeremiad of Sir William Crookes, the public will probably go on running the all-important nitrogen to waste.

It was in 1778 that Joseph Bramah patented his water-closet. This was of the valve type, but as it has long been discarded, no description of it need be given. It was followed by the "pan-closet," which, notwithstanding its terrible defects, has continued in use to our own day. Fortunately it is prohibited by many sanitary authorities, but large numbers are still in existence, and some makers of so-called "sanitary" fittings still continue to supply parts for repairing the apparatus, even if they do not manufacture complete closets. The

pan-closet has three principal parts—(1) the basin, which is usually of porcelain and of hopper form, sometimes with a flushing rim and sometimes with nothing but a fan-spreader for the inlet of the water; (2) the pan, which is a pan-shaped vessel (usually of copper), hinged at one point of the rim, and attached to a lever in such a manner that, when the handle of the lever is raised, the pan swings downwards and discharges its contents into the closed container below, and when the handle is released, the pan returns to its horizontal position, surrounding the lower part of the basin, and receives and retains the last portion of the flushing water; and (3) the container, which is a cast-iron chamber, large enough to admit of the free movement of the pan; as a rule, a lead D-trap was fixed under the container. Not a single important part of the apparatus is without one or more serious defects. The basin is of bad shape, easily fouled, insufficiently flushed, and with too small an area of standing water. The pan is quickly corroded, and therefore ceases to hold water. The container exposes a large area to the action of the "soil," and is soon coated with filth, as it cannot possibly be cleaned by the small amount of water used in flushing. And the D-trap also retains filth, and is in consequence more easily corroded, particularly in the parts of the trap above the water-level. To complete the black list, the flushing water is generally supplied through a very small pipe brought directly from the cistern used for storing drinking water. This description, which by the way, is not half black enough, ought to have been entirely unnecessary in the twentieth century, but as long as manufacturers and merchants continue to advertise the dangerous apparatus, so long must warning words be uttered. It would be a blessing if every pan-closet now in existence were at once declared a nuisance and removed. No one could reasonably complain that adequate warning had not been given, for as long ago as 1852 the apparatus was condemned by the now-defunct "General Board of Health" of this country.

Bramah's water-closet was followed by many others on similar lines. The improvements which were gradually made included the better flushing of the basin, the improvement of the valve so as to fit closely against the seating, the reduction of the size of the valve-box and the improvement of its shape, the introduction of a self-cleansing trap under the valve-box, the trapping of the overflow, and the ventilation of the valve-box. Fig. 1 shows such a closet, with the trap and part of the mechanism omitted. A is the basin of white-ware with flushing-rim, B the valve, C the lead valve-box with brass cover, D the ventilating socket of the valve-box, E the overflow from the basin trapped before its connexion with

the valve-box, and so designed that it receives a certain amount of water every time the closet is flushed, and thus the trap is kept charged, F the supply-pipe, and G the supply-valve with regulating thumb-screw. The valve-box is sometimes made of cast-iron enamelled inside, and occasionally of pottery. The ventilation of the valve-box is an important point, as it prevents the siphonage of the overflow-trap and affords an escape for foul gases generated in the closet-trap and valve-box. The ventilation-pipe may be carried through the external wall, and finished with crossed wires. In some closets the trap of the overflow discharges into the ventilation-pipe, and not directly into the valve-box. The object is to prevent the lower portion of the overflow-pipe or trap being blocked with paper or soil. More commonly, however, the valve is placed so as to cover the end of the overflow when the valve is open; this is the arrangement shown in fig. 2. The overflow-arm shown in the illustration is not of the best design, as it cannot possibly be cleaned.

It will be observed that the basin retains a large quantity of water, and an arrangement must be adopted whereby this quantity will be supplied automatically after the handle of the flushing apparatus has been released. One of the best-known devices for this purpose is the bellows-regulator shown in fig. 2. When the handle A of the flushing apparatus is raised it lifts the lever B, which actuates the valve of the closet, and also raises the lever C, which is pivoted at D and attached to the supply-valve at E. The lever C raises the spindle of the supply-valve and admits water to the basin, and at the same time raises the spindle and valve of the regulator into the outer compartment, from which the air can only escape through the small cock. When the handle of the closet is released the valve-lever B at once drops back into position and closes the closet-valve. The lever C, however, can only descend as the air is expelled through the cock of the regulator; consequently the supply-valve E does not close for some seconds after the handle has been released. The quantity of the after-flush can be regulated by adjusting the air-cock on the bellows-regulator. The device shown at G in fig. 1 is another arrangement for regulating the after-flush.

The supply pipe and valve are usually only 1 in. in diameter, but this is often too small to give an adequate flush and after-flush. Where the cistern is less than 10 ft. above the closet the valve should be 1½ in.; where it is less than 6 ft. the valve should be 1 in.

Some plumbers do not connect the overflow-arm and the valve-box, but permit the overflow to discharge on to a lead safe under the closet, from which it escapes by a pipe to the open

air. This is a very faulty arrangement and often causes great annoyance, particularly if (as is often the case) the closet is used to receive slops. Unless the handle of the closet is held up during the whole time occupied in emptying the slops, these, mixed with the water contained in the basin, will overflow and foul the safe and give rise to unwholesome emanations. Even when the overflow and valve-box are connected the pouring of slops into the basin will foul the overflow-arm and trap, and as these are generally inadequately flushed, the surfaces will in time become very nasty.

The ordinary valve-closet has its trap below the level of the floor. This position is very unsatisfactory, as it renders inspection and repair of the trap more difficult. It is a better plan to raise the whole closet on a step, so that the trap is above the main floor. When (as is generally the case) the closet is enclosed with woodwork the step is not objectionable. Some sanitary authorities wisely insist on the joints at the outlets of closets being above the floor level, and the ordinary valve closet is rejected as it does not comply with this regulation. Special valve closets are made to meet the difficulty, an example being given in fig. 3. In this the valve-box, closet-trap, and overflow-trap are formed in one piece of stoneware. An inspection-opening, fitted with a ground cap, is formed in the top of the trap at A, and a ventilating socket is formed on one side of the valve-box. The closet cannot be recommended; the trap is of such a shape that deposits are almost certain to occur in it, and there are other defects which need not be particularised.

Valve-closets are also made in "pedestal" form—that is to say, for standing without wood enclosures; but some of these are far from pleasing in appearance. One of the best examples is given in fig. 4. In this the valve swings in the trap of the closet, the separate valve-box being entirely omitted. The valve is operated by a lever and two bevelled cog-wheels, and when open, fits into a recess at the side of the trap, so as not to interfere with the flow of the water. The overflow arm has a large opening at the top for the insertion of a brush, and is arranged to receive a small portion of every flush. The outlet of the trap is well above the floor. This closet is practically a wash-down closet with a valve inserted to raise the level of the standing water in the basin.

The great advantage claimed for valve-closets is that they retain a large quantity of water in the basin. This gives a large surface for the reception of the soil, and consequently prevents the fouling of the basin and other objectionable results; it also ensures a thorough removal of the contents of the basin when the valve is opened. The disadvantages are, that the closets are complicated, the mechanism is apt to get out of order, and the valve does not always fit tightly on its seat. Notwithstanding the high praise which the valve-closet has received, it is gradually being discarded. The invention of good forms of wash-down closet did much to lessen its popularity, and the siphonic closet, which gives an equal water-area in the basin, seems destined to complete the process. Some of the most noted manufacturers of sanitary fittings do not even trouble to show a single valve-closet in their catalogues, while others devote the smallest possible space to the subject.

The "Trapless" valve-closet was an attempt to simplify the mechanism of the ordinary type of valve-closet. The hinged valve was replaced by a plug attached directly to the handle by a vertical spindle, and working in a small compartment communicating with the basin by means of a large opening. When the plug was raised, the contents of the basin escaped through the opening under the plug to the soil-pipe below. The supply apparatus was regulated by a ball-cock or float in the plug chamber. The objections to this closet are that the plug is certain to be fouled by the soil, and that foul air is forced into the room whenever the plug is raised. The small ventilation-pipe sometimes inserted below the plug seating is of very little use as a preventative of the latter defect. The insertion of a trap below the plug seating is the obvious remedy, and this has been done in Jennings's improved plug-closet shown in fig. 5. The basin and trap are made in one piece of glazed earthenware; the plug is connected by a vertical spindle to the handle A, and fits on a seating at the tapered part B; the regulating supply-valve is

shown at C. The plug is hollow and forms the overflow, and is fitted with a ball trap. This closet is undoubtedly an improvement on the original form, but the plug is certain to get fouled, and may be prevented (by paper or soil) from fitting tightly against the seating. The absence of a flushing-rim, and the flange-joint at the floor level are also defects, but the closet is also made with an adjustable P-trap, the outlet of which is above the floor level. The closet has the advantage of retaining a large quantity of water, which deodorises the soil and prevents the fouling of the basin, and also ensures the soil being carried with considerable velocity into the trap, but it cannot be recommended for use at the present day.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, CARDIFF.—On the 3rd inst. the foundation-stones were laid of the Central Congregational Church, Cardiff. The new church is erected from plans by Mr. W. Beddoe Rees, architect, Cardiff. It will be built of New-bridge stone, faced with Bath stone, and relieved with red Cumberland stone pilasters. Accommodation is provided for a lecture hall to seat 750, with vestries and classrooms, and the chapel proper to seat from 1,000 to 1,100. The total cost is estimated at 5,000.

WELSH CHURCH, PENTREBACH, MERTHYR, GLAMORGANSHIRE.—The new St. James's Welsh church at Pentrebach, near Merthyr, was consecrated recently. Mr. Penry Williams was the architect, and Mr. John Griffiths the contractor.

METHODIST CHURCH, CHESHUNT.—A Methodist church in the High-road, Cheshunt, was opened on the 19th ult. Mr. John Willis, of Derby, was the architect.

CONGREGATIONAL CHAPEL, CARDIFF.—A new Congregational chapel has just been opened in Clare-road, Cardiff. The building was erected, at a cost of 1,200*l.*, by Messrs. Lattey & Co. Messrs. James & Morgan were the architects.

INFANT SCHOOL, RUGBY.—The new infant school recently erected at the rear of St. Matthew's school premises in Pennington-street was opened on the 21st ult. The new building, of which Mr. J. T. Franklin was the architect, was erected by Mr. A. Harris. It consists of one large apartment, which, when occasion requires, will be divided into two by means of a folding screen with glass panels. The space on one side of the screen is 24 ft. by 22 ft. 6 in., and on the other 19 ft. by 22 ft. 6 in. The walls are of red bricks, with a dado of glazed bricks in three colours; the floor is of wood blocks, and the ceiling is of pitch pine.

SCHOOLS, DONCASTER.—On the 2nd inst. the Mayor of Doncaster opened the new girls' school in Carr House-road, Hyde Park, built by the Corporation. It was decided to build a new girls' school, giving the boys the existing girls' places. The total accommodation provided by the Corporation schools now is:—Boys, 420; girls, 320; infants, 272; total, 1,012. This new girls' school is so arranged that two additional classrooms, accommodating 120 additional scholars, can be added any time when required. The central hall, cloakrooms, and lavatories are already provided to accommodate 120 extra children, whenever thought necessary. Owing to the site being a sloping one, it has necessitated deep foundations, and practically another story being built, which has been utilised at the back for caretaker's storeroom and separate covered playground for the girls. The school floors are carried on steel girders above the playground below. Access to the central hall from the playground below is obtained by means of a flight of steps. The inside of the schools throughout is similar in character to the schools previously built, and has wood-block floors, glazed brick dados, patent folding pitch-pine divisions, and oak furniture. The Corporation decided to improve the heating arrangements at the old schools, as well as provide for the new, and by the enlargement of the boiler-house and coal-cellar, and the substitution of a much larger boiler and chimney, the caretaker will be able to heat the whole range of school buildings, comprising twenty classrooms, &c., from the one boiler. The roadway has been widened and improved, and a new fence wall with iron palisading has been erected in front of the schools. Over the main entrance a clock-tower has been erected, with a striking clock and four illuminated dials. The work has been carried out from designs and under the superintendence of the Borough Surveyor, Mr. Crabtree.

SCHOOL, CRAIGLOCKHART, EDINBURGH.—The plans of the new school which is about to be erected by the Edinburgh School Board at Craiglockhart have now been prepared. Situated at Ashley-terrace, the school and playgrounds will occupy about an acre and a quarter of ground. The building will accommodate nearly 1,600 children. Two halls on the ground and first floors form a prominent feature of the internal arrangements. That on the ground floor, some 70 ft. by 30 ft. in extent, is designed for the use of the infant department, and the hall on the first floor for the use of other juveniles. On each floor eight

classrooms will enter off the halls. Rooms for the headmaster and the lady teachers, cloakrooms, and lavatories will also be provided on the ground floor, and on the first floor, in addition to the eight classrooms above mentioned, will be two smaller classrooms and rooms for the teaching staff. On the second floor nine classrooms will be provided, a gymnasium, a combined cookery classroom, and a workshop. In a corner of one of the playgrounds the janitor's house will be erected. Mr. R. Wilson

BAPTIST SCHOOLS, HISTON, CAMBS.—The foundation-stone of these schools was laid on Easter Monday. The school is divided off into a number of classrooms by means of swivel partitions, which, when thrown back, make one large hall. Two other large senior classrooms are provided, also infants' room, kitchen, classrooms for boys and girls, and the usual offices. The building has nave and aisles arrangement (the aisles dividing off into classrooms) and has timber columns and arches of quaint design, carrying clerestory. The whole of the internal joinery is to be stained transparent olive green and varnished. The external facing is of red brick with Bath stone dressings, and roofs of green slates. The contract is let to Mr. H. Feast, builder, Haddenham, Cambridge, and amounts to 1,852*l.* (architect's estimate, 1,875*l.*) The architects of the scheme and also of the church, recently completed, are Messrs. G. Baines & R. Palmer Baines, of London.

A YEAR'S BUILDING IN LIVERPOOL.—The Corporation Building Surveyor (Mr. William Gostraw) in his annual report states that the number of houses built in the city during 1900 shows a decrease from the number of the previous year, which was abnormal, being 1,573, against 2,358 in 1899. In Westtree 481 houses were erected during last year, West Derby 373, Toxteth Park 312, Walton 300, Old City 107. During the last five years 9,318 new houses have been erected in the city, the greatest increase being in Wavertree, with 2,331 houses. It is a remarkable fact that in this respect the old city stands second, with 2,218 houses. During 1900 no houses under an annual rental of 12*l.* were erected, and four only in 1899; from 12*l.* to 25*l.* rental, 1,038, against 1,500 in 1899; from 25*l.* to 35*l.* rental, 402, against 607; from 35*l.* upwards 133, against 137. The total number of buildings of all kinds erected during 1900 was:—New houses, 1,573; workshops, stables, and minor buildings, 110; new public buildings, offices, and manufactories, 47; warehouses, 3. Buildings taken down:—Houses, 899 (of which 584 were demolished by the Housing Committee); workshops, &c., 37; public buildings, &c., 11; warehouses, 5. The buildings of all kinds taken down during 1900 were more in number than in any year since 1896, inclusive.

WORKHOUSE HOSPITAL, HALIFAX.—A building has been erected at Salterbebble by the Halifax Board of Guardians to meet the need for increased hospital accommodation. The hospital stands on a site of about twelve acres, about a mile from Halifax on the Huddersfield-road. Plans have been prepared by the architect, Mr. W. Clement Williams, of Halifax, for a comprehensive scheme which will provide accommodation for 642 patients, in addition to which there are beds for about 100 nurses and servants. The total estimated cost is about 130,000*l.* It has been thought, however, that to meet the immediate requirements the provision of 400 beds for the sick would be sufficient, together with the complete scheme of administration buildings, for by this arrangement it would only be necessary to add an additional 242 as the need may arise for more beds. The Nurses' Home is the first building seen on entering from the Huddersfield-road, and is placed astride the centre line of the hospital. It contains accommodation for nurses and probationers, including general and separate sitting-rooms, library, dining-room, and lecture-room. There are in this block over seventy bedrooms. Immediately behind the Nurses' Home, the first floors being connected by a three-arched bridge, is the administration block, the ground floor of which is devoted to porters' rooms and storerooms. The first floor is set apart for committee-rooms, doctors', matron's offices and sitting-rooms, dispensing and matron's stores, with electric lift from the basement. There are also a large kitchen and a scullery, with larder, &c. On the south side of this floor is an isolated receiving pavilion connected with the main building by a bridge. On the same story of the eastern block are the assistant medical officer's apartments. The chief medical officer will be provided with a separate residence. The other administrative buildings are the electric light and power station, placed below the ground level, the boiler-house and disinfecting station, and the laundry. The buildings already referred to occupy the centre line of the site, which runs from east to west, and the ten pavilions for patients (five for each sex) are placed on the south side of the north and one on the north side of this central block. Corridors connect the administrative buildings with the pavilions, all of which are connected by one-story corridors with service subways underneath them. The subways allow of any pavilion being served from the kitchen or store without the hospital corridors being used. Eight of the pavilions are oblong and two stores high, while

the remaining two are circular and three stories in height. Outside the general hospital scheme and entirely isolated are two small pavilions for maternity cases, each containing four beds. The mortuary will also be an isolated building. There are fire-escape staircases for all the wards. The Guardians have had to take over the mason's contract (with Mr. Richard Charnock as manager), and the electric lighting, &c. (under the superintendence of Mr. Savile Watney), while the other principal local contractors are—Messrs. Hanson & Son, joiners; Messrs. Rushworth & Firth, plasterers; Messrs. Moss Brothers, painters; and Mr. Boocock, plumber. In connexion with the water supply, the water is supplied through Walker's health pipes, supplied by Messrs. E. Walker & Co., of Heckmondwike.

NEW WARDS, BRISTOL EYE HOSPITAL.—On the 26th ult. the new wards and operating theatre of Bristol Eye Hospital were opened. The extension of the hospital has involved an expenditure of about 6,800l. The enlargement consists of the addition of another story and the erection of a new wing at the back of the present premises towards the garden. The new story provides sleeping accommodation for the nurses and servants, some small wards for patients, and an operating theatre, and the new wing contains a sitting-room for the nurses and increased ward space. The kitchen has also been enlarged and refitted, and the whole hospital is supplied with electric lighting. The architect was Mr. G. H. Oatley.

EXTENSION OF PRESBYTERIAN CHURCH, RATHGAR, DUBLIN.—Christ Church (Presbyterian), Rathgar, is being extended. The work will consist of the addition of a transept, the extension of the existing transept, the erection of a chancel, with provision for the choir and a new organ, and the enlargement of the lecture-hall with additional classrooms. The work is being carried out by Mr. William Crichton of Rathgar, Messrs. Musgrave & Co., of Belfast, having supplied the heating and ventilating apparatus. Mr. W. M. Mitchell, of Dublin, is the architect.

JEWISH SYNAGOGUE, GLASGOW.—On the 27th ult. the foundation-stone was laid of the new Jewish synagogue in South Portland-street, Glasgow. Mr. J. Chalmers is the architect.

FLATS, NOTTING HILL.—A block of self-contained residential flats, to be known as Crescent-nansions, has just been erected on the site of No. 122, Elgin-crescent, W., from plans and under the direction of Messrs. Palgrave & Co., architects, Victoria-street, S.W. The style adopted is a modified Queen Anne. The general contractors were Messrs. E. Collins & Co.

BUILDING NOTES, ABERDEEN.—The District Lunacy Board has accepted the tender of Messrs. Henry & Keith, Aberdeen, for the joiner work of the new asylum at Kingsent, Newmachar, Mr. A. M. Mackenzie, A.R.S.A., architect. The contract price is 116,526l.—The Committee of Aberdeen City Parish Council have agreed to provide accommodation for 660 inmates in the proposed new poorhouse at Oldmill, Messrs. Brown & Watt, Aberdeen, architects.—The various bodies concerned have approved of the plans (by Mr. A. Marshall Mackenzie) of new Greyfriars Church, corner of Queen-street and Broad-street, estimated to cost 10,000l. The entrance will be at the west end from Broad-street, where will be a tower 32 ft. square, rising to a height of 100 ft., and with steeple to 150 ft. The Queen-street elevation shows a series of seven three-light windows, and above them another series in the nave. The church will consist of a spacious nave with central passage along the entire length, and an apse at the end in which will be placed the stained glass windows from the old pre-Reformation church, a building which is to be removed in connexion with Marischal College extension. On the north side of the apse is the vestry. The organ chamber is opposite, and beside it the choir will be accommodated. To the south will be a side aisle separated from the nave by three stone arches supported on pillars. The height in the nave from floor to ceiling is 40 ft., and the arches of the aisle are 20 ft. high. At the west end will be a small gallery over the vestry. The whole will provide for 800 worshippers. In basement floor will be a hall seated for 300, session-house, guild-room, and heating chamber.—Aberdeen Town Council have accepted the tender of Mr. Leslie Smith, Aberdeen, for the mason work of the new Corporation Electric Station at Ferryhill amounting to 7,555l., and also that of Green's Economiser Company, Limited, for an economiser, 1,203l. The architects are the Corporation's Electrical Engineer and the Corporation's Gas Manager.—The Secretary for Scotland has consented to a further loan of 81,000l. for the electrical department, making the total borrowing power under the Electric Lighting Order, 1899, 185,000l.

CO-OPERATIVE PREMISES, BIRKENHEAD.—A new building in Catherine-street, Birkenhead, for the local co-operative society was opened on the 30th ult. The architect was Councillor Snape.

HOSPITAL EXTENSION, BRISTOL.—A meeting of the Bristol Health Committee was held on the 2nd inst., when the City Engineer presented plans and drawings for extensions at Ham Green. The erection of a new pavilion, the floors with provision for twenty-four patients on the ground floor and

twenty-eight patients on the first floor, with the necessary offices was estimated at 13,300l. The design was generally in accord with the pavilions already constructed, except that it would be longer and considerably higher. It was also considered necessary to have increased accommodation in the administration building, and, by the building of an additional wing at the back of the old house, provision was made for thirteen beds for servants on the ground floor and for thirteen nurses on the first floor. The estimated cost of the alterations and extensions was 3,100l. Designs for an additional isolation block, larger than the present one, were also presented. The plans showed a pavilion with accommodation for four one-bed wards and three two-bed wards, and the estimated cost was 3,260l. For extra cost of providing electric light, water, drainage, roads, fencing, &c., a sum of 1,400l. was put down. The design for the water-tower, submitted on the last occasion, was considered of too expensive a character, so he had reduced it to its absolute minimum. It would be simply a tank constructed on cast-iron pillars, and the cost was estimated at 1,750l., with 550l. for the cost of obtaining the loan and supervision. The plans and designs were referred to the Hospital Sub-committee to bring up a report on the same.

PROPOSED RECONSTRUCTION OF THE CATTLE MARKET, TRURO.—An inquiry was held at Truro on the 3rd inst. by Mr. W. O. E. Meade King, M.Inst.C.E., on behalf of the Local Government Board, respecting an application by the Corporation for sanction to borrow 5,400l. for the entire re-modelling of the cattle market. Details of the new market, which, by the addition of a new piece of land, will cover 6,588 square yards, were explained by Mr. Lea, the Surveyor and Engineer.

PROPOSED ISOLATION HOSPITAL FOR LONGTON, STAFFORDSHIRE.—At a recent meeting of the Longton Town Council the Sanitary Committee submitted a report from Mr. Hare, the architect appointed to prepare the plans of the proposed isolation hospital. The report was accompanied by drawings showing the arrangements suggested to meet the possibility of the settlement of the site owing to mining operations. The scheme includes administration and laundry blocks, two ward blocks containing eighteen and fourteen beds respectively, and isolation blocks containing eight beds. The total cost of the buildings as proposed would not exceed 8,000l. Mr. Hare had submitted the whole of the proposed construction to the Local Government Board, and had received an unofficial assurance that for the purposes of a loan they would regard the buildings of as permanent a nature as if built of brick. At an interview with the committee Mr. Hare explained that it was intended to construct underneath the whole of the site a concrete bed, with steel joists, at least 18 in. thick, and in his opinion there would then be very little risk of damage by mining subsidence. The committee recommended that the buildings be constructed of bricks and mortar, and that Mr. Hare be directed to proceed with the preparation of the plans and specifications immediately. The report was adopted.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, GOOLE.—At the meeting of the Gas and Water Committee of the Goole Urban Council recently, the engineer for the new waterworks at Follington (Mr. J. C. Melliss) reported that the contractor had constructed the well 80 ft. deep and 10 ft. in diameter, lined with blue bricks in cement, and made the 20-in. borehole to a depth of 130 ft. from the bottom of the well, making a total depth of 210 ft. from the surface of the ground to the bottom of the borehole. He had also carried out the test pumping, and during twelve and a half days of continuous pumping some eight million gallons of water had been lifted from the well and borehole, and throughout there had been no diminution in the quantity which the well and borehole are yielding. Careful records have been kept, which show the yield of the well and borehole to approach nearly 700,000 gallons in the twenty-four hours, being ample for the present requirements of Goole and for a considerable time to come, and also for the supply to such adjacent villages as may require it.

WATER SUPPLY, LOOE, CORNWALL.—At a recent meeting of Looe Urban Council, Messrs. S. W. Jenkin & Son, of Liskeard, the engineers of the proposed water scheme, reported that they believed the conditions and requirements of riparian and other owners had been at length satisfactorily settled. The surveyor, acting on behalf of Mr. Somers Cocks, had visited the site, and the rights to be conveyed to the Council had been accurately defined to the mutual satisfaction of all interests. The map required by the Liskeard Highway Authority had been prepared, and would be forwarded with the required assurances to them, and the way was now quite clear to invite tenders and enter into contract for the construction of the works. After discussion, it was resolved that the Council themselves purchase the pipes and valves, and the clerk was instructed to obtain tenders from firms approved by the engineers, and that tenders for laying the mains and constructing the reservoir be invited as soon as possible.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. George Wragge, craftsman in metal works, stained glass, &c., has removed his London premises from No. 22, Surrey-street, Strand, to No. 211, Shaftesbury-avenue, Oxford-street, W.—The Blackman Ventilating Company, Limited, have acquired from Mr. James Keith, C.E., his business as heating engineer (with departments in gas and hydraulic work), carried on at Farringdon-avenue, E.C., and at his foundries and engineering works in Arbroath. The company will be carried on under the new name of James Keith and Blackman Company, Limited.

PUBLIC IMPROVEMENTS, BRIGHTON.—On the 22nd ult. Mr. H. H. Law, M.Inst.C.E., Local Government Board Inspector, held an inquiry at the Town Hall, Brighton, with reference to the application of the Town Council for sanction to the borrowing of sums amounting to 10,600l. for purposes of electric lighting, and 8,400l. for works of sewerage. Mr. J. Christie, the Electrical Engineer, gave evidence. It was stated that the sewerage works consisted of the construction of a sewer in Lewes-road and the provision of flushing hydrants and sewer ventilators.

PROPOSED NEW STREET, DONCASTER.—On the 22nd ult. Mr. M. K. North, A.M.Inst.C.E., held a Local Government Board inquiry at Doncaster into an application by the Town Council to the Board for the approval of the purchase and exchange of certain land, the sale of consolidated stock, and the appropriation of the proceeds of such sale, or of the sale of Corporate land, towards the cost of the purchase of the aforesaid land, and of the formation of a new street from the corner of the Corporation Baths in French-gate to the commencement of High Fisher-gate, at its junction with Church-street. It was stated that the Borough Surveyor had made an estimate of the total cost of the work, which was 3,700l. The plans were explained by the Borough Surveyor, Mr. W. H. Crabtree.

SLUMP IN THE RED BRICK TRADE.—Building brick makers in the Oldbury, West Bromwich, and Tipton districts are now passing through the severest crisis experienced for many years. Twelve or eighteen months ago prices of common red bricks were raised to an unusual height by the rapid development of house building, not only in the immediate neighbourhood of the works, but also in London, Birmingham, and other large towns. Prices realised about 34s. per 1,000, compared with the normal rate of about 20s. On the strength of the "boom" old brickworks were extended and new works opened, causing the production of builders' bricks to reach enormous proportions. The extra demand for slack for the brickworks was an important factor in raising the price of that article from about 6s. to 10s. per ton. The usual result of over-production has followed in the slump now experienced, as most of the chief brickworks in the districts named have been working short time with no immediate prospect of improvement, while prices have been slowly declining for the last three months. Instead of 34s. per 1,000 the present selling price is, as one firm expressed it, anything between 25s. and 18s., and even a lower price is mentioned where large contracts have to be tendered for. Building operations in all the district towns seem to have been for a time suspended by common consent until the price of slack, and consequently that of bricks, is further reduced. More than half the present price of bricks is said to be absorbed in fuel, leaving little or nothing for labour and establishment charges. The practical result has been that brickmakers have recently incurred the heaviest losses known for thirty years.—*Birmingham Gazette.*

BRIGHTON MASTER BUILDERS.—The annual dinner of the Brighton Master Builders' Association and their friends was held at the Hotel Metropole on the 1st inst. The Chairman (Alderman W. Botting, J.P.) presided, and about sixty sat down to dinner. After the loyal toasts, Mr. G. S. Godfree proposed "The Imperial Forces," and Councillor Buckwell responded. Mr. J. K. Nye gave "The Corporation of Brighton." Councillor Cresswell, in a brief reply, said that although Brighton and Hove were practically one town, it did not follow that it would be better for both to be governed by one authority. The toast of the evening, "The Association of Master Builders," was next introduced by Mr. Gates, who said the Association was brought into existence about ten years ago by a strike. They accomplished the object they had in view, and the Association had prospered ever since. There had been no further trouble of the kind since. A Trade Defence Association was very desirable, especially in their trade. The number of members and subscriptions had been fully maintained, so much so that during the past year the subscriptions had been reduced 50 per cent. A peculiarly gratifying feature of the Association was the Insurance Company which was formed in view of the liability of employers under the Employers' Liability Act. Although only 4s. in the £ had been called up, there was a balance of something like 5,000l. to meet any liability, and the interest practically sufficed to pay the working expenses. He coupled with the toast the name of Alderman Botting, to whom the formation and success of

the Association was greatly due. In responding the Chairman said the object of the Association was to prevent strikes, and in that they had been successful. During the past year the only important thing that happened was the reception of a deputation from carpenters and joiners, who wanted more money and the fixing of certain rules, which would place them in a position to dictate who should do the work. That the Association would never submit to these rules had been tried in other parts of the country, and had they had worked, having had a great deal to do with causing strikes. He was glad to say the finances of the Association were in a healthy condition. The Builders' Association of the country had joined hands in providing a sum of over 21,000l. for the building of homes at Bisleigh for invalid soldiers from the war. That he looked upon as a splendid thing, and he hoped the remaining 9,000l. or 10,000l. needed to complete the scheme would speedily be obtained. The Insurance Company had been a great success, and by July they would have 5,300l. in hand to meet any liability. If they wound it up at once they were in a position to hand to every one who had paid 4s. a sum of 18s. Of course they paid all claims most cheerfully, and had a fund for the protection of their workmen. Other toasts followed.

BUILDING TRADES IN CHICAGO.—In a despatch to the Foreign Office, dated last month, Mr. Wyndham, the British Consul at Chicago, U.S.A., writes that building has been conducted during the past year under the greatest difficulties, and very few undertakings have been brought to a satisfactory ending. It is said that building contracts amounting to nearly 40,000,000l. are waiting to be signed as soon as it is certain that they can be carried through without interference. Many of the unions have signed contracts, with an arbitration clause, for three years, and with the cheap rate at which iron can now be purchased a prosperous future for the trades seems probable. Iron is more used in building every year, and enamelled terra-cotta is coming into favour as a substance which will not absorb the smoke and deteriorate. The year was disastrous for the brickmaking industry in Chicago, only 275,000,000 bricks, or 50,000,000 less than in 1899, being sold. Prices have not varied in the last three years, and are from 21s. 10d. to 25s. per 1,000 delivered. A great quantity of cement is used, but it cannot be ascertained that any of this is British. The local and German makers seem to have the trade, and, it is said, sell at much lower prices than the British makers.

PROPOSED PROMENADE, PENMAENMAWR.—On the 29th ult. a Local Government Board inquiry was conducted at Penmaenmawr by Mr. H. P. Boulnois respecting the promenade which it is intended to construct at that place at a cost of 17,000l. Mr. Ernest Worrall, Engineer to the Council, explained that treaties had been carried through for the acquisition of the freehold of the existing public beach, about thirteen acres in extent, and for certain facilities and better access across the line of railway. The works would extend nearly a mile along the front, from Dyffryn-road to Messrs. Brundritt's pier at the west end.

ELECTRIC LIGHTING AND DESTROYER SCHEME, CLECKHEATON, YORKSHIRE.—On the 29th ult. Colonel A. G. Durnford, R.E., an inspector to the Local Government Board, held an inquiry at Cleckheaton Town Hall in reference to an application by the District Council for sanction to borrow 25,000l. for the purpose of electric lighting and the provision of a refuse destructor. Evidence was given by Mr. C. Lund, Surveyor; Mr. A. H. Gibbins, Electrical Engineer; and Mr. Mortimore, representing Messrs. Meldrum Bros., Manchester, whose system of refuse destruction it is proposed to adopt.

BELFAST BUILDERS' ASSOCIATION.—A special meeting of the members of this Association was held on the 2nd inst. at the secretary's offices, 37, Ann-street, when the following resolution was unanimously adopted: "That the systematic watching, intimidating, and besetting of willing workmen now prevailing is intolerable, and employers are requested to inform the secretary of the Builders' Association of all cases of 'picketing' occurring at their works, so that immediate steps may be taken to prevent their recurrence, and, if necessary, prosecutions instituted under the Conspiracy and Protection of Property Act, 1875."

SCAFFOLDING ACCIDENT AT BIRMINGHAM.—Seven men who were engaged in the erection of a building in Eyre-street, Birmingham, were injured by the fall of the scaffolding on the 8th inst. The scaffolding was fixed upon girders near the roof. Two of the planks forming its basis suddenly snapped and the whole structure fell, carrying with it the seven men to the ground, 30 ft. below. The men were taken to the hospital, and four of them were detained suffering from serious injuries. One of them has since died, and another is not expected to recover.

CAPITAL AND LABOUR.

PENRYN QUARRIES.—As was anticipated in the district, the mass meeting of the quarrymen only strengthened them in their determination not to resume work until they receive some concessions.

ABERDEEN PLASTERERS' DISPUTE.—Through the good offices of Baillie Taggart and Courthill

Milne, a conference of representatives of the Aberdeen master plasterers and the operatives, who have been locked out since February 23, was held on the 2nd inst. in the Grand Hotel with the view, if possible, of arriving at a compromise. It may be recalled that the lockout was the result of the operatives refusing to accept a reduction of wages from 8d. to 7½d. per hour, given notice of by the masters. Baillie Taggart, in opening the proceedings strongly urged that the dispute should be settled by compromise. He suggested that in order to bring about this both parties might agree to recommend to their respective associations a wage of 8d. per hour. Neither side, however, indicated the slightest inclination to give way, and after some further discussion it was agreed that both parties should separate with the view of discussing the situation. The operatives' representatives accordingly retired, accompanied by Baillie Taggart, while Mr. Milne remained with the masters. When the joint conference resumed Baillie Taggart announced that the men's representatives considered 8d. per hour a fair compromise, and he asked the representatives of the employers if they were prepared to recommend such a compromise to the masters' association. After some discussion the masters' representatives expressed their readiness to recommend to their association 8d. per joint minute was drawn up, and signed by the Secretaries of both parties.—"The employers and employees present consider wages at the rate of 8d. per hour as a fair and reasonable settlement of the dispute. They also agree to recommend to their respective constituents that this compromise be accepted." This recommendation will come before the employers' and operatives' associations respectively for consideration, but it may also be explained that before any final settlement can be arrived at the recommendation must be approved by the Executive of the operatives' association in Glasgow.

SHEFFIELD PLUMBERS' STRIKE.—The strike of the Sheffield plumbers has ended, and the men, nearly 300 in number, have commenced work again. Since the strike negotiations have been carried on, and, finally, the men signified their willingness to observe as the masters' "new rules of working," which have been one of the main points of contention in the dispute, and they do this notwithstanding that their demand for an increased rate of wages has not yet been conceded. It is one of the conditions of the settlement, however, that the demand for 3d. an hour extra wages shall go to arbitration by the Board of Trade arbitrator. Another condition of the settlement is that the master plumbers shall all take back their former workmen.

THREATENED STRIKE AT GOSPORT.—The bricklayers and labourers of Gosport have notified the master builders of the town that unless the masters grant their demands of a halfpenny per hour increase all round, and a set of rules, they will come out on strike on May 6. The bricklayers at present receive 7½d. per hour and the labourers 5½d.

LEGAL.

DAMAGE TO ROADS BY TRACTION ENGINES.

At the Thirsk County Court on the 3rd inst. Judge Temple was occupied in hearing an action brought by the Thirsk Rural District Council against Thomas Harrison, contractor of Stamford-bridge, for the recovery of 136l. 10s. damages for injury to the Boroughbridge and Durham main road and to the Ripon and Carlton Miniott Township main road.

The case for the claimants was that the roads had been damaged to the amount named by a traction engine and waggon used by the defendant between June 20 and July 12 last, when he was leading gravel for Lord Leonfield from the Asenly gravel pit. Evidence as to the reasonableness of the sum claimed was given by Robert Wright, Assistant Surveyor for the plaintiffs; W. H. Dixon, Surveyor to the Stokesley Rural District Council; John Scott, Surveyor to the Bedale Council; John Robert Greenshaw, Surveyor to the Pocklington Rural Council; W. Southern, civil engineer, Hull and Beverley; and Peter Jesspill, Surveyor to the Hornsea Authority.

The defendant gave rebutting evidence as to the weight of gravel carried in the waggons drawn by his engine, and John Thompson, who drove the engine, deposed that no complaints were made to him at the time, and he made thirty-six journeys in fourteen days. He considered that the engine was improving the roads. Mr. Beverley, on behalf of the defendant, submitted that the claim was an extravagant one.

The Judge gave a verdict for the plaintiffs for the full amount claimed, with costs on the higher scale.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

24,426.—COMBINED LIFTING, WEIGHING, AND INDICATING APPARATUS: *W. Timmermann and H. Dörschlag*.—A weighing contrivance, for attachment to the hook of a crane or similar hoisting machine, comprises a spring above which is a plate

which carries the suspension-hook. The compression of the spring causes a stud upon the plate, that works within a spiral groove, to turn the stem of the stem being joined by means of bevel gearing to a shaft upon which the indicating mechanism is carried. The latter mechanism includes a pointer (upon the shaft) which, when it has traversed the dial once, is carried forward that it may register weights heavier than the 200 kilogrammes marked upon the dial. Ratchet gearing provides for the indication upon the dial in kilogrammes and upon a third dial in higher units of the aggregate of a series of weighings.

24,441.—A CONTRIVANCE FOR USE WITH ELECTRICAL ALARM BELLS: *L. Davoine*.—The circuit-closing device comes into operation at the melting of a fusible plug within the push, as the plug becomes heated its surrounding spring forces out a cap on to a spring so as to close the bell circuit. The fusible plugs may be also adapted for telephone circuits.

24,480.—DRAWING AND OTHER PINS: *F. H. Shaw*.—The pins are fashioned in various forms. The chief feature of the invention consists in fitting them with strips or pieces of leather, fabric, or other material, with which they may be readily drawn out of the board. In one shape the ends of a cord or strip are passed through holes in the head of the pin and a clamping disc is fastened to the under side of the head.

24,504.—A LOWERING APPARATUS FOR FIRE-ESCAPES: *W. Benson*.—The two cages are caused to ascend and descend alternately as their ropes are wound in opposite directions upon two pulleys mounted on one shaft, which at each of its ends abuts against movable plates held with springs. The springs serve to keep in check the revolutions of the shaft as well as its movement lengthwise, since one end of the shaft is screwed and works within a nut. When either cage is raised to the top it is sustained with spring arms which slide above and then drop over the beam, and can then be freed by hand.

24,511.—A METHOD OF HEATING WATER: *J. Winterfoot*.—The appliance, available for domestic and other purposes, combines a water-heater, a thermostatic gas-regulator, and a valve which controls the supply of water. The heater comprises the outer casing and inner casings of a central boiler or chamber. The thermostat is affixed through the outer casing of the heater beneath the boiler, and its valve-rod is worked with levers moved by a lever that is hinged on to the operating-rod, and a float upon the water in an upper vessel regulates the water-supply valve.

24,534.—A PAINT: *T. Möller*.—For making an air and water-tight paint, an admixture is compounded of milk of chalk (or else English red or ochre), rye meal, iron, vitriol, coal tar (or else wood or Finland tar), lime and water; if red or ochre and wood or Finland tar are used, the lime may be discarded.

24,552.—THE MOULDING OF BRICKS: *A. L. Maynard and J. Walls*.—Curved steel blades force the clay from a hopper through a die into the moulds, the blades being mounted upon a squared part of the shaft with U-shaped bolts which pass around them and through a clamp-plate; the moulds, open at both ends, are carried between guides upon a table or rollers, or else upon jointed bottoms, so as to form an endless chain. As the filled moulds are passed around a pulley they are taken away, and the empty moulds are put upon the bottoms as the latter are passed around another pulley.

24,567.—THE CONTROL OF CONTINUOUS CURRENT MOTORS FOR CRANES, LIFTS, HOISTS, &c.: *J. S. Stevens, C. G. Major, E. C. Stevens, and P. H. Stevens*.—The apparatus combines a multiple-contact switch with means of automatically cutting out resistances at starting and of putting them in at reversing or stopping. As a winding-drum revolves upon a shaft its wave-groove causes to oscillate an arm that is linked to a crank which has a pawl set in engagement with a ratchet-wheel, and the ratchet-wheel is set in frictional engagement with the arm of the switch. As soon as the motor has been started the switch-arm becomes automatically turned until it forms the lower end of its slide and the starting-resistance is cut out of the circuit, whereupon the ratchet-wheel slips and does not move the switch-arm, one end of another pivoted lever engages with a cam-groove in the stopping and reversing shaft, which, as it turns, moves the switch-arm back to its former place. The specification extends to various modifications of the apparatus.

24,568.—THE MOULDING OF BRICKS: *S. R. S. Bailey*.—A hand-lever upon a cross-shaft works the upper pressing-plunger, a crank or cam upon the shaft moves between rollers of the crosshead of the plunger, and at each end of the shaft is a weighted arm that balances the moving parts, one of the arms may constitute an extension of the hand-lever; rods that slide through a crossbar are attached to the lower plunger, the length of their slide being adjusted with nuts in accordance with the desired thickness of the bricks. The main working parts are arranged above the mould in order that they shall not become clogged with grit, &c., from the mould, and the machine—which is mounted upon wheels—is moved and steadied with its weighted side-handles.

24,585.—PAINT, DISTEMPER, AND WHITWASH BRUSHES. The inventor makes the brushes with bristles that on the outer side of the brush are longer than the bristles within, and he fills the top space with two segmental pieces of vulcanite or gutta-percha fitted with pegs; the segmental pieces are put into their position after the bristles have been bound with copper wire, the knot is dipped into cement, and then the blade of the handle is forced in.

24,602.—A RETAINING PIECE FOR PIPES: O. Egger. An appliance for holding or clamping pipes against walls or other brickwork consists of two parts, one of which is fashioned with an extended blade at its one end and the half of a ring at the other end, the portion between them being fashioned with openings and a channel that will take a wedge-shaped key; the corresponding part consists of a half ring and the other half of the portion into which the key is to be forced. When the two parts are wedged together with the key, the completed ring holds the pipe and the blade is secured in the masonry.

24,611.—THE MANUFACTURE OF TILES, BLOCKS, CONDUITS, PIPES, &c.: J. C. Sellars.—Some such binding material as glue water, together with lime, cement, sulphate, or other solution of alumina, protosulphate of iron, &c., are compounded with slag, clinker, or residue from a refuse destructor; when the moulded articles have been dried, they are placed in a solution of silicate of soda, silicate of potash, or other alkali under pressure. The goods may be rendered waterproof by dipping them into an acid, or a solution of alumina or a salt of iron, whilst pipes and conduits may be fired and glazed. For effecting a ready combination of the residue with the silicate solution, some silicious substance such as salt, sand, or spent lime should be mixed with the former material.

24,615.—TILES OR PLATES FOR BUILDING PURPOSES: F. Pagnon.—The facing tiles, made of earthenware, cement, glass, or other material are laid with their face downwards upon a table within a mould, and they are bonded together with a cement, which is poured into the mould, and forms a backing for the tiles. In the cement is embedded wire netting, which is laid so as to project beyond the edges of the tiles; the made-up slabs can be cemented on to the surface of the wall, and they can be separated from one another, or from the wall, by pulling the overlapping edges of the netting.

24,647.—PORTABLE COMPASSES: H. Cowley.—These are made in the form of a metallic cylinder, at whose upper end is a shoulder, which supports the container and its cover. The ringed groove of a disc, that stands upon the feet, carries the lower portion of the cylinder. At the top of the cylinder are fitted a seat and a hinged cover. The parts described can be easily detached from one another, and be packed in a box or case of suitable shape.

24,651.—A FLUSHING APPARATUS: J. Woodbury.—A spring serves to hold the pivoted working-lever in its normal and closed position. A tubular discharge valve is arranged at the base of the closed tank so as to operate within a cylinder, and is joined with a rod that is passed through a pipe and is attached to the end of the working lever above. The flush escapes through ports which are made around the lower edge of the cylinder which surrounds the discharge-valve, whilst the upper edge of the cylinder is made larger than it may take the packing and the compressing upon the valve. During the time that the valve is shut the packing remains seated upon the raised edges. The spring underneath the lever acts so as to keep the valve closed; the spring may be disposed in a horizontal position and be caused to bear upon a rod whereof one end is pivoted on to the inner end of the lever.

24,687.—A FLUSHING APPARATUS: J. Woodbury.—The filling of the closed tank from the supply-pipe (which is always open) causes air to escape until the water has attained a certain height and then a valve traps the air, the leakage from the valve and air being conveyed through a tube to the flushing-pipe. Within a cylinder that is closed at its top and has ports around its lower edge is a tubular discharge-valve, which starts the flush when raised by a crank-lever movement.

24,753.—A HOLDER FOR WINDOW-SASHES: A. Forin.—A wedge-shaped pawl, which is carried upon a bearing in a casing placed within a recess of the jamb, is to be turned with a handle-rod; on the sash is a rack whereof the notches are engaged by a spring that presses against the pawl. Of the two pawls for each sash, the lower one can be turned down for securing the lower sash.

24,788.—WATER SUPPLY (DOMESTIC): J. E. Kieching.—The pull-chain is secured to the end of a crank upon the axle which carries a tipping-vessel placed within the tank; in order that the float-lever may have play and that it may be sustained in the lifted position whilst the tipping-vessel is tilted, the axle is also cranked for a portion of its length between the sides of the vessel, which can be made to tilt automatically and be adapted for use with urinals.

24,812.—BRICKS, BLOCKS, SETTS, &c., FOR PAVING AND SIMILAR PURPOSES: E. Reese.—The articles are intended to be used as paving-stones and conduits, for channelling, and so on. They are made of granite, slate, or stone quarry refuse com-

pounded with pitch, tar, bitumen, alum, and sulphur, and are moulded under pressure.

24,824.—INCANDESCENT LAMPS: C. Howard.—The inventor provides that the long neck of the bulb may be divided and be fused together again when a new filament has been cemented to the leading-in wires; little cups of metal fit into two opposite recesses in the neck, and small holes in a cap upon the shoulder register with the cups, so that the melted solder shall pass through the holes and fill the cups; the device is intended to make the cap movable and to render the use of cement unnecessary for fastening the cap.

MEETINGS.

FRIDAY, APRIL 12.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Iron-lined Tunneling Construction," by Mr. A. Woodroffe Mantou, 8 p.m. Glasgow Architectural Craftsmen's Society.—Mr. J. K. Edwards on "Warm-air Heating Apparatus and the Building Preparations Necessary," 8 p.m.

SATURDAY, APRIL 13.

Institution of Junior Engineers.—Visit to Great Northern and City Railway Works to inspect plant. 3.30 p.m. British Institute of Certified Carpenters.—Mr. G. Ellis on "How is the Future Workman to be Trained," 6 p.m.

MONDAY, APRIL 15.

Royal Institute of British Architects.—Special general meeting (business) (1) to receive and consider a recommendation of the Council that Mr. Wm. Emerson, President, be requested to allow himself to be nominated as President for the ensuing year of office; and that, consequently, by-law 26 be suspended; (2) to sanction alterations in the Institute form of contract. 8 p.m. Surveyors' Institution.—Mr. Walter C. Ryde on "The Rating of Public Houses," 8 p.m. Literary and Architectural Society.—Mr. A. S. Flower, M.A., on "Old English Architecture: A Retrospect and a Suggestion," illustrated by limelight views. 6 p.m.

TUESDAY, APRIL 16.

Institution of Civil Engineers.—Mr. H. E. Jones on "Modern Practice in the Manufacture and Distribution of Gas," 8 p.m. Builders' Clerks' Benevolent Institution.—Twenty-third annual dinner, King's Hall, Holborn Restaurant. 6.30 p.m.

WEDNESDAY, APRIL 17.

British Archaeological Association.—(1) Mr. C. E. Keyser, M.A., F.S.A., on "Sculptured Tympana of English Norman Doorways," with limelight illustrations. (2) "Notes on interments at Blessea, North Lancashire," by Mr. T. Cann Hughes, M.A., F.S.A. 8 p.m. Sanitary Institute.—Messrs. Henry R. Kenwood, M.B., and W. Butler, M.B., on "Seawater Purification and Standards of Purity," 8 p.m. Builders' Foremen and Clerks of Works Institution.—Quarterly meeting of the members. 8 p.m. Edinburgh Architectural Association.—Sir John Sibbald on "Lunatic Asylum Design from a Medical Point of View," illustrated by limelight views. 8 p.m.

THURSDAY, APRIL 18.

Royal Institution.—Mr. Roger Fry on "Naturalism in Italian Painting," 8 p.m. Institution of Electrical Engineers (at the Institution of Civil Engineers).—(1) Replies of Mr. H. Ravenshaw and Mr. S. F. Walker to the discussion on their papers read at the last meeting. (2) "Test Room Methods of Alternate Current Measurements," by Mr. A. Campbell. (3) "Note on the Use of the Differential Galvanometer," by Mr. C. W. S. Crawley. (4) Announcement of the Council's nominations for the Council 1901-2. 8 p.m.

FRIDAY, APRIL 19.

Architectural Association.—Mr. M. A. Green on "The Eighteenth Century Architecture of Bath" (illustrated by lantern views). 7.30 p.m. Institution of Mechanical Engineers.—Ordinary General Meeting. Presidential Address by Mr. William H. Maw. 8 p.m. Royal Institution.—Professor J. J. Thomson, M.A., on "The Existence of Bodies Smaller than Atoms," 9 p.m. Institution of Civil Engineers.—Students' meeting. Mr. E. V. Clark, B.Sc., on "The Theory of Cast-Iron Beams," 8 p.m.

SATURDAY, APRIL 20.

Architectural Association.—Visit to the International Building Trades Exhibition, Agricultural Hall. 3 p.m. Edinburgh Architectural Association.—Visit to Dalrymple House and Church and Chapter House at Restalrig.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales including March 26, 27, and 28, Drivers, Jonas, & Co. (at Monmouth), Monmouth, Old Herford rd., &c., three freehold cottages and 1 a. 2 r. 24 p., &c., 1,300; Llantriheddi, an enclosure, 2 a. 3 r. 27 p., f., 1,300; Old Dixton rd., five enclosures, 19 a. 0 r. 24 p., f., 1,565; Osbaston rd., an enclosure, 1 a. 0 r. 26 p., f., 200; Monmouth Electric Lighting Works, f.g.r. 80d., reversion in 35 yrs., 2,100; Rockfield rd., four enclosures, 12 a. 3 r. 36 p., f., 790; Drybridge, Barber's Meadow, 4 a. 2 r. 7 p., f., 725; Dixton Hadcock, Mon.—Wyeasham House and 3 a. 0 r. 33 p., f., 7,950; A freehold cottage and 1 a. 2 r. 10 p., f., 165; Freehold building site, 2 a. 1 r. 27 p., f., 360; Hill House and 16 a. 2 r. 5 p., f., 5,100; Dixton Farm, 15 a. 0 r. 26 p., f., 3,800; Several building plots, 2 a. 3 r. 9 p., f., 437; Monmouth Gas and Water Works, f.g.r. 27d., reversion in 27 yrs., 2,100; Monmouth Sawmills, area 4 a. 1 r. 6 p., f., 2,750.

Table listing various property sales and transactions including Freehold building land, Butterby's Cottage and 3 a. 0 r. 9 p., f., 1,940; Four enclosures, area 3 a. 1 r. 14 p., f., 550; Mayhill Wharf, area 3 a. 3 r. 30 p., f., 550; Enclosure of building land, 11 a. 2 r. 1 p., f., 550; Enclosure of grass land, 0 a. 2 r. 32 p., f., 130; Wyeside Cottage and 0 a. 2 r. 4 p., f., 135; Two building sites, g.a. 0 r. 24 p., f., 500; A freehold nursery, 1 a. 0 r. 39 p., f., 160; A freehold building site, 5 a. 3 r. 26 p., f., 600; Monmouth.—The Garth Estate, 150 a. 3 r. 14 p., f., 4,600; Rockfield rd., an enclosure, 3 a. 0 r. 10 p., f., 165; Wonastow rd., two farms, 41 a. 0 r. 16 p., f., 1,950; Wonastow rd., two enclosures, 1 a. 3 r. 38 p., f., 310; Gibraltar Cottage, St. Dial's Wood, and 51 a. 3 r. 12 p., f., 2,800; Cinderhill-st., a cottage and 21 a. 2 r. 36 p., f., 1,875; 49, 51, and 53, Cinderhill-st., f., 135; Cinderhill-st., freehold business premises, 220; St. Mary-st., f.g.r. 12d., reversion in 41 yrs., 310; 5 and 7, St. Mary-st., f., 200; 1 and 3, Church-st., with whitesmith's shop, f., 147; 2 and 4, Agincourt-st., f., 430; 21, Minnow-st., f., 340; 11, 12, and 13, Agincourt-st., f., 2,600; Castle Hill, freehold house and warehouse, 490; Dixton Hadcock, Mon.—The Ymyn Summer House and 9 a. 1 r. 22 p., f., 125; Seven freehold cottages and 13 a. 3 r. 1 p., 247; Forest cottages and 4 a. 2 r. 36 p., f., 133; March 28.—By HENRY HENDRICKS (at Birmingham). Edgbaston, Warwick.—3 and 4, George rd., u.t. 703; 17, 17 1/2, 57, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
School Buildings	Berwick-on-Tweed School Board	Not stated	No date

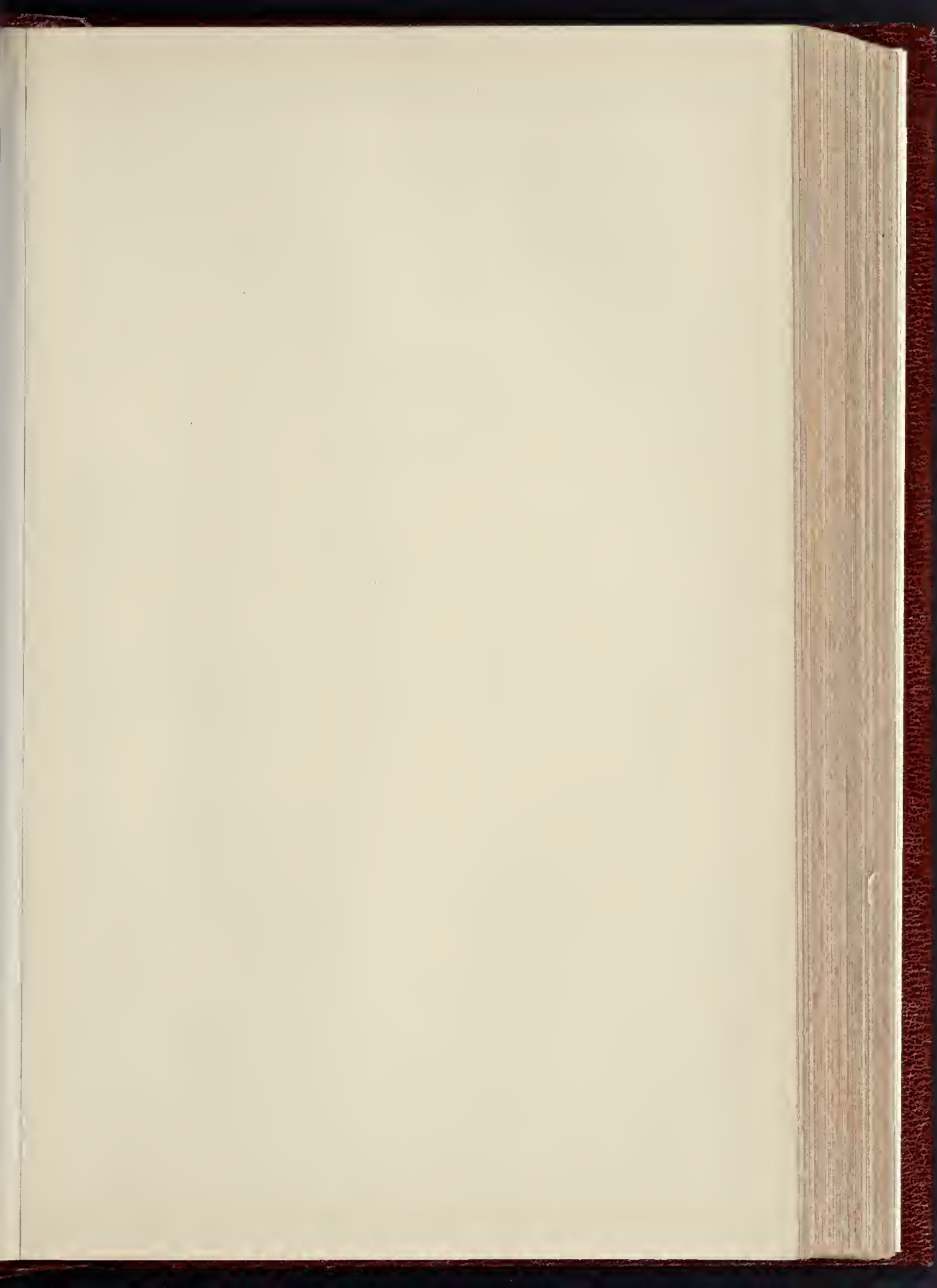
CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Farmhouse, Silcroft, Cumberland		J. W. Grundy & Son, Architects, Uverston	April 15
Six Houses, Newtown, Wrexham		J. Edwards, 45, Princess-street, Wrexham	do.
Storage Reservoir, Carronbridge, N.B.		Warren & Stuart, Civil Engineers, 115, Wellington-st., Glasgow	do.
Road Metal	Seiby (Yorks)	The Rectory, Hervey Hill, Kilsre	do.
Building Work, near Kilsre, Ireland		City Engineer, Municipal Buildings, Leeds	do.
Additions to Market, Kirkgate	Leeds Corporation	W. Burton, Surveyor, Billingham, Stockton-on-Tees	do.
Road Materials	Leeds Corporation	H. Dickinson, 1, Whitehall-road, Leeds	do.
Cast-iron Pipes, &c.	J. Lancaster & Co., Ltd.	C. Telford Evans, Architect, 8, Queen-street, Cardiff	do.
100 Houses, Aberlillery		D. Robertson, Architect, 39, Shandwick-place, Edinburgh	do.
Church, Burntisland, N.B.		S. F. Hines, Architect, 21, South-mall, Cork	do.
Additions to Convent, Kinsale, Ireland	Messrs. J. Lancaster & Co., Ltd.	C. T. Evans, Architect, 8, Queen-street, Cardiff	do.
Sewers, Drains, &c., Aberlillery, Mon	Milom Masonic Buildings Co., Ltd.	Marriott & Sons, Civil Engineers, Church-st., Chambers, Dewsbury	do.
Lodge Buildings	Paddington Borough Council	Surveyor's Office, Town Hall, Harrow-road	do.
House, West Park-street, Dewsbury		do.	do.
*Jarrah Wood Block		do.	do.
*Portland Cement, &c.		do.	do.
*Pitch		do.	do.
Paving Works, Seaford, Sussex	Trustees of T. Crook	B. A. Miller, Surveyor, 8, Churton-place, Seaford	April 16
Iron Castings, &c., Dublin	Dublin, Wicklow, & Wexford Ry. Co.	M. F. Keogh, Westland-row, Dublin	do.
Tar-paving Materials	Carshalton U.D.C.	W. W. Gair, Civil Engineer, High-street, Carshalton	do.
Additions to Hospital	Crewe Corporation	O. Shore, Municipal Offices, Crewe	do.
Sewerage Works, &c.	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	do.
Bridge from Newdigate to Knapier	Dorking U.D.C.	W. Rapley, Surveyor, Holmwood, near Dorking	do.
Sewage Farm Extension Works, Minworth	Birmingham Corporation	J. D. Watson, Engineer, Tyburn, near Birmingham	do.
Stones Bridge, near Shipley Glen, Baldon Moor, Yorks		Young & Brown, 7, Southampton-street, W.C.	April 17
Additions to Workhouse, &c.	West Ashford (Kent) Union Gdns.	Surveyor, Town Hall, Oxford	do.
Additions, &c., to Mortuary	Oxford Corporation	T. Hewson, Civil Engineer, Municipal Buildings, Leeds	do.
Sewerage Works, &c.	Leeds Corporation	C. R. Pease, Engineer, Town Hall, Todmorden	do.
River Diversion Works, Wall, &c.	Todmorden Corporation	H. T. Fowler, Architect, Ransdell-square, Barrow	do.
School, Vickerstown	Barrow-in-Furness School Board	C. C. Doig, Architect, Elgin	April 18
Additions to Distillery, Ballinallach, N.B.	Fenton (Staffs) U.D.C.	S. A. Goodall, Surveyor, Town Hall, Fenton	do.
Road Metal	Salford Corporation	L. C. Evans, Town Hall, Salford	do.
Retort House Floors, &c., Albion-street	Ealing U.D.C.	Engineer, Public Offices, Ealing	do.
*Making up Roads	Metropolitan Asylums Board	Offices, Embankment, E.C.	do.
*Repair of Floors	Metropolitan Asylums Board	W. F. Young, Surveyor, Town Hall, Hoyland, near Barnsley	April 19
Slag Road Metal (3,000 tons)	Hoyland Nether U.D.C.	J. Barron, Civil Engineer, 1, Bon Accord-street, Aberdeen	do.
Cottage Homes, School, &c., Culcheth	Salford Union Guardians	Engineer, 5, Dewar-place, Edinburgh	do.
Drainage Works	Edinburgh Corporation	J. L. Smith & Davies, Architects, 50, High-street, Merthyr	April 20
Cast-iron Pipes, &c.	Messrs. A. Buchanan & Co.	Care & Ross, Architects, 60, Dnke-street, Chelmsford	do.
Additions to Bute Arms, Merthyr	Creasing (Essex) School Board	T. E. Fellows, Civil Engineer, Town Hall, Willehall	April 22
Schools	Whitchurch (Hants) U.D.C.	City Engineer, Municipal-buildings, Leeds	do.
Flints, &c.	Willehall (Staffs) U.D.C.	Engineer, Paddington Station	do.
Extension of Fire Station	Leeds Corporation	L. J. Vell, Civil Engineer, Council Offices, Gode	do.
Additions to Police Station, Holbeck	West London Extension Railway	E. Laley, Engineer, 1, Market-street, Watford	April 23
*Brickwork Abutments, &c.	Goole U.D.C.	Offices, Embankment, E.C.	do.
Paving Works, &c.	Watford E.D.C.	H. C. Scapling, Architect, Court-chambers, Grimsby	April 25
Sewerage Works, &c.	Metropolitan Asylums Board	F. Redman, Engineer, 34, Greenham-house, Old Broad-st.	April 26
*Repairs, &c.	Great Grimsby School Board	Hinnell & Murphy, Civil Engineers, 41, Corporation-st., Manchester	do.
Waterworks Extension	Goole U.D.C.	Storey's Gate, S.W.	April 30
Engine House, Water Tower, &c., Coates	Crencaster R.D.C.	Town Hall, Ilfracombe	do.
Sewage Works, West Timperley	Atrincham U.D.C.	W. Wright, Warwick-bridge, Carlisle	May 14
Electric Lighting Plant	Middlebrough Corporation	E. J. Price, Architect, 24, Low-pavement, Nottingham	No date
Foundations	Office of Works	G. Palmer & Son, Haverfordwest	do.
*Sewers, &c.	Ilfracombe U.D.C.	Chief Clerk, Town Hall, Manchester	do.
House, Head's Nook, Carlisle	Manchester Corporation	W. H. Hopkinson, Civil Engineer, Town Hall	do.
Two Shops, Gedling		E. H. L. Barker, Architect, Hereford Offices, Rugby	do.
Four Cottages, Little Haven, Pembrokeshire		W. H. Baxter, Limited, Engineers, Gellord-road, Leeds	do.
Cris Sets			do.
Paving Works, Ebenezer-square, Kighley			do.
Mission and Schools, Rngby			do.
Additions to Foundary, Leeds			do.

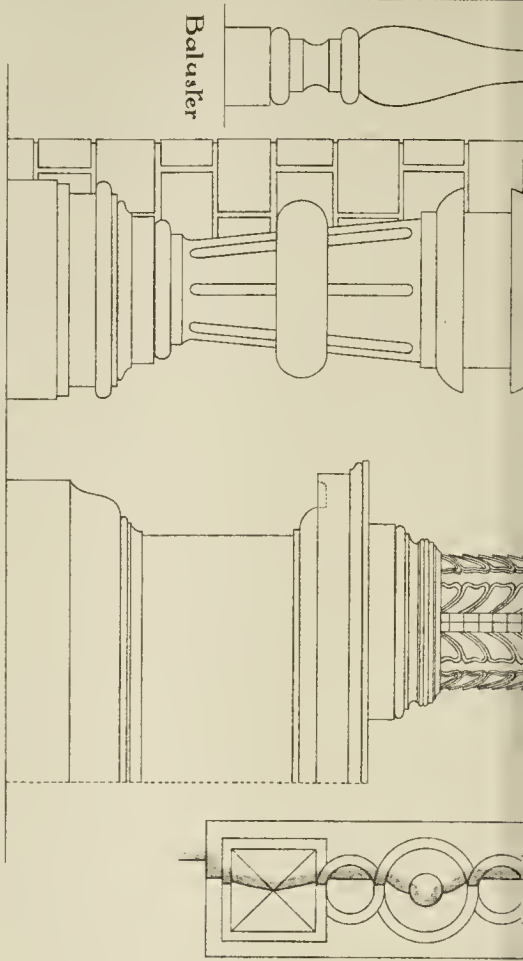
PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Inspector	S. Stoneham R.D.C.	2l. 8s. per week	April 15
*Assistant	Ilalington Borough Council	90l. per annum	April 18
*Clerk of Works	Stroud U.D.C.	3l. 6s. per week	do.
*Inspector of Nuisances		100l. per annum	April 23

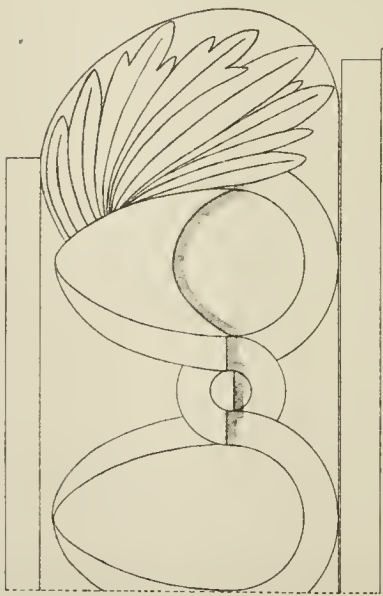
Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv, vi, viii, x, & xxiii. Public Appointments, pp. xx, & xxiii.



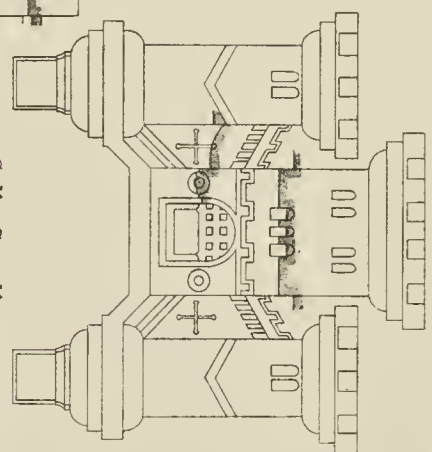
Baluster



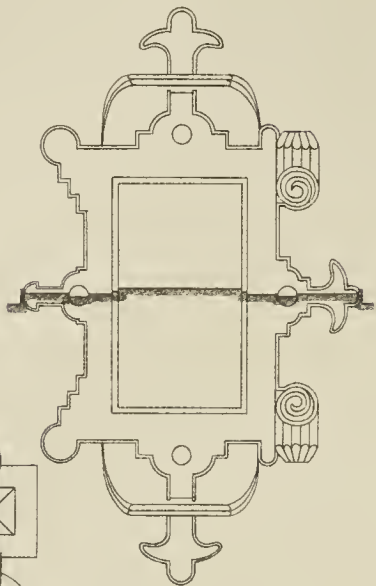
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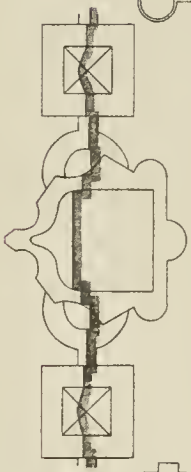
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City Crest



Raised Panel

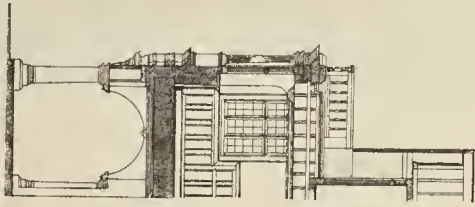


Raised Panels

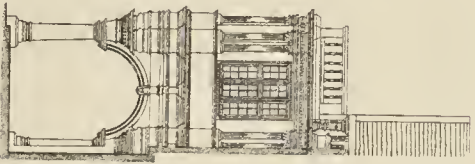
Measured & drawn by Mr. Jas. H. Shearer.

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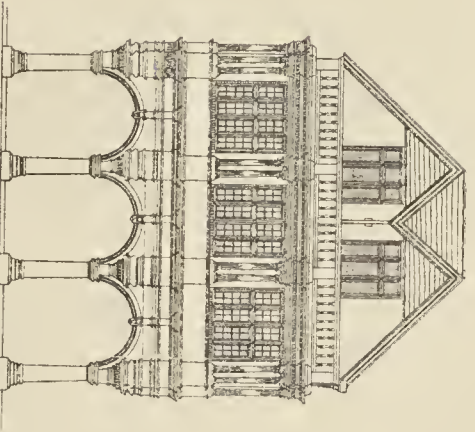
~ The Guildhall ~ ~ Exeter ~



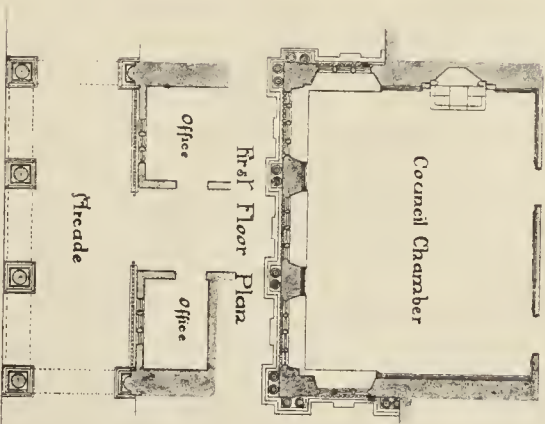
Section



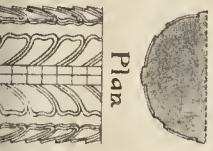
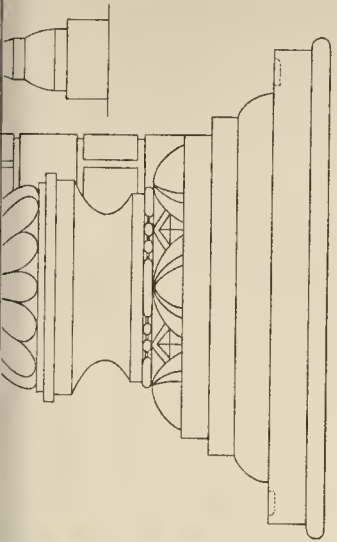
End Elevation



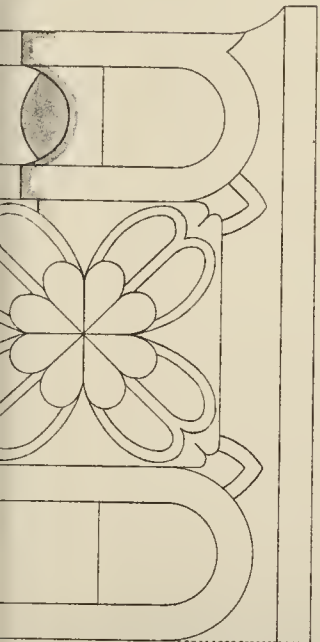
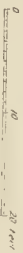
Front Elevation



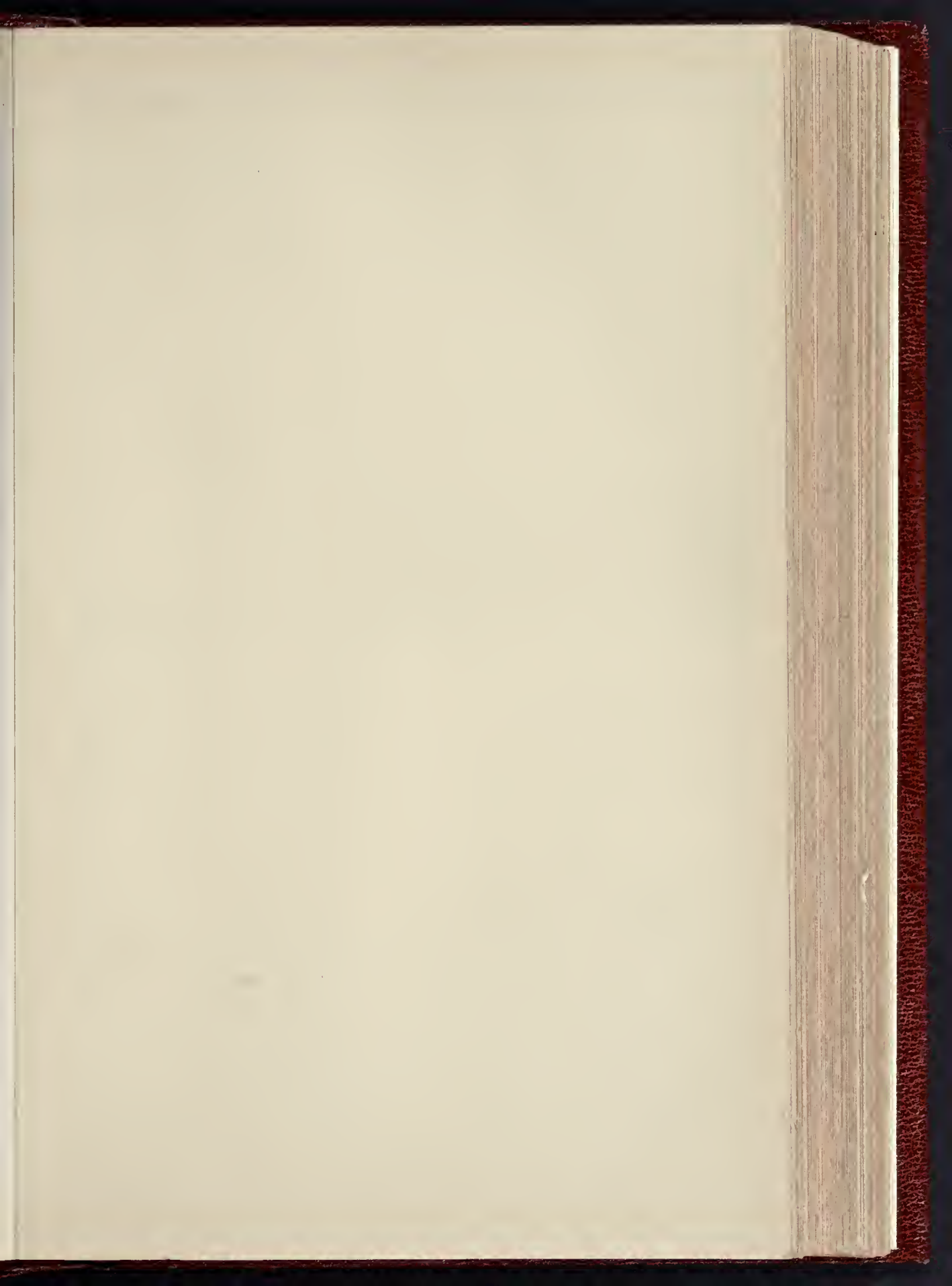
Ground Plan



Plan









1. SILVER TEAPOT, HOT-WATER & CREAM JUGS (MR. ARTHUR S. DIXON)



2. JEWEL CASE (MR. ARTHUR S. DIXON)



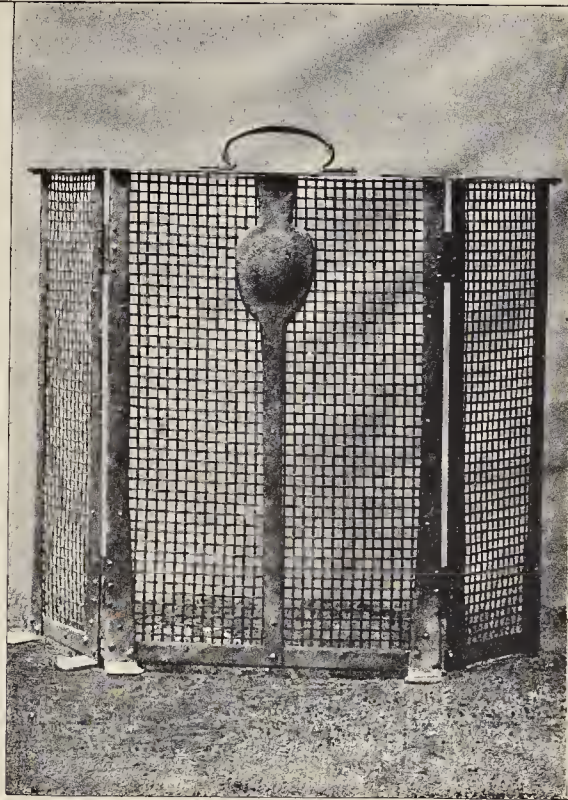
4. KETTLE (MR. ARTHUR S. DIXON)



5. BRASS ELECTROLIER (BIRMINGHAM GUILD)



SO (Mr. J. PAUL COOPER).



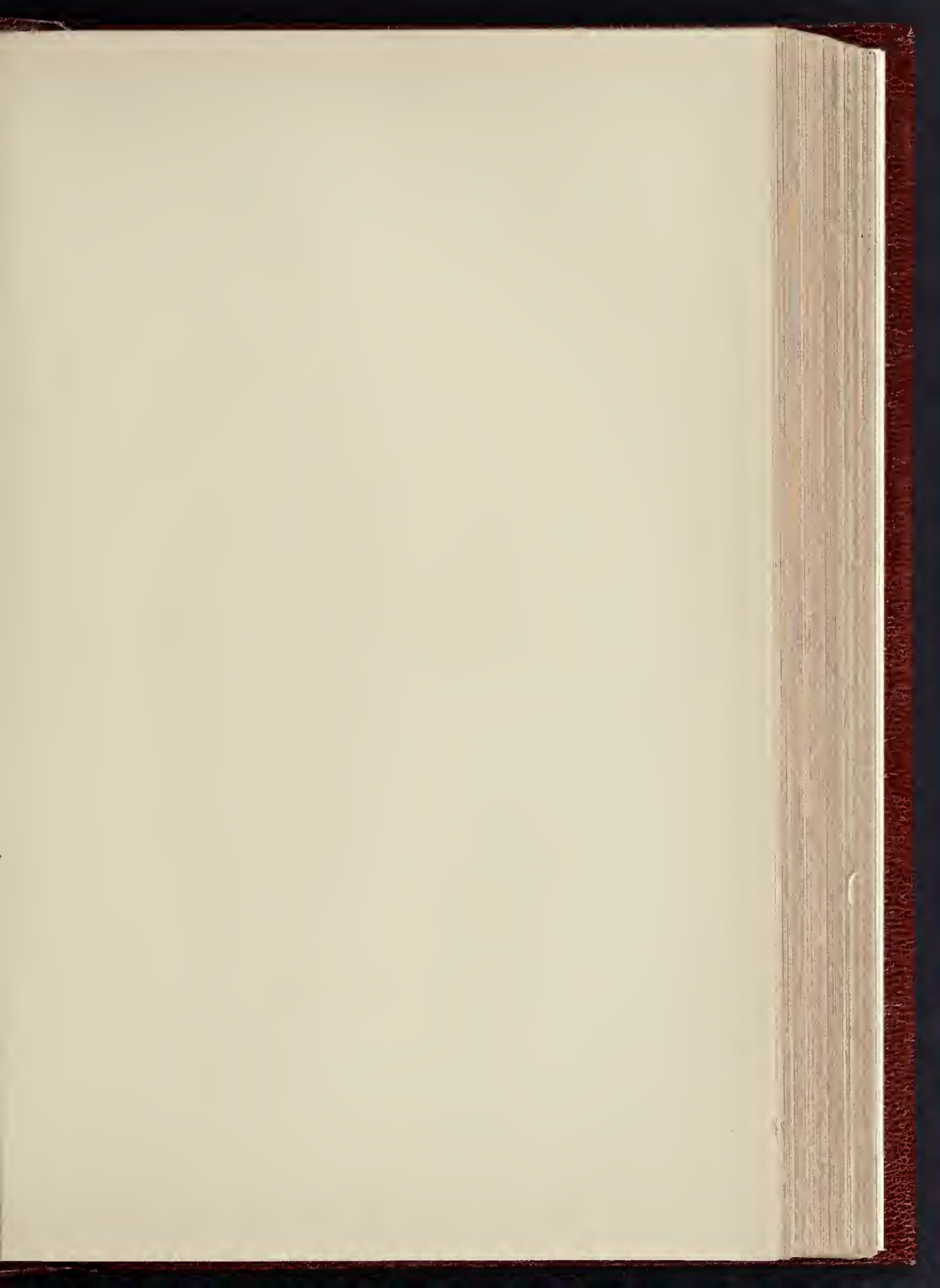
3. FIRE-SCREEN (Mr. PERCY S. WORTHINGTON)



6. CHINA VASES AND CANDLESTICKS (THE MASSES LUGAS)

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June 1901

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PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for Bricks, Hard Stocks, Rough Stocks, Grizzles, Facing Stocks, Shippers, Flettons, Red Wire Cuts, Best Farham Red, Best Red pressed, Raubach Facing, Best Blue Pressed, Stourbridge, Do., Bullnose, Best Stourbridge, Fire Bricks, Glazed Bricks, Best White and Ivory Glazed, Stretchers, Headers, Quoins, Bullnose and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Plays, Chamfered, Squints, Best Dipped Salt Glazed Stretchers and Headers, Quoins, Bullnose and Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Plays, Chamfered, Squints, Seconds Quality White and Dipped Salt Glazed, Thames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Lias Lime, Nails, Grey Stone Lime, Stourbridge Fire-clay in sacks.

STONE.

Table listing prices for Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Grinshell, Brown Portland in blocks, Darley Dale in blocks, Red Corshell, Red Mansfield, Hard York in blocks, Hard York 6 in. sawn both sides, 6 in. Rubbed Ditto, 3 in. sawn both sides, 3 in. self-faced Ditto.

SLATES.

Table listing prices for 20x10 best blue Bangor, 16x8 best blue Portmadoc, 20x10 best blue Portmadoc, 16x8 best blue Portmadoc, 20x10 best Eureka unfading green, 16x8 Permanent green, 16x8.

TILES.

Table listing prices for Best plain red roofing tiles, Hip and valley tiles, Best Broseley tiles, Hip and valley tiles, Best Ruanon Red brown or brindled Do., Do. ornamental Do., Hip tiles, Valley tiles, Best Red or Mottled Staffs, fordshire Do., Hip tiles, Valley tiles.

WOOD.

Table listing prices for Deals: best 3 in. by 11 in. and 4 in. by 9 in., Deals: best 3 by 9, Battens: best 2 1/2 in. by 11 in. and 3 in. by 7 in., Battens: best 2 1/2 by 6 and 3 by 6, Deals: seconds, Battens: seconds, Fir timber: Best middling Danzig or Memel (average specification), Seconds, Small timber, Swedish balks, Pitch pine timber.

PRICES CURRENT (Continued).

WOOD.

Table listing prices for JOINERS' WOOD, White Sea: First yellow deals, 3 in. by 11 in., Battens: 2 1/2 in. and 3 in. by 7 in., Second yellow deals, 3 in. by 11 in., Third yellow deals, 3 in. by 11 in., Battens: 2 1/2 in. and 3 in. by 7 in., Petersburg: first yellow deals, 3 in. by 11 in., Do., Battens, Second yellow deals, 3 in. by 11 in., Do., Battens, White Sea and Petersburg: First white deals, 3 in. by 11 in., Second white deals, 3 in. by 11 in., Third white deals, 3 in. by 11 in., Pitch pine: deals, Under 2 in. thick extra, Yellow Pine: First, regular sizes, Odds and Ends, Seconds, regular sizes, Yellow Pine Odds and Ends, Kauri Pine: Planks, per ft. cube, Danzig and Stettin Oak Logs—Large, per ft. cube, Small, Wainscot Oak Logs, per ft. cube, Dry Wainscot Oak, per ft. sup. as inch, do., do., Dry Mahogany: Honduras, Labasco, per ft. sup. as inch, Selected, Figury, per ft. sup. as inch, Dry Walnut, American, per ft. sup. as inch, Teak, per load, American Whitewood Planks—Per ft. cube.

JOISTS, GIRDERS, &c.

Table listing prices for Rolled Steel Joists, ordinary sections, Compound Girders, Angles, Tees and Channels, ordinary sections, Fitch Plates, Cast Iron Columns and standards, including ordinary patterns.

METALS.

Table listing prices for IRON: Common Bars, Staffordshire Crow Bars, good merchant quality, Staffordshire "Marked Bars", Mild Steel Bars, Hoop Iron, basis price, galvanized, (* And upwards, according to size and gauge.) Sheet Iron, Black—Ordinary sizes to 20 g., Compound sizes, 6 ft. by 2 ft. to 3 ft. to 20 g., Sheet Iron, Galvanized, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g., Galvanized Corrugated Sheets—Ordinary sizes, 6 ft. to 8 ft. to 20 g., Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker, Cut nails, 3 in. to 6 in., (Under 3 in. usual trade extras.) LEAD—Sheet, English, 3 lbs. & up, Pipe in coils, Soil Pipe. ZINC—Sheet—Wattle Montague, Silesian. COPPER—Strong Sheet, Thin. BRASS—Strong Sheet, Thin. TIN—English Ingots. SOLDIER—Plumbers'. Tinner's. Blowpipe.

PRICES CURRENT (Continued).

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for 15 oz. thirds, fourths, 21 oz. thirds, fourths, 26 oz. thirds, fourths, 32 oz. thirds, fourths, Fluted sheet, 15 oz., Hartley's Rolled Plate.

OILS, &c.

Table listing prices for Raw Linseed Oil in pipes, Best Japan Copal Varnish for inside work, Billed in pipes, Turpentine, in barrels, Genuine Ground English White Lead, Red Lead, Dry, Best Linseed Oil Putty, Stockholm Tar.

VARNISHES, &c.

Table listing prices for Fine Elastic Copal Varnish for outside work, Best Elastic Carriage Varnish for outside work, Best Hard Oak Varnish for inside work, Best Extra Hard Church Oak Varnish for inside work, Fine Hard Copal Varnish for inside work, Best Hard Copal Varnish for inside work, Best Hard Carriage Varnish for inside work, Extra Pale Paper Varnish, Best Japan Gold Size, Best Black Japan, Oak and Mahogany Stain, Brunswick Black, Berlin Black, Knotting, Best French and Brush Polish.

TO CORRESPONDENTS.

J. F.—W. & G. N.—J. H. C. (Amounts should have been stated). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.] * Denotes accepted. † Denotes provisionally accepted. ALCESTER.—For alterations, &c., to bridge, over the river Aine, Little Aine, Aston Cantlow, for the Rural District Council. Mr. Chas. Gander, Surveyor, Council Offices, Alcester:—S. Keyte.....£211 0 | J. Bromley.....£144 10 | Surveyor's estimate, £150. CARDIFF.—For the erection of chimney shaft, &c., Roath, for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff. Quantities by the engineer:—E. H. P. Neal.....£4,340 0 | Custodian of the Works & John 2,972 18 7 | Key Co.....£1,600 0 | Knox & Wells 1,770 0 | Clark & Co., Chubb & Co.....1,732 0 0 | Cardiff.....1,563 1 5 | Symonds & Co. 1,626 12 1

COLNE (Lancs.).—For the erection of electric lighting stands, &c., Philips-lane, for the Corporation. Mr. T. H. Hartley, Borough Surveyor, Town Hall, Colne. Quantities by Borough Surveyor:—Masonry, &c. J. & D. Lancaster.....£3,172 9 10 | W. Townson.....£2,428 7 0 | Bottomley & Co. 2,501 19 6 | J. Hawley, Colne.....2,363 9 3 | P. Robinson.....2,445 9 5. Carpentry and Joinery. Latham & Rushton.....£389 5 6 | Ruddrough & Co. £378 0 0 | Caddie Bros.....386 3 7 | Jas. Roberts.....374 0 0 | Jno. Wiseman.....330 0 0 | Horsfield & Jackson, Colne.....351 9 9. EASTLEIGH (Hants).—For the erection of boundary wall, &c., at the cemetery, for the Urban District Council. Mr. W. Stringfellow, C.E., Council Offices, Eastleigh:—W. H. White, Head.....£478 4 8 | ternie Park, near Southampton.....£35 7 6 | F. Osmani.....421 0 0 | J. Treherne.....392 3 6

TUNBRIDGE WELLS.—For sewerage and making up the undermentioned roads, for the Corporation:—

	Nelson-road.	Dorset-road.	Napier-road. Porton, 36 ft. Wide.	Napier-road. Porton, 30 ft. Wide.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Arnold & Sons.....	1,103 10 7	1,283 2 9	973 2 0	667 1 4	4,026 16 8
W. H. Wheeler.....	1,010 2 9	1,110 19 8	834 11 6	595 0 2	3,550 14 1
L. Charlton.....	976 6 0	1,044 6 10	795 9 4	557 18 10	3,394 1 0
Laurence & Thacker.....	886 14 1	955 12 10	767 10 5	589 8 11	3,200 6 3
J. Jarvis.....	888 9 4	1,002 6 5	773 9 1	593 9 0	3,167 13 10*

The following tenders for sewerage and making-up Albion-road were received:
 Arnold & Sons..... £602 14 11 | J. Jarvis..... £445 7 4
 W. H. Wheeler..... 477 3 3 | Laurence & Thacker*..... 404 6 2

HIGH WYCOMBE.—For erection of pair of houses, for Messrs. Birch & Gibbs, Amersham Hill. Mr. Arthur Vernon, architect, 29, Cocks-pur-street, London, S.W., and High Wycombe:—
 Harris..... £1,944 0 0 | Gibson..... £1,625 0 0
 Furniss..... 1,850 12 6 | Lee..... 1,475 4 0
 Nash..... 1,693 0 0 | Hunt*..... 1,317 0 0
 Flint..... 1,167 0 0

HIGH WYCOMBE.—Additions to Holmby, for Mr. John Rutty. Mr. Arthur Vernon, architect, 29, Cocks-pur-street, London, S.W., and High Wycombe:—
 Gibson..... £461 | Hunt..... £445

HIGH WYCOMBE.—For new roads on Mr. Terry's estate. Mr. Arthur Vernon, architect, 29, Cocks-pur-street, London, S.W., and High Wycombe:—
 Siddons & Freeman..... £4,319 | Lee*..... £3,210
 Hill..... 3,342

LONDONDERRY.—For re-seating, &c., Presbyterian Church, Donaghedy, for the Committee. Mr. M. A. Robinson, C.E., Richmond-street, Londonderry:—
 R. Colhoun..... £770 | Donnell & Co., Stra-
 McKee & Sons..... 759 | bane, Co. Tyrone*.. £570
 Jas. McCloy..... 725 | W. G. Mooney..... 561
 D. McCaffrey..... 703

NORWICH.—For the erection of "Scott Memorial Church," Thorpe-road, for the trustees. Mr. A. F. Scott, F.S.I., architect:—
 S. H. Birch..... £4,098 17 6 | J. Evans..... £4,250 0 0
 Daws & Son.. 4,489 0 0 | T. Gill..... 4,249 0 0
 J. W. Collins 4,450 0 0 | Scarles Bros.....
 J. S. Smith.. 4,323 0 0 | Norwich*.. 3,974 0 0
 G. E. Hawes 4,258 0 0
 [Architect's estimate £3,996.]

PURSTON.—For three houses at Purston, near Pontefract, for Messrs. D. F. & S. Littlewood. Messrs. Gar-side & Pennington, architects, Pontefract. Quantities by architects:—
 Bricklaying and Joinery.—Geo. Clements,
 Featherstone, near Pontefract..... £478 0 0
 Plumbing and Glazing.—J. S. Halking,
 Featherstone..... 77 10 6
 Slating.—Geo. Spurr, Pontefract..... 49 9 0
 Plastering.—T. W. Senior, Pontefract..... 73 0 0
 Painting.—Burton & Son, Pontefract..... 10 0 0
 £663 11 6

RYDE.—For house, shop, and bakehouse, Oakfield, Ryde, for Mr. A. Cook. Mr. John I. Barton, architect:—
 Jenkins..... £263 10 | Hayden..... £747 10
 Newnham..... 800 0 | Barton..... 73 0
 Whitewood..... 780 0 | Wheeler Bros.*..... 680 0

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ST. HELENS (Isle of Wight).—For stores and sail loft, St. Helens, Isle of Wight, for Messrs. Westmacott, Stewart, & Co., Limited. Mr. John I. Barton, architect, Ryde:—
 Barton..... £1,189 0 0 | Wheelwright Bros. £998 10
 Hayden..... 999 0 0 | C. Love, Bembridge* 910 0

SHEETON.—For additions to flour mill, Pyenestreet, Shepton, for Messrs. Lease & Son. Messrs. R. Scrivener & Sons, architects, Hanley, Staffs:—
 T. R. Yoxall..... £1,033 | Ball & Shepton..... £827
 A. Ward..... 1,005 | Leonard..... 825
 G. Ellis..... 999 | M. Ward..... 815
 S. J. Wilton..... 919 | Cornes & Son,
 J. Godwin..... 851 | Hanley*..... 775

STOCKPORT.—For the erection of minister's house, Hazel Grove, for the Wesleyan Trustees. Mr. C. T. Adshard, architect, Liverpool. Quantities by architect:—
 W. L. Adkinson..... £980 0 | George Oldham,
 J. H. Wild..... 960 10 | Stockport..... £387 0
 Samuel Daniels... 915 0

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The Builder.

VOL. LXXX.—No. 3927

APRIL 20, 1901.

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Easter Sepulchre, Hawton-by-Newark, Northants.—Drawn by Mr. Hervey Rutherford.....	Double-Page Ink Photo.

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Some Cities of Modern Italy—Brescia.



BRESZIA is a small, clean, flourishing town. Its industries and activities are chiefly connected with the ironworks in the neighbouring valleys, but to all appearance it

seems the market town of a well-to-do agricultural district rather than the centre of smelting works and forges. The city possesses its old walls and fortifications, on which the Lion of St. Mark still stands sentinel—memorials of almost the farthest western possession of the Serene Republic of Venice. But outside these walls a considerable suburb of modern villas, with their gardens, has sprung up within the last few years, and the builders are busy now with many more new houses. This district has a pleasing, homely look; the houses are simple, substantial buildings, without the vulgar Parisian character of the modern districts of Milan, and yet at the same time of a very modern design. In Brescia the plastered front, with pseudo-Classical details, seems out of fashion; a kind of adaptation of round arch brick Romanesque prevails, and as there is considerable individuality of treatment, with simplicity and absence of uninteresting ornament, the result is satisfactory.

The chief architectural interest of Brescia lies in the projected and partly-executed re-instatements of some of the ancient monuments of the town. Here also the Ufficio Regionale is doing a great deal of work. The large Broletto, or medieval Palazzo della Giustizia, with its prison still in use, is undergoing careful treatment. Sketches of the old building of many years ago will be found in Street's book on the "Brick and Marble of North Italy." Street would probably have rejoiced to see the careful manner in which the old windows and other details are being relieved of the clumsy wallings-up and plaster coverings which have perhaps to some extent served

to protect them for modern use. The style of the building is Early Lombard of the twelfth or thirteenth centuries, with a chapel forming part of the block, which may be rather later. When the present work is finished, which will leave the building in its time-stained condition without any attempt to make it look new and fresh, the result will be most interesting and picturesque.

A still more important work at present being studied by the Ufficio Regionale is the re-instatement of the enormous chamber or "Salone" of the Municipio. This exceedingly beautiful building of the Early Renaissance is perhaps not quite so well known as it deserves to be. It is certainly one of the very finest examples of the style, and the refinement of detail, the sense of proportion, and the ingenious mode of construction are equalled in few buildings, ancient or modern. Unfortunately the upper portion, consisting of an enormous hall for the public meetings of the citizens, has been abandoned to neglect since the sixteenth century. The building was originally covered with one of the singular wooden roofs covered with lead, of a curved section, similar to those of Padua, Vicenza, and some other towns of the Venetian district. These very remarkable constructions are evidently an old Venetian speciality, and belong more to the mediæval than the Renaissance period. Such a mode of forming a roof is quite unknown elsewhere, and would certainly be condemned in modern times as both contrary to scientific principles and common sense. The great hall at Vicenza, on to which Palladio added his very ingenious arcades, is 21 mètres wide; the Sala della Ragione at Padua is wider, but this example at Brescia seems to be the widest of all, with no less than 24 mètres 70 cms. total span for the roof. In every case the inside appearance is that of a ship turned upside down, with the ribs exposed, and nothing in the shape of trusses or other internal framing to support them. The ribs are merely held in position by numerous horizontal iron ties at different levels in the height. The ribs are, of course, formed of lengths of timber bolted together in the usual way of forming a wooden curve,

but, instead of being trussed, these enormous curved beams appear to support themselves with the mere addition of a strongly tied-in foothold on the walls. Incredible as such a mode of construction appears, there are numerous examples of it all over the ancient Venetian provinces, and many of them date at least from the thirteenth century. In the case of Brescia, however, the enormous roof of this description which is said once to have existed over the "Salone" of the Municipio was destroyed by fire in 1575, after only twenty years' existence. The roof was never re-erected on the same lines. Architectural taste changed very considerably before the project of restoring it could be carried into effect, and then in place of the graceful lines of the curved lead roof crowning the Renaissance edifice, a very ugly barocco base to what was perhaps intended for a dome was substituted. But the dome also was never carried out, and the whole area was covered over with a common roof of tiles supported on rough wooden partitions which have formed a number of rooms in place of the "Salone." In this condition the edifice has remained for more than a century, practically a ruin, but structurally well preserved.

A desire has lately been manifested on the part of the public, as well as by the Government authorities, to recover this splendid monument from the neglected state into which it has fallen; but the question of re-constructing the roof is a serious one, both on account of expense and as a structural problem. The Ufficio Regionale appears to have no intention of adopting the original method of construction for the purpose, but instead suggests the use of iron in the ordinary way of the present day, but adhering closely to the original outline and proportions of the lead covering. The clumsy barocco additions on the top of the building must, of course, be removed. In this case a departure from the guiding rule of the Ufficio may, perhaps, be tolerated. The Ufficio has been formed for the purpose of preserving everything of whatever age it may be, but in the present case the perfectly beautiful Renaissance building is too

grossly disfigured by this clumsy, unfinished addition, which is not only useless, but impossible to retain if the original roof is reinstated. The architect (probably the same who built the "Duomo Nuovo" of Brescia in the seventeenth century) had very little idea of harmonising his work with that of his predecessors; on the contrary, his addition is totally out of scale and keeping with the substructure. Under the circumstances no reason can be urged for the retention of this portion on artistic or archaeological grounds. The restoration of the original roof with iron construction is, however, a somewhat different matter. The restoration of the roof is chiefly for the outside appearance of the building, and on the inside there must, of course, be a ceiling, otherwise the interior will present too much the appearance of a railway shed, and also be very subject to the effects of temperature. There are also other questions which arise in such a case: the weight on the walls of the iron construction will probably be far greater than the older system involved, and the permanence of modern iron roofs has not been tested in this way, or to the extent of the old buildings which have supported the lapse of six centuries. It is a pity the singular system of Venetian construction of the fourteenth century cannot be revived in the present case. It would be curious to see such a method, so contrary to modern ideas, employed in defiance of all modern principles of construction. But the Italians of the present day are not quite so venturesome as their forefathers, and so we must be content with a mere outside completion of the building, which will certainly be a great advantage to it and to the city.

The very beautiful little building called "La Madonna dei Miracoli" is in a perfect state of preservation and carefully guarded by the Ufficio Regionale. A view of the portico appeared in the *Builder* at the end of 1898, but it hardly represents the full beauties of this design, which consist not only in the exquisite detail, but also in the ensemble of the church. The portico represented in our view is surmounted by a most picturesque and original gable, equal in that respect to anything of the kind on a Belgian canal. The whole façade is a most interesting study of Venetian Renaissance, and reminds one very much of the little church with the same dedication at Venice.

THE BUILDING TRADES EXHIBITION.

THE exhibition at the Agricultural Hall appears to be one of the fullest and best that has been held there; and if the exhibits themselves were not quite all complete and in order on Wednesday, the opening day, they were much more nearly so than has generally been the case, and the catalogue at all events was ready—a great advance on some former occasions, when the catalogue could not be obtained till the exhibition was half over.

The bulk of the objects are arranged in the usual manner, in rows parallel with the length of the building; two extra departments being formed by architectural drawings, which are arranged in a room off one of the galleries, and by the Fire Prevention

Section, which has a place to itself in the small gallery in the corner of the building.

The architects' exhibits are less important than at the last exhibition, and need not detain us especially. They consist of a not very large collection of perspective views and elevations, many of them already familiar. Among the most prominent exhibitors are Messrs. Ernest George & Yeates; Messrs. Runtz & Co.; Messrs. Sugden & Son and Mr. Larner Sugden, nearly all of whose drawings show picturesque and original quality—a small view of a boat-house by Mr. Larner Sugden shows a very pleasing and original treatment; and Mr. Arnold Mitchell, one of whose exhibits, the sheet of "Small Country Houses," is illustrated in our present issue.

The exhibition got up by the British Fire Prevention Committee is the most important novelty, and may perhaps rightly claim our first attention. The most important exhibit is that of the Columbian Fireproofing Company, whose work came out so well at the Fire Prevention Committee's Testing-house. They exhibit a 15-ft. span construction, formed of two rolled iron girders embedded in concrete and seen in section, carrying a solid ceiling of concrete "armed" with steel laths embedded in it. The most interesting item of their exhibit, however, is the section, set on end on the floor, of a concrete floor and ceiling combined, on the same principal of "armed" concrete, with a ceiling finish of white glazed bricks with dovetail bond into the concrete. Regarded as a ceiling, this is a most solid and monumental piece of work, and looks as if it might last for ever; and we are more in favour of this solid and close construction than of the various forms of floors with air-spaces of which there are several in the room—one exhibited by this same firm. The supposed ventilation is of doubtful value in the case of materials which are not subject to dry-rot and other such ills, and we have always had an objection to the existence in buildings of empty spaces which are inaccessible; one never knows what may be going on there. Another article worth notice in this exhibit is the concrete floor made with bottle-glass broken small, which has the quality of being acid-proof, and has the appearance of being in other respects practically indestructible, while putting to good use an otherwise waste material. The company have got up their exhibit very effectively, and succeeded in giving it a more attractive appearance than is usual in the case of such very practical and undecorative processes.

An exhibit of some importance is that of the British Uralite Company, who have also another exhibit in the large hall. Uralite is a substance in the form of thin sheets composed of asbestos fibre and mineral substances, which is claimed to be absolutely fire-resisting; we saw a piece subjected to a severe test with the blow-pipe, under which it certainly did justice to its character. It is a fibrous sheet about $\frac{1}{8}$ in. thick. According to the patentees' statement:—

"Uralite can be cut with a knife or saw; it can be painted, grained, polished, and glued together like wood; it can be veneered to form panelling for walls or partitions for ships' cabins or for railway carriages; such panelling will not swell, crack, or blister. Uralite does not split when a nail is driven through it. It is not affected when exposed to moisture or very great changes of temperature,

and it can be impregnated throughout with any desired colour."

Its appearance and texture are in accordance with this description. In the exhibit it is shown nailed in slabs under joists to form a ceiling, and over joists to form a fireproof sheeting between them and the flooring boards. The exhibit in the main hall consists of a temporary hut covered with this substance in symmetrically shaped pieces held together by clips, in which shape it forms an exceedingly light and portable hut. The contents of the hut show how Uralite can be used for veneering, and can be painted, grained, and polished (we should prefer to dispense with the graining), in all cases forming a fireproof lining. It is certainly a material worth attention.

The Mural and Decorations Syndicate exhibit their system of wire network in which the meshes are covered with fire-clay put on moist and the whole baked, forming a terra-cotta mesh, the special object of which is that, being used as the first covering to an iron column or other such object, the external plastering forms a much closer key with it than with bare wire, and is less liable to be thrown off or loosened by the action of heat. It is used also as the core for a 2-in. partition of great firmness and strength. In going through the exhibition generally one cannot but be struck with the immense variety of means now available for making partitions of but little thickness and yet of solid, fireproof, and fairly sound-proof character; much more sound-proof at all events than the old 4-in. or 5-in. partition of quartering, lathing, and plaster, besides being infinitely more sanitary. There seems really little left to be done now in the way of improving the construction of partitions. Another compact construction for floors or partitions is exhibited in the "Mack" slabs and blocks by Messrs. J. A. King & Co.; the slabs have hollow reeds embedded in a specially-prepared plaster; these form "sealed air chambers," the usefulness of which we somewhat doubt; but the material is a very solid and sound one, and easily handled, being made in slabs 12 in. wide and 6 ft. long, built up in courses with breaking joint; and a $2\frac{1}{2}$ partition of this material is stated to have stood a fire test of an hour and a quarter. The statements made in this portion of the catalogue may, we presume, all be relied on, as they are made under the direction of the Fire Prevention Committee. Messrs. King & Co. have a separate exhibit in the main hall.

Mr. L. G. Mouchel exhibits drawings and photographs showing the application of the Hennebique system of piling, where the piles, called "ferro-concrete," are formed of concrete with steel arming embedded in them, and shod with steel spikes in the usual manner. It seems extraordinary that long piles (of the same or even thinner proportion than timber piles) formed of concrete should, even with the assistance of the steel arming, be able to sustain the heavy blows necessary in driving them; but a sectional drawing is shown of a large building which has been erected on very long piles of this material. One special advantage in their use is that they are not, of course, liable to be attacked by worms. For sheet piling they are said to be formed with a dovetailed section to stop out water, though we should feel rather sceptical as to their efficiency for that purpose.

Among the other exhibits connected with the construction of floors and partitions the Asbestos and Asbestic Company show examples of the application of asbestic plaster to walls, on ordinary wooden lath. The Banks Fireproof Syndicate show a large sectional drawing of their ventilated concrete floor with iron girders over which pass stirrups supporting steel laths to which the ceiling, of armed cement, is suspended. This is called their "patent ventilated floor," but, as before stated, we fail to see the use of the ventilating spaces, and would much prefer a compact floor like that of the Columbian Company mentioned above. The Banks Syndicate have also an exhibit in the main hall, in which is shown the use of their helical metal lathing as a foundation for the protection of stanchions, &c.; an excellent lathing, light, and affording a very good key. Mr. Arthur E. Brown, the agent for Eredi Frazzi of Cremona, exhibits various sections of their floors constructed with light hollow bricks, arched from terra-cotta skewbacks; the various forms of hollow brick are very good samples of material, and have a good appearance also. The Fire-proof Partition Syndicate exhibit a small hut made with their iron sheeting worked into a dovetail section corrugation and plastered or otherwise covered; they also show an exceedingly simple and apparently cheap floor formed of sheets of the same corrugated iron bearing on the lower flange of a rolled iron joist, and filled in with concrete above; the iron ought also to be covered below; this is not shown, but owing to the good key formed by the dovetail corrugations it would, of course, lend itself perfectly well to this. The sheets can be used up to 3 ft. bearing between joists, and are 4 ft. 6 in. long. The firm have an exhibit of a larger cottage in the main hall, and draw attention to the saving in space by the thin proportions of their partitions, but the "net gain of four inches on each partition" must refer to comparison with the old lath and plaster partition, and it is hardly worth while to make that comparison nowadays. Messrs. A. W. Green & Co. exhibit a concrete floor with a serrated tile ceiling screwed to the under side of it; the joints of the tile or terra-cotta slabs come under the lower flange of the iron joists—a weak point.

The New Expanded Metal Company exhibit their flooring made of rolled steel joists, arched steel channels and expanded metal partially concreted, and various specimens of expanded metal and concrete floors and partitions. They have also an exhibit in the main hall. The Pease's Tubular Construction Syndicate exhibit a curious floor of metal tubes filled in with some composition and concreted between; it has not much to recommend it. Messrs. Potter & Co.'s concrete floor slightly arched on the under side between iron joists, with a plaster ceiling suspended by rods from the centre of the concrete arch, is a simple and inexpensive floor.

Among exhibits of other classes the Non-Flammable Wood Company show a number of specimens of wood treated by their process, which in no way affects the appearance of the wood; its practical efficiency has been well tested, as our readers are aware. Messrs. G. A. Williams & Sons' fire-blind, of asbestos cloth, is an outside window-blind which can be lowered from within the room,

the bottom rail of the blind fixing itself automatically in a catch on the window sill; a simple and useful protection against fire in a neighbouring building. With this may be mentioned Mr. R. Buggé's "firesail," for covering the front of a house for a similar purpose; it is of asbestos cloth, and made with horizontal rows of pockets at intervals, which catch and detain the water from the hose and serve to keep the cloth wet by percolation from these pockets.

Messrs. Hobbs, Hart, & Co. have an interesting exhibit. They show among other things, ventilating and fire-resisting lintels for safe doors, made of steel pierced with openings and containing within a fireproof brick filling, with interstices through which air can percolate. They show also ventilating tubular adjusting shelving for strong-rooms, which can be raised or lowered as required, the strong-room being built around them. Their keyed and rebated party-wall doors, sliding on wheels, are so constructed that top, bottom, and both sides work into a rebate, and the door is provided with an automatic clutch bolt; an ideal door for the purpose. The same form of clutch bolt is a feature in their safe doors, holding the whole construction together against expansion from heat. The Crittall Manufacturing Company have an excellent exhibit of somewhat similar class. It includes a sliding wrought-iron door on rollers geared so as to reduce friction, and some admirably constructed iron window frames for factories, geared so that a number of the sashes can be opened on centres, as much or as little as is required for ventilation, by a single rod; the make of these is excellent.

Applications of slag wool are shown by Messrs. Anderson & Son, Messrs. F. Jones & Co., and Messrs. MacNeill & Co. Messrs. Pilkington Bros. exhibit their wired rolled glass, which stood severe tests for fire-resisting quality; and the Luxfer Prism Syndicate have an exhibit of various special glazings of $\frac{1}{4}$ -in. glass, which are not only a resistance to fire but have the additional merit of being decorative in appearance; the 4-in. squares of polished plate glass, with their thin metal frames, form as agreeable a way of filling up a window as could be desired. Their prism exhibit is in the main hall.

The British Fire Prevention Committee has its own exhibit, including plans of the new testing station at Westbourne Park, models of the testing plant, and a number of photographs of the results of tests. In the same department Mr. Charles E. Goad exhibits a large map of London showing the sites and areas of notable fires, with the dates.

Altogether, the Fire Prevention exhibit has been exceedingly well got up, and contains a great deal of matter of practical interest.

Into the immense collection of exhibits of all kinds in the main hall we cannot go in detail in this issue, but we may mention some exhibits which are specially interesting. Among these is that of the Moreau Marble Company. We have a great dislike generally to imitation marbles; but the patentees of this material maintain, with some show of reason, that it is not an imitation, but that they are actually making marble by the same process by which Nature makes it, only in a few weeks instead of a few thousand years. They take a rather soft

and permeable limestone (what they are at present using is from the south of France), and chemically permeate it with various colouring matters which sink into the stone, and are not a mere surface colouring, as in scagliola. The completed material takes a fine polish, and many of the specimens are of beautiful colour and marking. Used as a veneer, it is about one-third the price of Nature's marble, and it certainly is worth more attention than most of the ordinary methods of imitation of valuable materials. Mr. White, of Bedford, has some very well-designed woodwork in the shape of mantelpieces, seats, &c., all of them simple in general form but unimpeachable in taste. The London Fireproof Plate Wall Company (which also has an exhibit in the Fire Prevention room) show fireproof partitions consisting of slabs containing vertical chambers. These are made in slabs about 2 ft. square and 3 in. thick, are said to be soundproof, and, as partitions, require no plastering. The catalogue states, "By this system of construction there is no weight on the floor, and a wall can be papered, painted, or distempered within a week from erection." The latter part of the statement we can readily believe, but the "no weight on the floor" we fail to understand. The slabs are very heavy in themselves. Is it supposed that they are put together so as to be self-supporting? If so, the means of doing this are not made obvious. The Wood Carving Company, of Windsor Works, Birmingham, have brought machinery to the assistance of wood-carving in a manner to which there is at any rate far less objection than in the case of the so-called machine carving of which we hear too much nowadays. Machinery is used to rough-out the work, which is then finished by hand. The general flow of the design must of course be limited by the capabilities of machinery, but at all events the finish is not mechanical. There are some pleasing specimens on view.

Among other exhibits connected with decorative objects is that of the Newellite Glass Tile Company, who produce an opal glass tile for which, though very thin, they claim an entire immunity from surface cracking or crazing. The substance of the glass is left as it comes from the furnace. The backing is a rough surface which forms a good key, but the special point claimed for it is that it has an elasticity which gives to any shock or vibration; "there is between the glass tile and the cement which holds it an elastic film which allows either substance to contract or expand independently of the other." This seems ingenious, though we are not much in favour of so very thin a substance as a wall-covering; the cost of Newellite facing to a wall of ordinary stock bricks is said to be 25 per cent. less than that of glazed bricks, and no doubt that will be a consideration in some cases; but on the whole we prefer the glazed bricks. Ripolin paint, which can be used with either a glossy or a flatted surface, is well represented at the stand of "Ripolin, Limited"; it shows some beautiful surfaces of colour and white, and for this also it is claimed that the enamel-looking surface will not crack with any moving or twisting of the material on which the panel is laid. At the stall of "Veronese, Limited," are shown specimens of decorative work in "gypsite," a thin and light material made in pretty large sheets, on which ornament can be embossed

and raised with great sharpness and finish. It is one of the numerous substitutes, in fact, for plaster-work modelled *in situ*, and can be used either for ceilings or walls. In the same compartment is exhibited a very pretty and new form of decoration by the Cloisonné Glass Company. This consists of wire cloissons formed in the usual way, but on a clear sheet of glass as a ground; the spaces are filled in with powdered coloured glass, as the enamel is filled in in ordinary cloisonné, and a second thin sheet of clear glass put over it; it thus forms a coloured glass design protected between two sheets of white glass. It is a new method of treating glass decoratively which seems quite legitimate, and has a good effect.

NOTES.

THE suggestion made by Mr. The Memorial to G. F. Bodley, in a letter to the Queen Victoria.

Times a few days ago, that the proposed monument to the late Queen should be erected in the St. James's Park lake, rising out of the water, and connected with the banks by two bridges, is worth consideration, and shows the feeling for the picturesque in the combination of architecture with water which might be expected from an artist like Mr. Bodley. But he passes over one point which we should have thought would inevitably have occurred to an architect. The St. James's Park lake is an irregularly-shaped piece of water, belonging to the "wriggling" school of ornamental gardening of the earlier part of last century. No satisfactory effect could be got with an architectural monument arising out of such a lake; the lake itself, or the portion contiguous to the monument, would have to be "architecturalised" into a formal and symmetrical shape, say a square or a circle, in order to form a proper architectural combination with the monument. That portion of the lake should be turned into an artificial basin, with stone steps round the edges, and pedestals for urns or sculpture as decorative objects in subordination to the monument. We do not know that we are disposed formally to recommend the adoption of the site in preference to that already suggested; we are only pointing out what should be a necessary condition for its success. If any idea of this kind were entertained, it would perhaps be still better carried out in the centre of the basin near Kensington Palace, which is already formal in shape, and which is on higher and more conspicuous ground.

Condition of Stonehenge.

SIR EDMUND ANTROBUS met at Stonehenge, on the 12th, the representatives of several archaeological societies, to consider the best means of preserving the remains from further injury. Nothing in the way of restoration is to be attempted, but it is proposed in the first instance to raise the large stone which at present leans over what is called the "altar stone," and which is in a rather precarious position. It is also proposed to examine the large stones numbered 6 and 7 on Professor Petrie's plan, with the view of putting them in a better position to support the lintel. Sir E. Antrobus also wishes to obtain permission to divert the roadway which at present passes near the stones, in order to put a wire fence round the monument at a sufficient distance not to interlere with

its effect. We hope he will obtain this permission, as it is of great importance that the stones should be fenced in some manner against the possible depredations of the thoughtless class of visitors. Sir E. Antrobus has engaged Mr. Detmar Blow, the architect who has done so much towards repairing ancient buildings in a conservative manner, as his professional adviser; and under Mr. Blow's superintendence we may feel sure that not a stone will be touched except for necessary repair or security. All who are interested in the conservation of this ancient and mysterious monument, which is a matter of national importance, ought to feel much indebted to Sir E. Antrobus for the wise and public spirit in which he is acting with reference to it.

GOOD fortune has attended New Discoveries Professor Furtwängler in his at Ægina.

expedition to Ægina, where he went to explore the ruins of the Temple of Athene. He has long cherished the hope that more fragments of the famous "Ægina pediments" might be brought to light by a systematic search *in situ*. He left Athens on March 30, and the very first day of digging yielded not only several interesting fragments, but two heads; they were found lying in front of the east pediment, but Professor Furtwängler conjectures that they belong to the west: the conjecture is based, of course, on considerations of style. It is now nearly a century since the "Ægina pediments" were discovered and brought away by Mr. Cockerell. England lost her chance of buying them, and they were secured by the Crown Prince of Bavaria for 20,000 scudi, and ever since have been lodged in the Glyptothek of Munich. Every one will rejoice that to the Munich professor who has done so much for their interpretation should fall the satisfaction of adding to the treasure.

The Royal Courts of Justice.

IN their annual report the General Council of the Bar express regret that no steps have yet been taken to carry into effect the scheme approved some time since by the Office of Works for the improvement of the access from the central hall to the Court corridor. We trust that some member of the Bar will, at the annual meeting next Tuesday, when the report is discussed, suggest that some more vigorous steps be taken to effect this needed improvement than mere expressions of regret. Unless pressure is brought to bear on the Office of Works, improvement will not be undertaken at the Law Courts. A deputation should wait on Mr. Akers-Douglas and attention should be called to the matter in Parliament. There are other points at the Law Courts in regard to which the Council of the Bar should take some action—the intolerable stench and want of air in the court corridors, the absence of artificial heat in the passages out of which the offices open, and the bad lighting throughout the building. We fear the Council of the Bar are inclined to deal too tenderly with the authorities.

Sanitary Warranties.

THE case of De Lasalle v. Guildford, which was decided by the Court of Appeal at the end of last sittings, is likely to become a leading decision. In the first place, it decides

that a statement that the drains of a house are in good order is a warranty, for it is a statement of a fact of which the buyer or lessee is ignorant, and on which the latter is likely to exercise his judgment. The court further decided that such a warranty is collateral to a lease in which no special terms are inserted as to the condition of the drainage of a house, and that it can therefore be put in evidence, and that if it is proved that it is broken, the lessor or vendor is liable for any damages which can be proved to result from this breach. The decision was in many respects one full of legal technicalities, for in the first place, the difference between a warranty and a representation is not very clear to the lay mind. Of course, in every case it has to be ascertained whether a statement is a representation or a warranty. If it is a warranty, its mere breach will carry damages; if it is a representation, it must be shown to be fraudulent. The importance of the decision lies in this, that there is now a considered judgment of the Court of Appeal which is distinctly in favour of the buyer or lessee—in other words, a vendor or lessor is liable if he states that the sanitary state of a house is good and it proves to be bad.

Corrosion of Pipes in Brooklyn.

A PAPER in the "Journal" of the American Institution of Electrical Engineers by Mr. S. Sheldon, on "Electrolytic Corrosion in Brooklyn," gives many data which illustrate the extent of the damage done by leakage currents in the vicinity of electric tramways. Brooklyn spreads over sixty square miles, and is covered with a network of electric tramways, some of which have been in operation since 1892. At certain times of the day 1,100 cars are running, and they require a current of 47,000 amperes. This current returns to the seven central stations mainly by the rails and return "feeders," but in addition the East River and the iron structure of the elevated railway of the Brooklyn Rapid Transit Company are intentionally employed. There are, of course, large stray currents flowing in the water and gas mains. The wrought-iron service pipes of the gas mains have suffered severely. In one block of buildings thirty-eight service pipes were completely destroyed in three years. The Gas Company also complain of an abnormal increase in the leakage of gas, which is now about 14 per cent. of the total output. The lead sheathing of the Telephone Company's cables is pitted and perforated in many places, and the armouring of the mains of the Edison Electric Lighting Company has suffered very severely from electrolytic corrosion. Mr. Sheldon expresses surprise that the cast-iron water mains have been very little affected, and suggests that their exemption is due to the non-conducting silicious compound formed on the surface of the mains in the sand mould in which they were cast. The various companies keep inspectors to measure the difference of electric pressure between the rails and the nearest gas mains. When the leakage current flows from the rails to the mains little harm is done, but when the current is in the reverse direction then trouble ensues. Mr. Sheldon states incidentally that at certain times of the day the difference of pressure between the two ends of Brooklyn Bridge is twenty volts. This paper shows that electrolytic corrosion is very insidious, and many years may elapse before its effects become manifest.

SOME extensive alterations are being made at Boxley Abbey House under the superintendence of, we understand, Mr. H. Bensted, of Maidstone. The house was built, *temp.* Henry VIII., by Sir Thomas Wyatt, the poet, of the neighbouring Allington Castle, after the dissolution of the abbey, of which the yearly revenues were then valued at 219*l.* It stands on the east portion, and opposite the brick-faced piers of the outer stone gateway, of the enclosure, about fifteen acres—which is encompassed with ruins of the wall of the once famous Boxley Abbey whose abbots were summoned to Parliament. To the west, within the wall, is the large granary of the monks, and beyond on the by-road outside the wall are Abbey-gate and the remains of St. Andrew's Chapel. At an investigation of the site of the Abbey church made a few years ago it was found that the high terrace in front of the house embodies portions, with the tracery of two windows *in situ*, of what is believed to be the south aisle. Boxley, the Boseleu of the Domesday survey, three miles distant northwards from Maidstone, stands in the beautiful valley of Mid-Kent, and lies just below the range of chalk hills along whose southern slopes winds the ancient British track—the later "Pilgrims' Way"—marked with its trees of holly, yew, box, and thorn that once formed the principal road from the south-west of England to Sandwich Haven, crossing the Medway at Aylesford. The manor formed one of the 184 manors which Odo, Bishop of Bayeux, held in Kent, and was granted by Richard I. to the band of Cistercian monks whom William d' Ypres, Earl of Kent, had brought thither in 1146 from Clairvaux, in Burgundy. The White monks of St. Mary's Abbey tilled the fruitful soil of the gault and Henry III. gave them a market at Farthings, near the Abbey gate. Whilst resting at Boxley Abbey, in 1321, on his way to Leeds Castle, Edward II. granted the charter to the citizens of London, giving them free choice in their election of Mayor, and it was there that Cardinal Campeggio met Archbishop Warham to discuss the matter of the King's divorce. St. Andrew's Chapel now forms a way-side cottage in the walls of which are preserved some remains of a three-light window, the west and priest's doors, and the stone-work of two squints.

This property, comprising the Castle and 750 acres of land, which was withdrawn after a bid of 40,000*l.* at the Mart a few months ago, has recently been sold. The castle was restored for Captain Kenneth B. Balfour, after the fire of January 26, 1896, from the plans and designs of Mr. R. S. Balfour (see the illustration in our number of May 20, 1899). Branksea, or rather Brownsea, Island was the seat of the late Right Hon. G. A. F. Cavendish Bentinck, who restored the Castle in 1888; after his death Captain Balfour purchased the property (1892). The island, famed for its beds of white clay, lies in the bay between Poole and the Isle of Purbeck; at its east end was built of brick, in 1545, a massive rectangular tower which was shortly afterwards fortified and strengthened with defensive outworks by the Corporation of Poole. In 1576 Queen Elizabeth appointed Sir Christopher Hatton to be castellan. The castle was dismantled in 1722. Some fifty years

afterwards the remains were rehabilitated by Humphrey Sturt, who brought much of the surrounding waste of sand, furze, and heath into cultivation. Fifty years ago, Colonel Waugh, of Campden House, Kensington, bought the island and made extensive additions, including a Tudor front in Portland stone, to the Castle.

Manchester Fire Station Competition.

WE are glad to find that the Corporation have amended the two conditions in this competition to which we took special objection, and which in fact would have prevented any architect of standing from competing. They have substituted the usual architect's commission of 5 per cent. for the 3 per cent. originally offered, and have agreed to appoint a professional assessor. They have not, however, yet done all that a competition committee ought to do in such a case. They retain the objectionable though usual condition that the competition premium should be considered as part of the architect's commission. We have over and over again pointed out the unfairness of this, since the preparation of the competition design is always a work extra to the preparation of the working drawings. The conditions also include the following sentence:—

"No other commission or payment will or shall be made to the architect for or in respect of any extra works or for any extra service out-of-pocket expenses or otherwise whether rendered done or performed before or subsequent to the date of these presents."

This, as far as the meaning of the words goes, appears to include a refusal to pay the architect's travelling expenses (if any), which is mean in itself, and contrary to the requirements of the Institute of Architects. Probably no Corporation would treat a lawyer in that manner; and in fact the legal profession would not submit to it. Again, why is the architect to have no remuneration for his services in connexion with extra work? The extras cannot, by the conditions, be ordered without a resolution of the Committee confirming them; and if they authorise the architect to carry out extra work, they ought to pay him for it. The percentage system of commission may be a bad one, but as long as it exists and is accepted, the architect has the same right to his commission on extra work as on the original contract sum.

CONSTRUCTIONAL STEELWORK AS APPLIED TO BUILDING.*

THE application of constructional steelwork is an extensive subject, divisible under many heads, each of which is ample in itself to form a complete and separate paper, especially as regards the problematic or mathematical considerations, and therefore I purpose avoiding the latter to a considerable extent, with the view of making my remarks somewhat historical, and the deductions therefrom as practical as time will permit.

I will ask you to go back to this time about fifty years ago, back in the nineteenth century, when the whole of the civilised world, I might say, was on the tip-toe of eager expectancy, for on May 1, 1851, the Great Exhibition was to be opened in London by her late most gracious Majesty the Queen and the Prince Consort. It proved a glorious sunny May day when the great festival of labour was inaugurated with immense enthusiasm in the presence of a vast concourse of people, and the first iron and glass building became an accomplished fact, notwithstanding the many pro-

* A paper read by Mr. Archibald D. Dawson, A.M.I.C.E., before the Bristol Society of Architects, March 18.

phetic pessimist spirits, eminent engineers amongst their number, who were quite sure—because they knew—that the first gale of wind, or the first crowd of visitors in the galleries, would assuredly lay the structure in ruins, and thus for ever wreck the ambition of the two great minds which conceived and worked out the idea. Even if it proved capable of standing, and a success, therefore, structurally, it would precipitate our national ruin, as the foreigner would be able to learn all about our machinery, our details of construction, and business methods, and by making use of the information would ultimately cripple and destroy our industries by absolutely driving us out of the world's market.

Events have, however, shown that these destructive prognostications were absolutely fallacious, for the greatest iron and glass structure the world ever saw more than satisfied its constructors. It now stands, as you are aware, re-erected, somewhat modified, at Sydenham, proving beyond doubt that a building of the kind is not only stable and safe, with enormous crowds perambulating the place, but practically indestructible. The Great Exhibition became the pride and glory of the nation as a whole, and especially of every architect and engineer who had an opportunity of seeing and studying its then called extraordinary construction, at once original in conception and in every detail. The late eminent engineer, Robert Stephenson, was so struck with the beauty of the designs when submitted to him by Mr. Paxton that he exclaimed, "Wonderful! worthy of the magnificence of Chatsworth, they are a thousand times better than anything that has been brought before the Commission." Some one of the visitors—probably an architect, for he had an eye to the beautiful—said, on viewing the Exhibition from one of its best aspects, "The eyes tire not, for there is beauty everywhere; the limbs grow not weary, for the mind is occupied; the mind, before enlarged, enlarges; and the heart, if rightly attuned, lifts itself from art and Nature up to Nature's God."

It is not desired, except in the merest outline, nor is it my intention to do so, that I should describe the construction of the Exhibition, although it would be exceedingly interesting and instructive, even nowadays, and you may therefore ask why I allude to it at all—well, if you consider the constructional iron point of view you will readily come to the conclusion that all our present iron and steel framed buildings may be said to have sprung from the Exhibition. Prior to it there were few buildings above the size of a greenhouse constructed wholly or in part of metal, excepting the solitary instance of the house erected by Mr. Paxton in 1848 at Chatsworth for the new plant called the "Victoria Regia," which found its home with the Duke of Devonshire, and even this building could only boast of an iron and glass roof on the ridge and furrow system, which the then King of Saxony, who was visiting Chatsworth at the time, called "a tropical scene with a glass sky."

In 1841 and 1845 there were some iron buildings of from 2,400 ft. to 5,200 ft. super sent out to Mauritius, constructed with cast-iron sills, stanchions, and curbs, with wrought plate sides, and cast-iron roofs, the latter being formed with cast-iron plates between tee irons. The only woodwork used was in the mahogany sashes and doors.

I think we shall be justified in dating the rise of iron and, as a subsequent result, steel framed buildings and American sky-scrappers, which are a more recent development, from the year 1851, for immediately after the Exhibition was found to be a success structurally, iron and glass buildings of almost every kind were designed by architects and engineers, to say nothing of successive Exhibitions which have been put up in various parts of the world. The Great Exhibition was constructed with cast-iron columns, in lengths superimposed, and cast lattice girders, throughout, with little or no wrought-iron below the roof level, and I venture to think that therein lies the secret of the durability of the metal walls. It has, after a century's experience, become a well-established fact that, out of water, no building metals with which architects have to deal resist rust like cast-iron. Other proofs of this feature in cast-iron may be found in the Coalbrookdale Bridge of 100 ft. span, built about 1777, and Wearmouth Bridge, of 230 ft. span, built in 1790, and many other similar structures erected to within the last twenty years.

Since then iron or steel has become more generally used. Brick, or even stone, piers and pilasters seem to occupy too much space in these days, when land is valued at sovereigns laid over its surface. Consequently, for supports generally, and as superseding the old-fashioned oak story posts and corbels, nothing is so easily adaptable as cast iron, as it can be moulded into any and every shape it is possible for an architect to require; and therefore even now, with all our modern steel applications, I think we ought not to give up our cast work altogether, as we are in a fair way of doing.

Perhaps the usual method of erecting tiers of columns for several stories by means of simply bolting their flanges together is not altogether satisfactory, as the stability entirely depends upon the resistance of the bolts to shear, and the abutment afforded by the several floors; moreover, in the case of a big fire, water gets through the core holes and joints, and frequently causes greater destruction to the columns than the action of the flames. To prevent this possibility nothing surpasses the use of spigot and socket turned and bored joints, through which neither air nor water can get into the inside of the barrel or shaft. In all my important work I adopt this method of jointing. The girders can be carried, as usual, upon gusseted brackets, and each upper floor can be erected and completed independently of the lower, which is not always the case when flanges are used. I am at present engaged on a building where the architect prefers bolted flanges, and places the floor girders upon the flange of the upper column, so that two tiers of columns must be erected before a floor of girders can be fixed. I certainly fail to see any constructive advantage in adopting such a system, but a considerable amount of inconvenience and delay. Of course cast stanchions cannot be dealt with in the manner I have described for columns, they can only be flange jointed on each or alternate floors, according as they are one or more stories in height.

As wood beams have gone out of use the intermediate box or hollow block connecting the upper and lower columns or box ends to the columns themselves have to some extent been given up, but not altogether, for not withstanding the introduction of steel or iron girders, which are of much less bulk than wood beams, these boxes are frequently still used, and I am often surprised at the inefficiency of the flange cheeks and gussets, as generally cast; they often fracture, and bring the weight upon the girder, and so remain sometimes for years undiscovered, creating a risk, the result of which might be terribly disastrous. This is not supposition merely; I have met with numerous cases, and I have also one at present under my notice, where all the floors and roof have had to be shored up five stories, so that the broken bases may be taken out and new ones of a more modern construction put in. The better plan is to bolt all girders through their flanges upon good gusseted brackets, and to web cleats or brackets, leaving the columns to stand as one unbroken tier from top to bottom.

Nowadays, when the fire question is such a serious one, it is often desirable to case the cast supports to render them, perhaps not fire-proof, but fire-resisting, and I think there is no better protection than a good coat of fine concrete, not coke breeze. Some long columns and stanchions which were so cased ten to fifteen years ago are still absolutely sound from top to bottom. But, of course, if casing is adopted, it is absolutely necessary to cast the columns or stanchions with bevelled grooves or fillets to hold the casing materials, something like the two examples on the table. I cannot help thinking that much of the composition lagging and casing with which supports are often covered will prove delusive in a great fire, as many of them which have been tested within my knowledge gave strong evidence that the casing was quite free of the casting inside, and therefore liable to come off under the action of fire and water.

As the oak post was displaced by the cast support, so is the cast support now rapidly being superseded by the steel column or stanchion, which, constructively, may be termed quite a modern invention, which has worked in a very short period an enormous revolution in building construction all over the world, and perhaps more especially in America.

I think the whole secret lies in the fact that by means of rivetted work, so easy a thing

now with steel joists rolled almost any length—60 ft. not being a limit—it is possible to make up stanchions in very great lengths in one piece, which would be impossible in cast iron, so that when erected two, three, or four girders in height, the girders can be put in place and several floors become ready for flooring, so that a considerable time may be saved to the builder. I have recently constructed a number of steel stanchions, 80 ft. and 82 ft. long, in one length, having brackets and gussets rivetted on at the several levels for sills, cornices, floor girders, and roof ties, so that it was possible to roof the place in before the building had reached the second floor; this was actually done in one instance.

The calculations for and the construction of steel stanchions require much greater care and consideration than for cast columns, because, in the ordinary way, the architect would have his column or stanchion table at hand, but in the case of steel stanchions each has to be treated on its own merit, and the variety of sections available for stanchions being so considerable, it would be almost impossible to compile a complete table. Buildings are not put up to suit the stanchions, but the stanchions must be made to suit the buildings. Hence, in constructing stanchions it is first necessary to determine what length each segment shall be and what strutting is available, especially in the direction of the narrowest width, and so on, for the total length and number of floors; for instance, if there is a five-story building requiring stanchions, with 10 tons of roof, 20 tons on each of the two floors, then 25 tons and 30 tons on the two remaining, giving a total of 105 tons on the bottom length, it would be well to make the bottom length of stanchion for three floors, starting with a 50-ton top load, having an additional 25 tons probably 12 ft. lower down, and 30 tons 15 ft. still lower down (illustration No. 2), the section would necessarily vary in each height, according to the load, the proportion of width to depth, and the value of the strutting.

Whenever possible, it is an excellent plan to use one section of joist from top to bottom, and get additional strength by means of plating; it facilitates construction and ensures a greater uniformity than if each floor had its independent jointed-up stanchion. The economical ratio for an unstrutted stanchion should range between 30 and 40, which gives 12 in. for the least width of a 40-ft. length, and 16 in. for a 50-ft.

The form of a stanchion is stronger as it approaches equality in width and depth; hence it is a great mistake to insist upon very narrow stanchions, although deep. Of course, the same rule applied to cast stanchions, but a great deal of stiffness was got out of an abundance of metal, which it was easy to obtain, while in steel the amount of metal is limited to thickness, and should be reduced to the proper minimum by exact calculation.

Generally, the following well-known formula will apply to single-loaded stanchions with carefully-bedded ends:—

- b. Breaking weight per inch of section.
 - r. Ratio of length to least diameter.
 - C. Constant for the material and section used.
 - c. Approximate crushing unit-strength of material.
- $$b = \frac{C}{r \times C^2} \text{ for a rolled joist stanchion 20 ft. long}$$
- $$12 \text{ in. by } 6 \text{ in.}$$

$$b = \frac{28}{40 \times 40} = \frac{28}{1600} = \frac{28}{1600} = \frac{28}{1045} = 10.94$$

breaking weight per inch of area.

Then s safe working load.

$$a \text{ area of section, which for a } 12 \text{ in. by } 6 \text{ in.} = 14.4 \text{ in.}^2$$

$$f \text{ factor of safety.}$$

This factor is obtained from tests upon various sections, and is usually expressed $\frac{r}{4} \times \frac{a}{20}$; as the ratio for a 12 in. by 6 in. beam is

$$40, \text{ then } f \text{ is } 4 \times \frac{10}{20} = 6 \therefore s = \frac{b \times a}{f} = \frac{10.94 \times 14.4}{6} = 26.2 \text{ T safe load, which agrees}$$

exactly with some of the tables.

In dealing with rivetted work due allowance must be made in the area for all holes which exist in the same plane or sectional line. I do not say that the mere rivetting on of a bracket with two or three rivets is a very material matter, but in the case of a box section it is quite possible to lose as much as $\frac{1}{4}$ in. of the area, depending upon the number of plates employed and the section adopted.

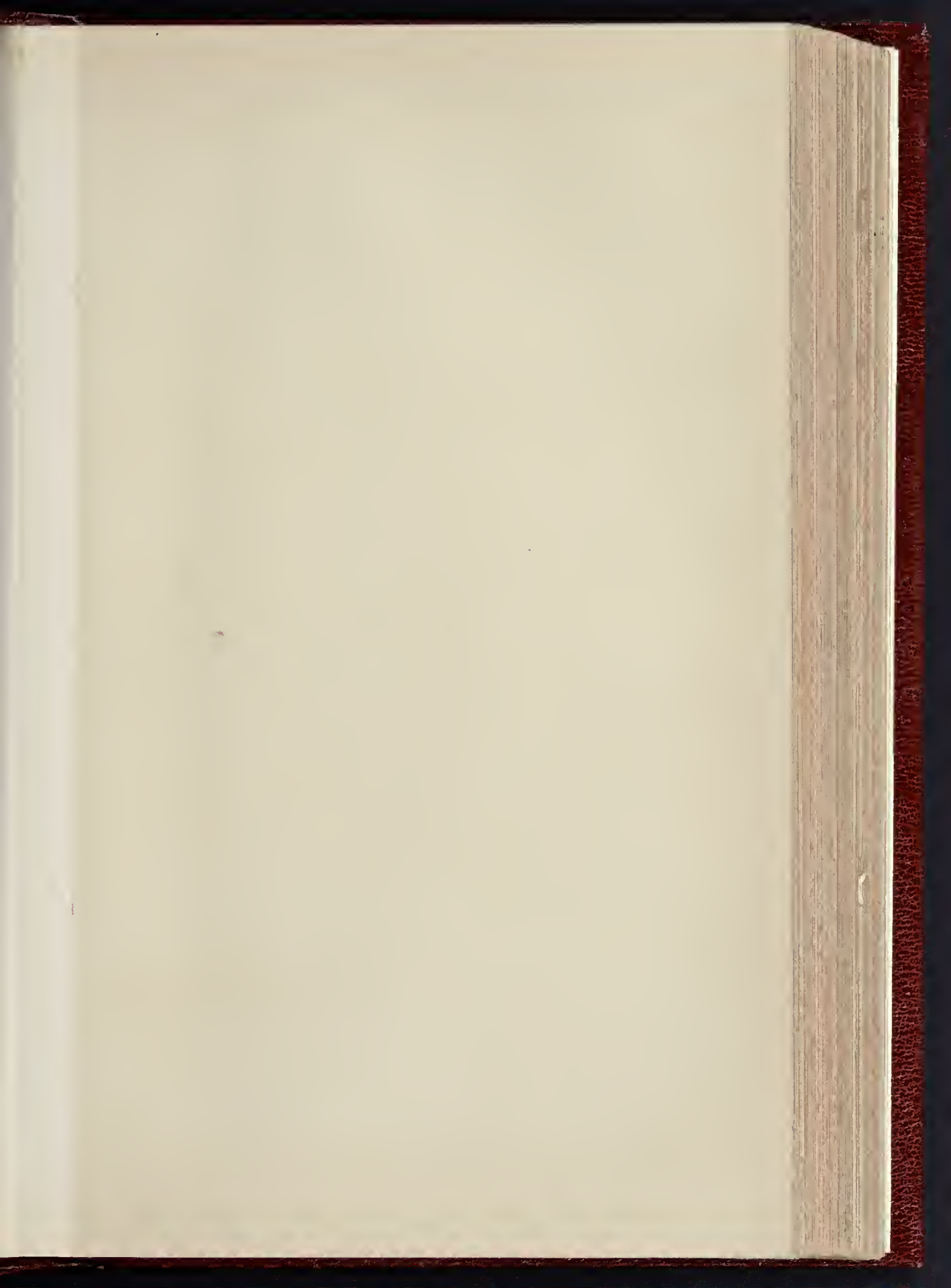
It should be remembered that the value of b in the formula above depends entirely upon the sectional form of the stanchion. The Phoenix form gives the greatest value and the box form the next. The variation is in the constant C , which runs between 900 and 2,480. The bedding of stanchions is a very important matter, and should be most carefully carried out, otherwise all the value of scientifically worked-out stanchions will be entirely nullified.

Depending on the value of steel, a 10 in. by $\frac{1}{4}$ in. joist on 20 ft. would carry 9½ tons, but a 10 in. by 5 in. would carry 13 tons, and a 10 in. by 6 in. 2½ tons; the increase is not derived so much from the additional metal as from the widening flanges, there being only 2½ lbs. per foot in the 10 in. by 5 in. over the 10 in. by $\frac{1}{4}$ in., and 12 lbs. in the 10 in. by 6 in. over the 10 in. by 5 in., the areas being 7.64, 8.58, and 11.01 respectively, and which indicates a safe working load of 1.24 tons per square inch of area for the 10 in. by $\frac{1}{4}$ in., 1.55 for the 10 in. by 5 in., and 2.06 for the 10 in. by 6 in., which appears very little indeed until you consider that the proportion of height to least width is 53:48 and 40. The effect of reducing this proportion will be readily seen by taking a length of, say, 10 ft., a more workable one for such sections, then the 10 in. by $\frac{1}{4}$ in. will carry 26.7 tons, the 10 in. by 5 in., 30.4 tons, and the 10 in. by 6 in., 48 tons, indicating a working load per square inch of 3.5, 3.62, and 4.03; the factor of safety in all cases is taken at one-fourth to one-sixth of the ultimate.

Practically there is no limit to the sections, which may be compounded out of joists and channels, plates, and angles. A sufficient variety exists to meet every possible requirement of the architect, besides which there are special sections, notably what are called Phoenix sections, consisting of segmental pieces, four or six to form the circle, and rivetted together as illustration No. 3; these sections give considerable result under actual test. A column 28 ft. long, having a ratio of 42 in length to diameter, gave a breaking weight of 16 tons per square inch, but at a ratio of 10 to the breaking weight was increased 18 tons per square inch. These sections are used to a great extent in America for diagonal and vertical bracing, and also in some forms of bridge work, but these and similar sections are only obtainable if a quantity is required, as they are not stocked. These sections are, however, from their shape very awkward to deal with if there are side girders to connect, and superimposed or continuous lengths.

Wherever long lengths of stanchions are used great care is necessary to ensure proper strutting by the girders, especially if the load is not calculated upon the total length, as the stanchion will depend upon strutting for effectiveness and rigidity. Angular bracing also is desirable wherever possible, so as to prevent any tendency to rack, but where bracing is not convenient, long single or double six-holed cleats and bolting should be allowed for all joints between girders and stanchions. Another method of ensuring good strutting and connexions, and at the same time shorter stanchions, is by running the girders of each alternate floor in between the stanchions and bolting up and down to each. In this case, of course, care must be taken to give sufficient strength in the girder ends to transmit the load through (illustrations were shown from work which was recently carried out). Where girders run all round a building of stanchions they should be properly mitred or jogged at the four angles, bolted together, and fishplated end to end, so as to form a complete platform upon which to start the upper walls and next tier of stanchions. Where it is impossible or inconvenient to deal with very long lengths of continuous stanchions, and side girder bearings are not objectionable, the continuity can be effected in a very satisfactory manner by adopting the fishplated joints, having all abutting ends machined and rivetted up *in situ*, as illustrations Nos. 3 and 4. This method avoids all cap and base joints, but, as I have before said, the strutting and bracing must not be lost sight of, not on account of any inherent weakness, but to maintain in equilibrium what may be perfectly correct both in calculation and construction and against contingencies, say, for instance, a settlement or other unforeseen circumstances.

In this country we have not gone to the same extent as the Americans in erecting lofty buildings, and I sincerely trust we never shall, but





HOUSE AT CROWBOROUGH, SUSSEX: THE



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DINING-ROOM.—MR. M. H. BAILLIE SCOTT, ARCHITECT.

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we may do well to follow them to some extent in constructing steel "cages," so that the weight is not carried by the walling at all, but entirely by the steel work, which should be substantially cased all round and built up between, as, judging from recent disasters in America, I think that the risk of a veneered building in case of a great fire is very considerable indeed, and that there will be many more instances of total destruction and serious loss of life in time to come. A mere veneering of marble, stone, or brickwork is wholly insufficient to protect the steel work from fire.

During the last three or four years solid rolled steel columns have been introduced, and they are doubtless in some instances of considerable value if not treated as continuous, because the connexions for change of diameter, and which at the same time have to carry the floor girders, are very unsatisfactory. I have tried them with several forms of bearing joints, and, not considering them sufficiently rigid in fires, have abandoned them in that formation. For single columns to carry isolated weights they are useful, as occupying very little room.

Before leaving stanchions I might mention the present approximate costs of carrying, say, 100 tons on a 14 ft. high support:—

Best stock brickwork in cement 3 ft. 4 1/2 in. by 3 ft. 4 1/2 in. and template	£15 17 6
Blue-black brickwork in cement 2 ft. 7 1/2 in. by 2 ft. 7 1/2 in. and template ...	12 14 0
Cast column, 10 in. dia. by 1 1/2 in. metal ...	0 15 0
Steel column, 7 in. dia. by 1 1/2 in. metal ...	17 15 0
Steel stanchion 8 1/2 in. by 9 in.	7 18 0

It is assumed that the footings would be practically the same in each case. From this table it will be seen that a steel column occupies the least floor space, but that the steel stanchion is the cheaper construction.

One drawback to the stanchion, if cased circular, as a column, is that it would scarcely finish under 14 in. in diameter. Except in fire-resisting buildings or for decorative purposes, it is very seldom that steel stanchions need to be cased, and where for appearance or convenience in certain businesses a circular form is preferred to the rectangular, with its edges and angles, and where casing is undesirable, the cast column still stands of undoubted service.

The modern use of iron and steel for constructional purposes has entirely revolutionised the art of building, and perhaps in no department so much as that in which girders play so important a part. In the early days experimental researches and calculations for cast girders were carried to a very considerable extent of minuteness by Tredgold, Hodgkinson, Fairbairn, and others. I think the study of Tredgold's practical essay most interesting, as well as instructive, and eminently useful. But prior to their day cast-iron beams, as they were usually termed, were first used in cotton-mills near Manchester about 1801. Messrs. Boulton & Watts were the architects. Watts was the celebrated man of that name, and, so far as I can discover, must have been the inventor of cast beams. These served their purpose and day admirably, but now they are looked upon as being needlessly heavy, frequently a source of great delay, and expensive in production, carriage, and fixing, when compared with rolled steel joists, or in some instances riveted plate girders. Moreover, cast beams are a somewhat uncertain article, subject to all kinds of chance misfortunes in moulding and cooling, and from destruction by sudden impact, owing to undiscoversable defects. Many serious accidents have, as you are doubtless aware, occurred through their failure. The only remedy against disaster is by testing every individual beam, and not to rest content with testing one or two of a set. I always test those I use by hydraulic press and gauge, and have occasionally found a beam to fail from some inherent defect in the casting, while the metal itself proved to be fully up to specification. Nevertheless, no kind of girder is so suited for damp basements and similar situations, or as proof against atmospheric changes, as the cast iron, for it has by this time been satisfactorily proved that neither wrought iron nor steel, whether in the form of rolled joists or built girders, will resist rust arising from atmospheric changes, acid, smoke, or steam. It is only needful to look at the state of the girders and columns on some of the London railways to discover what havoc is being made with the steel and wrought iron work, while cast girders and bridges put up 100 years ago are scarcely pitted in the skin or outer surface.

The Liverpool Overhead Railway is another instance of the difficulty in preventing, or rather avoiding, the possibilities of rust in the outdoor steel work. The engineer states that there are 80 acres of steel surface to be protected, out of which 60 acres are black varnished, and the remaining 20 acres are painted with an oxide preparation. The painting has to be regularly carried out every two years. I have quite recently used cast girders in deep sub-basement strong-rooms in preference to wrought or steel, and as a further precaution they were cased all round and over the projecting flanges with concrete. Most of the spans were 24 ft. and 27 ft., and the ordinary fish-bellied form was adopted as the most economical, made of a metal to stand 9 tons per square inch tensile, and to safely take 6 to 7 tons per square inch in compression.

It should be understood that I am only referring to cast girders for certain purposes in buildings, and not for bridges or other structures subject to heavy moving or rolling loads, as of late years many of the railways have taken down their cast bridges, replacing them with steel, not on account of rust, but their inability to stand the present heavy traffic.

Rolled iron joists were first made in 1849 by the Providence Works in Belgium; the invention, which was patented by them, was wholly theirs. The same works introduced the manufacture into France in 1850. No section of the kind has been made in England, and the first rolled joists used in this country were produced by the works just named, but I believe that soon after the invention was seen to be of so great a value, the Butterley Works, near Derby, laid down a plant and commenced rolling to a limited extent. In 1851 Fox and Barrett began to give up the use of cast-iron girders for their fireproof floors, and introduced rolled iron joists in their place, but it was not until 1865 and 1866 that the architectural profession took up rolled joists in a general way.

I may say in passing that the *Builder* had been about that time, and for several previous years, a strong advocate for the extended production of "rolled beams"; the late Mr. Godwin readily grasped the fact that there was a great future for their use.

On September 21, 1865, Mr. Zerah Colborn tested five rolled iron joists, and wrote such a favourable report upon the extraordinary and most unexpected resisting power of the beams, that architects thenceforward felt perfectly safe in adopting the working tables that were shortly after published, and based upon actual tests. Thus another invention gave a further and enormous impetus to the use of metal by architects in their buildings, because, not only are rolled joists pre-eminently suited for girders called "compound girders," to distinguish them from rivetted plate girders, but their use for lintels, floor beams, and even for roof rafters and stanchions is almost unlimited.

Without advertising any particular manufacturers, I may say that so far as my experience of some thirty-two years goes, there is no difficulty in obtaining good joists to a given specification either from the Continent or America. It is often asserted that any English joist is good because it is English; well, that is rather far from the fact. I have no preference for foreign manufactures; for my own work I use both English and foreign, as either best suits my requirements as to strength, section, expedition, and my client's or employer's pockets. Architects have been frequently misled by grossly exaggerated and inaccurate reports as to the foreign joists being so very inferior to English as to be untrustworthy. Of course, it must be admitted that large quantities of low-test steel joists, or what some people misname "builders' joists," are produced, which answer their purpose very well for ordinary domestic work, but for important buildings good medium test joists are equally obtainable.

One fact is sometimes overlooked when comparing the ordinary with the good joist, that from a point of strength they are equal practically, because the low test joist has so much more area of metal with which to do the work than the high test joist; the same reasoning would apply in determining the area of any girder, for instance—presuming you have a flange stress of 100 tons to provide for, and are content with a steel of 25 tons tensile value at one-fourth of the ultimate, you would require 16 in. of area, but if a steel at 30 tons was desirable you would only require 13.3 in. at the same factor of safety; then it becomes a

question of facility in obtaining the material and the cost.

There are three ranges of tests submitted by steel joist makers, viz.,—25 to 29 tons per square inch, 26 to 30, and 28 to 32 tons per square inch. After some experience in the use of all three, I have come to the conclusion that for important architectural works an average of 28 tons per square inch is quite high enough. If a test is exacted above this there is great risk of uncertainty and shortness, besides which the joist is frequently unworkable. The following tables give the result of some tests which have been made upon English steel joists rolled in January, and from which I have specified. The sizes range from 6 in. by 3 in. to 15 in. by 6 in. There were thirteen samples, all basic Bessemer.

The highest result was 31.04 tons.

" average " 29.73 tons.

" lowest " 28.9 tons.

" elongation 25.5 tons, but some of the

pieces were 10 in. by 6 1/2 in. long.

Ten of these joists were afterwards tested in lengths, and gave the following results:—

Section.	Span.	Load centre.	Deflection.	Permanence under test.
16 in. X 6 in. X 61 lb.	26 ft.	12 1/2	7 1/2	nil.
do.	do.	12 1/2	7 1/2	nil.
14 in. X 6 in. X 55 lb.	12 ft. 9 in.	6 1/2	23 1/2	nil.
do.	do.	6 1/2	23 1/2	nil.
do.	do.	20 0	37 1/2	nil.
do.	do.	20 0	37 1/2	nil.
12 in. X 6 in. X 32 lb.	20 ft.	11 1/2	22 1/2	nil.
do.	do.	11 1/2	22 1/2	nil.
12 in. X 5 in. X 36 lb.	20 ft.	11 1/2	18 1/2	nil.
do.	do.	11 1/2	18 1/2	16 in. bare

The loads marked with an asterisk denote the central safe loads indicated in the makers' book.

Another series of tests for specified joists, flats, tees, angles, and channels, produced by the Siemens' basic open-hearth process, gave the following results:—

20 tests on channels	highest	30.3
	average	28.6
	lowest	27.0
23 " rolled joists	highest	30.8
	average	28.9
	lowest	27.3
21 " angles	highest	31.0
	average	28.8
	lowest	27.5
23 " girder flats	highest	30.6
	average	29.3
	lowest	27.9
19 " tees	highest	31.2
	average	29.1
	lowest	27.6

The elongation on 8 in. averaged 29 per cent. and on the 10 in. " 25 per cent.

In consequence of a joist proving defective during working up I had it tested, with the following results:—

Ultimate breaking 32.56, an extremely high point; the length of test piece was 8 in., the elongation 25 per cent., and the contraction 48.9. The fracture was silky.

This being somewhat surprising I determined to have some drillings taken from the joist, and subjected to a chemical analysis, and which gave:—

Carbon	23
Phosphorous	69
Manganese	77
Sulphur	648

which is fairly satisfactory. The cold shortness arises possibly from a little excess of phosphorous, which should not exceed .06, and a rather high carbon, which always tends to invite atmospheric disturbance.

In one other doubtful case a foreign joist gave 30.3 ultimate with an elongation of 26.8, and contraction of 51.4, so that it seems there are instances when failure does arise although tests are up to specification.

Recent tests I have had on foreign steel joists and channels came out as follows:—

14 channels, highest	30.16
" average	28.95
" lowest	27.74
" elongation	27.1
" contraction	50.35
8 joists, highest	30.54
" average	28.99
" elongation	27.7
" contraction	50.93

If these results are compared with the first English table quoted just now it will be found

that the difference is scarcely expressible. The English is:—

Highest.....	0.65	above.
Average.....	0.74	"
Lowest.....	0.64	"

In the second table the foreign compares even more favourably.

In selecting joists the first thing to determine is whether one-third or one-fourth of the ultimate is to be adopted, then adopt about one-twenty-fourth of the span for depth of narrow flange joists, so that on 15 ft. the depth should be 8 in. For wide flange joists it is safe to work on one-twentieth to one-thirtieth of the span, hence a 12 in. by 6 in. or 12 in. by 6½ in. joist would carry its table load on 30 ft. At the same time it is impossible to have any rigid sort of rule; there are a hundred necessities of construction which drive an architect away from all hard and fast lines. A good proportioned joist is said to have its flange half its depth, and this works out very well up to the 12 in. or 14 in. sections, then the proportion goes altogether, because above 14 in. and up to 20 in. section the greatest width is only 7½ in. Another suggested proportion is of flange width to span, say one-twentieth to one-fortieth, which when taken with the previous depth proportion works out very badly, thus for a joist 35 ft. span at one-fortieth a flange would be needed 10½ in. wide, and the depth at one-twentieth would be 21 in. deep, a joist 20 in. by 10½ in. So much for some of the theory. In practice it is found that any of the deep section from 14 in. to 20 in. will carry their table load on 35 ft. without lateral movement. Seeing the impossibility of architects designing their own joists, they must necessarily use some approved standard make, but when rivetted girders, either compound or plate and angle, are needed, then the architect has some chance of designing as he chooses.

So far as construction goes, there is little in connexion with joists to remark upon, except, perhaps, as regards connections. The notched joggle is only suitable for light work. The forged set-up joggle is the most approved method for good work. The size of connecting cleats and number of bolts, of course, depend on the sections connecting; up to 12 in. deep two bolts high are usually sufficient, then three or four up to the 20 in. depth. The question of single or double cleating depends upon whether the loading is ordinary or heavy, and subject to movement. The greatest difficulty, I think, architects experience is in the want of a uniform "standard" for steel joists; especially in the case of competition is this useful, otherwise a competition becomes one only in name, and depends more or less upon the opinions and ideas as to what is "near enough" by the respective makers, entirely apart from recognised professional intelligence.

Just now I mentioned compound girders. These originated from the rolled joist. The pioneers of this invention were not long in finding out that joists would combine with plates and make very excellent girders at a less cost than rivetted plate and angle, and be equally effective. In 1866 Mr. Kirkaldy carried out, before a large assembly of architects, at which I was also present, a series of experiments upon some compound girders. These experiments determined the constants of the calculated tables which were published for this form of girder in the same way in which Mr. Fairbairn's values of 60, 70, and 80 for rivetted plate girders have become constants for his particular sections. Two examples will suffice to illustrate the results. The first was an 8 in. by 2½ in. iron joist—a very poor section—having a 6 in. by ½ in. top flange rivetted on; the weight of the section was 22 lbs. per foot, the span 20 ft.; with four tons on the centre there was no perceptible set; a load of five tons gave a deflection of ⅜ in.; at seven tons set increased to 4 in., but there was no fracture. Taking the area of the last flange at 1 in. we have:—

$$C = \frac{WL}{ad} = \frac{7 \times 240}{1 \times 8} = \frac{1860}{8} = 210$$

which latter figures become the constant in the formula:—

$$W = \frac{adC}{L}$$

The other girder consisted of two 8 in. by 2½ in. joists with a top flange 8 in. by ½ in.; 40 lbs. per foot, and 20 ft. long; 10 tons applied to the centre gave the slightest set; at 16 tons the register indicated ½ in.; and at 20 tons

signs of fracture appeared under the top flange.

The constant from the formula $C = \frac{WL}{SD}$ came out at 300, thus:—

$$\frac{20 \times 240}{1 \times 26} = \frac{4800}{26} = 300$$

So here we have a constant of 210 against 60 for single web rivetted plate girders, and 300 against 76 for a box girder. Of course, no abstruse calculation can possibly upset these results, astonishing as they may appear. As Mr. Kirkaldy says, "Facts, not opinions." The *Builder* of March 3, 1866, has an interesting report on the subject, and most of the leading papers of that week highly commended the new girder. Since Fairbairn's renowned girder no such important invention applicable to constructive arts has been brought out.

As compounds of multitudinous forms were originally composed of iron, so now are they of steel, giving a corresponding greater strength. I do not suppose any of us present at those experiments ever thought that such an enormous and world-wide use of compound girders, as we now find them to have obtained, was possible, side by side with rivetted plate sections. During my practice I have used this form of girder very successfully up to loads of 210 tons on 37 ft. As a rule, they are cheaper to make than plate and angle sections, and undoubtedly stiffer, having fewer parts and involving less rivetting. A double plate-box compound girder has four parts, whereas a plate and angle girder has eight parts; a 20-ft. section of the former needs 240 holes to rivet it together, and the latter 960 holes, involving 120 and 480 rivets respectively. The rivets in such a compound girder are usually of 8 in. pitch, whereas a plate and angle girder requires them to be not more than 4 in. pitch. I seldom adopt a 6-in. pitch for compounds unless they have more than three plates, as from a considerable number of tests I have made it is very evident that up to three plates an 8-in. pitch is ample.

Although next to cast iron in invention, I have reserved my remarks upon rivetted plate girders—which have been incidentally mentioned—so as to follow "compounds." An iron rivetted single web plate and angle girder was patented by Fielder & Baker in 1847 (illustration shown). It was proved to 150 tons on the centre and gave an inch deflection. In the same year it appears that Mr. Fairbairn also patented "hollow-box girders," a section which he formulated in 1846, but I cannot find any reliable information as to its exact form, nor of any lists on such a beam being carried out, although the section was undoubtedly the origin of the Britannia Bridge. These forms of girders have become perhaps the most important item in building and engineering works where timber is incapable of carrying the heavy loads which confront an architect in these days, when people will have big spans and few supports. The two most noted girder structures erected during the past fifty years are the Britannia Bridge over the Menai Straits, wholly of iron (it was opened in 1850), the greatest span of which is 460 ft., each girder weighing 1,600 tons; and the reconstructed Tay Bridge, which is wholly of steel, containing 51,000 tons and 6½ millions of rivets.

The single and double web rivetted plate and angle girders—I wish there was a short name for them—are the forms we are most familiar with. The only new feature in connexion with them arises from the use of steel having almost entirely replaced iron, thus bringing into use a new value per square inch. The four or five tons of the good old days for a working safe load, with iron of 16 tons to 20 tons tensile strain, or even Low-moor of 22 tons, are probably gone for ever, seeing that steel may be so readily obtained for the best girder work, equal to a safe load of 7 tons and more per square inch at one-fourth of the ultimate. Rivetted plate girders require the greatest care to skilfully design. Although theory is not always convenient to carry out with exactitude, yet all the parts of a girder should be theoretically calculated by graphics or mathematics, and (unless there are large quantities of sections required, warranting special rolling to sixteenths of thickness) the nearest size usually to be obtained, not less than the theoretical, should be adopted in execution; this condition greatly affects both cost and time for delivery. There should be no excess of metal in one part over another; there must be a perfect balance

of resistance to all the strains imposed by the load to ensure an economical girder. Depth is always a trouble to the architect, who is greatly hampered in this respect when designing girders; he wants all the head room possible. While a deep girder is cheaper, it may be considerably in the way, and it will cost a little more to case. On the other hand, a shallow girder is more costly, but there is less casing involved, and so oftentimes the extra cost is cheerfully endured.

Take a not very imaginary case of an internal cross wall carrying, say, the half of all the floors up and the roof: load, 80 tons; span, 30 ft. Engineers generally say that a twelfth to a sixteenth of the span is a proper proportion; this is a wide range, and there seems no absolute reason for it, except that a girder may be theoretically strong enough, while not in itself able to stand; on the other hand, it may be so shallow that it would defect of its own weight, although theoretically strong enough.

When not tied to depth I have generally for heavy loads adopted such a section as that the tons stress in the flange equals the load to be carried; this involves a deep girder, but usually a sufficiently stiff one, and at the same time it is economical. First, taking the above figures and applying Fairbairn's formula $\frac{WL}{SD}$ we get depth at one-twelfth of the span = 2½ ft. $\frac{40 \times 30}{4 \times 25} = \frac{1200}{10} = 120$ tons stress in the flange. If 28 ton steel is used at a quarter of the ultimate, $\frac{120}{7} = 174$ square inches will be required in the flanges, plus the loss for holes.

At one-sixteenth of the span = 186 ft. depth $\frac{10 \times 30}{1 \times 186} = \frac{300}{186} = 161$ tons stress

then $\frac{161}{7} = 23$ square inches, an excess of nearly 6 in. over the one-twelfth result.

Now by adopting the equality method the flange becomes considerably less, thus:—

Depth 3½ ft., or about one-ninth of the span, then $\frac{10 \times 30}{1 \times 35} = \frac{300}{35} = 80$ tons, which agrees

with the load, and the area required is $\frac{80}{7} =$

1143 square inches. The least depth, just determined at one-sixteenth of the span, is 186, say 1 ft. 10 in. on 30 ft., but I constantly meet with strenuous objections to such a depth, and am frequently obliged to reduce it to 1 ft. 6 in., which, with an 11 in. joist foot, would give a 9 in. projection below the ceiling. The result at this reduced depth is as follows:—

$\frac{10 \times 30}{1 \times 15} = \frac{300}{15} = 200$

then $\frac{200}{7} = 2857$ square inches. The present

approximate cost of a 30 ft. span girder would be:—

	£	s.	d.
For ⅓ of the span ...	31	7	8
For ¼ of the span ...	37	19	2
For the equality method ...	28	18	2
And for the 18 in. deep section	39	11	5

These examples prove the axiom that a deep girder is the most economical, but I think it is not possible practically, except under very unusual spans and loads, to adopt a deeper section than that arising from the equality method; as for small loads the girder, while theoretically strong, would not even be self-supporting. To illustrate this, suppose a 6 ft. depth was taken for the girder under consideration, the area required would only be 714 in., thus:—

$$\frac{10 \times 5}{1 \times 1} = \frac{50}{1} = 714$$

for which, after providing for rivet holes, two 3 in. by 3 in. by ½ in. angles and one 12 in. by ½ in. plate would be sufficient; but, by reason of its stiffness, it would scarcely maintain lateral stiffness; hence such girders are only suitable for use in strutted pairs, say for a footbridge or bridge-way. This depth of 6 ft., or one-fifth of the span, is not at all unusual or unreasonable, more particularly if the practice of American engineers may be cited; it is not uncommon for them to adopt one-sixth or one-seventh of the span as economical working. It may be considered that 7 is a rather high stress for safety for steel, seeing that the Board of Trade some years ago fixed 6½ tons per

square inch as the maximum for railway work; but, as I have previously shown by test results, with a uniform steel at 28 tons a quarter, or 7 tons per square inch is quite safe. Of course, if the steel is less than 28 the factor of safety must come down in proportion.

There is no difficulty in dealing with any evenly distributed load, but when there are concentrated loads and loads at various points—for instance, a division wall coming in at the centre of a main front girder, and loads also brought thereon by stout mullions or small piers—each load should be worked out separately to obtain an accurate result. It is most unwise to be content with a "rule of thumb" method, and especially so when heavy loads at various points have to be dealt with.

It would be impossible in a single paper to quote formulæ even for the more usual cases which arise, but with regard to central loads I may remind you that every ton so placed is equivalent to two tons distributed, and practically a dead centre load is bad for a girder. Where the flanges require more than one plate it is economy to shorten the remaining number to suit the varying flange stress, although, perhaps, in the case of two plates only it may cost nearly as much to bed up the thickness as the extra length of plate is worth; it is, therefore, entirely a matter within the architect's discretion, and apart from the necessities of construction.

The use of steel has considerably reduced the number of thicknesses of plates required in girded work, and so to some extent the cost of manufacture, transit, and fixing; for instance, a girder requiring a flange area of 50 in. in iron, involving the use of six 14 in. by ½ in. plates and two 4½ in. by ½ in. angles, would only require in steel four 14 in. by ½ in. and two 4½ in. angles. In light iron girders ½ in. thick webs were generally sufficient for ordinary girders when properly stiffened, but it is hardly economical or good practice to adopt less than a ½ in. web because of using steel, as the additional stiffening required would bring up the cost to more than if the ½ in. webs were adopted. The sectional area of the web required at 10 ft. from the centre is thus:—

$$a = \frac{w \cdot x \cdot y}{t} = 66 \text{ tons per foot of loading.}$$

$$\begin{aligned} 3 &= 10 \text{ ft. from centre.} \\ 5 &= \text{Safe load per square inch.} \\ \frac{66 \times 10}{7} &= 38 \text{ per square inch.} \\ \frac{38}{14} &= 27 \end{aligned}$$

14 is the height of the web in inches between the flanges, 27, or say ¼ in., is the theoretical thickness. But on looking at the section it will be manifest that so thin a web for such a height will require considerable stiffening (notwithstanding the angles) by means either of packed stiffeners, as shown by red lines, or with bracket stiffeners, as shown by blue lines, Nos. 8 and 9.

I seldom use a web less than ¼ in. thick except for very light work. A ¼ in. web requires less stiffening, and affords a greater chance of uniformity throughout; there are no changes of thickness. A sufficient metal is provided in the ends for shear without additional stiffeners. Moreover, now that it is possible to obtain flats up to 40 ft. long without much delay or serious expense, uniformity of web enables some of the longest girders to be constructed with one flat, which is a very great consideration, not only as regards workmanship, but effectiveness of the girders. Similarly, the angles and flats forming the flanges may be in one length, so that a girder of large dimensions may be constructed without a single cover plate or angle cover anywhere in its length. Girders thus made up will give a high result under actual test. I have had no opportunity myself of testing very large girders, but I have many ordinary ones, say up to 200 tons, and have found a considerable approach to the results already mentioned, as derived from the compound sections.

All steel beams have a perceptible deflection under their full load, unless, of course, they are clumsily and extravagantly designed. Some specifications stipulate that there shall be no deflection whatever; this is absurd, for, in addition to other tests, deflection should be specified at the usual limit of a good girder, not exceeding ¼ in. to each foot of span. A relatively shallow girder, even if strong enough, will always have a greater tendency

to deflect than a deeper one; hence depth is so important a factor in design. With regard to rivets in constructional plate and angle girder work, generally speaking a 4-in. pitch is the most efficient, but sometimes when there are an unusual number of plates or joints to be secured a 3-in. pitch is desirable. A great deal depends upon whether the holes are punched, broached, or wholly drilled. All rivets should be of mild steel, and specified to stand 24 tons to 28 tons per square inch, to double bend hot or cold without fracture, and to stand the head being hammered out when red hot to three times the diameter of the rod without splitting. Some rivets which I have had tested recently gave the following results (Tables 1 and 2):—

Rivets ¾-in. diameter, 3½-in. long (under head).

Original.		Ultimate Stress.		Fractured.			Stress per sq. inch of Fractured Area.		
Diameter.	Area.	Total.	Per sq. inch of original area.		Dia.	Area.		Difference.	
			lbs.	lbs.				Area.	Per cent.
incb turned.	sq. in.	lbs.	lbs.	lbs.	incb.	sq. in.		lbs.	
•566	•252	15,070	59,800	61,538 = 27 tons.	•35	•006	•156	61.9	
•566	•252	15,518	61,530	Fracture Silky.	•34	•001	•161	65.9	
•566	•252	15,950	63,204		•35	•006	•156	61.9	

Table 1.

SHEARING.

Rivets ¾-in. diameter, 3½-in. long (under head).

Original.		Total Stress.		Double Shear.		Single Shear.	
Diameter.	Area.	lbs.	lbs.	Per square inch.		Per square inch.	
				lbs.	lbs.	lbs.	lbs.
incb.	square inch.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
•74	•430	35,869	83,477	82,767 = 17 tons	41,738	41,738	41,738
•74	•430	34,659	80,331	82,767 = 17 tons	40,250	41,333 = 18.5 tons	41,333
•74	•430	36,225	84,244	84,244	42,122	42,122	42,122

Table 2.

Steel Bar 14 in. by ¾ in.

Original.		Ultimate Stress.		Fractured.			Extension.		Appearance of Fracture.	
Size.	Area.	Total.	Per sq. inch of original area.	Size.	Area.	Difference.	Stress per sq. in. of Fractured Area.	Inch. p. c.		
								Area.		p. c.
in.	sq. in.	lbs.	lbs. tons	in.	sq. in.		lbs.			
1 23/4 x 7/8	910	62,200	68,352 = 30.5	1 15/16 x 7/8	793	•117	78,436	•116	•116	

Table 3.

As an instance of the vagaries of steel manufacture, I may mention that last month amongst some steel plates, all rolled at the same time and which were specified at about 30 tons tensile, we found one, a 14 in. by ¾ in., which worked very badly, and upon testing it the reason was apparent, as above (Table 3).

Instead of a contraction of 12.8 and an elongation of 11.6 there should have been about 45 and 22 respectively on 10 in.

In addition to tensile elongation and contraction tests it is as well, with very important work, to specify that a steel plate shall stand a number of holes being punched ¼ in. apart without breaking the metal between, as the samples on the table.

With regard to the thickness of plates, it is desirable not to exceed ¼ in. or ½ in. in a general way, because it is held that plates less than 1 in. thick give a better test than plates of more than 1 in. thick, and principally because the same work in rolling cannot be got upon thick plates as upon thin ones. I cannot do better than quote the words of Mr. Dicks (an eminent Scotch engineer) on the subject of carbon and thick plates:—

"In rolling metal down to a thin plate, say to ¼ in. or ½ in. thick, the molecules, if they have long dimensions, seem to have their long dimensions laid closer together; their centres of attraction are in the closest possible position, and therefore the plate has a higher tenacity for the same material. In a thick plate it is impossible to obtain this closeness, although I must say I have not been able to detect by careful experiments any difference in

the density between a thick and thin plate; still the appearance of the fracture is different.

A steel plate ¼ in. thick, to stand a tensile test of say 27 tons to the square inch, would require about 0.15 of carbon per cent. If that piece of steel were rolled into a plate of 1 ¼ in. thick it would probably break at about 25 tons per square inch. On the other hand, if a piece of steel 1 ¼ in. thick is wanted to stand 32 tons per square inch, in my opinion it must have carbon from 0.22 to 0.24 per cent. A plate with, say, 0.22 of carbon per cent. rolled down to a thickness of ¼ in. or ½ in. would break at something like the stress the fractured plate showed, somewhere in the region of 40 tons to the square inch.

Machine riveting is much in vogue, both pneumatic and hydraulic, to ensure good work,

as it is said, and a greater output; but, from experience, I find that the process requires quite as much looking after as hand riveting and the result is quite as uncertain, if there is any uncertainty at all. In any case there are numerous instances where machine riveting is not possible, so that hand riveting must still be in use. I shall no doubt be anathema if I say I have a strong leaning towards good sound hand riveting, though I candidly admit that, as regards numbers driven, speed, and cost, the machine work is not to be surpassed.

The warren, lattice, strut and brace, and kindred forms of steel girders, architects occasionally find of great service, but they are not girders altogether suitable for heavy loads in ordinary buildings, and their construction does not call for any special remarks, as the formulae adopted for iron equally applies to steel, the only variation being in the safe load per square inch, which I have before stated is 6 tons or 7 tons instead of 4 tons or 5 tons.

The use of steel for almost every form of roofing has also greatly increased, and is now supplanting the timber roof, except where such is required for appearance or to meet a prejudice; but I think there is no reason why roofing may not be still more generally adopted instead of wood; the forms available are so numerous that an architect's requirements can be readily complied with in ordinary sections. Steel enables the construction of very light trusses or principals, which up to 60 ft. or 70 ft. span can be easily lifted completely

framed the same as a wood principal, and when flush and level ceilings are necessary, a horizontal tie, formed with a \perp or two angles \perp will afford proper fixing for the ceiling joists, and there is no difficulty in giving the tie any other form to suit an elliptical, segmental, or coved ceiling. The pitch of a roof, however steep, is no impediment to constructing a sufficiently rigid steel principal, always providing that the calculations are correct. Illustrations Nos. 23 and 24, to a $\frac{1}{2}$ -in. scale, are two examples of what has been done in this direction. Steel joists, too, offer a most economical means of forming roofs without principals, and of constructing roof principals in such a way that the tie, being a joist, may carry the rafter ceiling joists, and also afford ample storing room above (illustration No. 4). The ordinary struts, as such, and braces, are wholly unnecessary, it only needs for the connections of the uprights and rafter joists to be ample and secure to ensure a perfectly rigid truss; so that, with principals of steel joists to 40 ft. span, and purlins of steel joists, even of 40 ft. span—which I have recently adopted—between brick or stone gables, interior party walls, or between principals, the use of wood may be almost entirely avoided. Such a construction should be most favourably viewed from a "fire-resisting" point, as the less there is to burn the less risk is there of a big fire. In the case of mansard roofs of two or more stories, steel joists afford very great facilities of construction, and are convenient when the slopes and sides have to be concreted. The floor joists form ties to the base of the sloping rafters, and the upper floor joists act as struts. The sloping rafters also become stanchions, and may usually be in one length (illustration shown).

Of course, I might expand this subject to an unlimited extent, especially in the region of steel roof construction. I feel that I have trespassed very much upon your time, and yet have only touched upon a few constructive questions with which you have to deal in your every-day routine. Steel is no doubt yet in its infancy, and there must be a great development awaiting it in the near future, especially with regard to its usefulness in building construction; and the adaption and application of constructional steelwork is one of the most important branches of his art that the architect of the near future will have to face.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting (business) of this Institute was held on Monday, Mr. E. A. Gruning, vice-president, in the chair.

Messrs. Butler Wilson (President of the Leeds and Yorkshire Architectural Society) and R. Stephen Ayling, attending for the first time since their election as Fellows, were formally admitted, and signed the register.

A recommendation of the Council, that Mr. Wm. Emerson, President, be requested to allow himself to be nominated as President for the ensuing year of office, was adopted, and consequently By-law 26 was suspended.

[By-law 26 states that—"No President who has filled the office for two successive years (Mr. Emerson has been President since June, 1899) shall be again eligible for the Presidency until the expiration of two years from the termination of his tenure of office." But the 33rd section of the Charter gives power to a general meeting to suspend a by-law by resolution of the Royal Institute confirmed at a subsequent general meeting, held not less than seven and not more than twenty-eight days after the former meeting.]

The alterations in the Institute form of contract proposed by the Council were sanctioned subject to slight verbal amendment.*

Mr. William Woodward gave notice that he would ask the Council to convene a special general meeting at the earliest possible date for the purpose of considering a resolution urging that "the proposed memorial to Queen Victoria should be open to the competition of all British (including Colonial) architects, sculptors, and artists."

The meeting then terminated.

The eleventh general meeting (ordinary) of the session will be held on Monday next, when a paper on "The Classifications of Romanesque and Gothic Architecture" will be read by Mr. Francis Bond, M.A.

THE SURVEYORS' INSTITUTION.

A MEETING of this Institution was held on Monday at No. 12, Great George-street, Sir J. Rolleston, M.P., presiding.

THE RATING OF PUBLIC-HOUSES.

The minutes having been read and confirmed, Mr. Walter C. Ryde, barrister-at-law, read a paper on "The Rating of Public Houses." After touching on the question of monopoly as influencing rent, Mr. Ryde admitted that trade, or the profits of trade, as such, could not be rated, but said that rateable value was the rent which might reasonably be expected, and the question was, would the existence of a trade, or the possibility of carrying on a profitable trade upon the premises, increase the rent which might reasonably be expected? If it would, the rateable value must be increased accordingly. In treating of the question of personal goodwill, Mr. Ryde said that if the outgoing tenant could take away all his customers, the new tenant would be starting a new business; if the outgoing tenant could take away none, the new-comer would have the benefit of all the existing trade. Whether the rent would be smaller or larger depended entirely upon the way in which this question of fact must be answered; and this was a question for surveyors and not for a lawyer to answer. In the case of a tied house, it was plain that if the tenant paid more for his liquors than a free tenant would the extra price must be regarded as forming part of the true rent. The rent, therefore, paid for a tied house did not assist the valuer, unless he knew what the tenant was paying to his landlord in the shape of extra prices for the liquor he bought.

A vote of thanks was passed to Mr. Ryde, on the motion of Mr. Marshall, K.C., seconded by Mr. W. Eve.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.

ANNIVERSARY OF THE INCORPORATION.

A DINNER was held at the Trocadero Restaurant, Piccadilly Circus, on Monday evening to celebrate the second anniversary of the incorporation of this Institute. The chair was taken by Mr. J. D. Crace (President). Among those present were Mr. M. C. Cowtan (Vice-President of the Institute and Master of the Painters' and Stainers' Company), Mr. W. Rowe (Past-Master of the Painters' Company), Mr. R. J. Bennett (Glasgow), Mr. W. Pitman (Treasurer of the Institute), Mr. J. C. M. Vaughan, Mr. T. H. Pritchard (Clerk of the Painters' Company), Mr. F. W. Englefield (Secretary), Mr. Henry Gibson (Dublin), Colonel R. J. Bennett (Glasgow), Mr. Rowland Plumbé (Past-Master of the Painters' and Stainers' Company), Mr. W. G. Sutherland (Manchester), Secretary of the North of England Master Painters' Association.

After the loyal toasts, Mr. Pitman proposed "The Imperial Forces," for which Colonel Bennett responded.

The President gave the toast of the evening, "The Incorporated Institute of British Decorators." He thought the Institute had great possibilities. The first possibility it had was that of bringing into touch with one another those minds which were interested in the same subject, and that subject their beautiful craft. The craft of decoration admitted of almost illimitable extension and certainly refinement. Those who had recently made the journey, promoted by the Institute, to Italy had seen for themselves how art decoration might reach a high artistic ideal. But it was not only the advantage of rubbing shoulders at the social board that they had to look at, but the bringing together of men who were in every-day business competitors. It was possible for this Institute, through written and unwritten laws, to bring about a far more dignified and honourable relationship between man and man than could be otherwise attained. Then there were also many points in which the exchange of expert opinions one with another would have a wholesome effect. They were, he was afraid, apt to move in grooves. It was a most disappointing thing in their craft to see men satisfied with what already existed rather than aiming at something very much more studied and artistic in its result. There was no short road to success in art; it was rather by a constant endeavour to do better that the highest ideal was attained. He had reached that age when there was great reason for fancying that it was not necessary to go on

studying, but he confessed that he did not take that view, and it was with the greatest delight that he renewed his acquaintance recently with those splendid examples of the decorators' craft in Italy.

Mr. Sutherland gave "The Painters' and Stainers' Company." The guild, he said, held a charter dating back to the reign of Queen Elizabeth, and it had not only fulfilled its mission in the past, but had shown, by its more modern activities, that it was devoted to the task of lifting the craft to a higher level and inspiring it with loftier ideals. The success of the Incorporated Institute of British Decorators was due in a great measure to the stimulus given by the Painters' Company.

Mr. Cowtan acknowledged the toast, and gave the Institute the heartiest welcome on the occasion of holding its annual meeting at the Painters' Hall.

Mr. Sitwell proposed "The Health of the Chairman," remarking that their craft had been passing through a crisis from which it must emerge either in triumph or drop into insignificance. Personally, he regarded the Institute as having come upon the scene just at the right moment to achieve the triumph and to elevate their craft to the position of a profession. Hitherto their craft had been included among the despised and rejected occupations, but they need only inspect the great works at Florence to receive enlightenment as to what high ideals decorators could attain. The Institute was getting stronger from month to month, and would soon, he hoped, reach a stage of robust manhood.

The President's brief reply concluded the toast list.

THE ANNUAL MEETING.

The annual general meeting of the Institute was held at the Painters' Hall, E.C., on Monday afternoon, when the following officers were re-elected:—President, Mr. J. D. Crace; Vice-presidents, Messrs. M. C. Cowtan, J. C. M. Vaughan, R. J. Bennett, Hy. Gibson, and J. F. Barter. Five members were also elected to the General Council. The Treasurer (Mr. Pitman) and the Secretary (Mr. Englefield) were also re-elected. An account was given by the President of the year's work, reference being made to the instructive lectures given at Painters' Hall, particularly that by Dr. G. Williamson on fresco painting. It was also mentioned that some fifty decorators had been admitted as Fellows during the past twelve months, bringing the strength of the Institute, in all classes, up to 350, which included leading members of the craft of decorators in Great Britain and Ireland.

THE SANITARY INSPECTORS' ASSOCIATION.

At the meeting of the Sanitary Inspectors' Association, held at the Carpenters' Hall, E.C., on Saturday, Mr. T. C. Dee introduced for discussion the subject of "The present position of the sanitary inspector." Mr. W. West occupied the chair.

Mr. Dee said he was of opinion that the tenure of the sanitary inspector under the Public Health Act, 1896, was all that could be desired, and all the powers to deal with nuisances that they could possibly wish for were to be found in the same Act. If, therefore, the law was so satisfactory, why were inspectors anxious for better results in the work done for the advancement of the public health and more satisfactory position for themselves? Was the administration defective? He thought it must be accepted that certainly the tenure of office might be much improved if the Local Government Board could be induced to administer it in as liberal a spirit as had been done with respect to district medical officers of poor law unions. He regarded the present administration of the law as detrimental to the true interests of the public by leaving the sanitary inspector's position liable to be taken from him in consequence of a due fulfilment of his duties when it was against the personal interest of his direct employers. Again, the local sanitary authorities were at times very diffident in enforcing all the powers they possessed. He would only instance one form of this, that was the carrying into effect of the penal clauses of the by-laws of the London County Council with reference to water-closets and soil-pipes. The law was enormously strong and very clear—some might say too strong and too clear—yet they all knew that it was very frequently not fully administered.

* See our issue for April 6.

And what an unsatisfactory position for the sanitary inspector, who by the direct order of the Local Government Board reported such breaches, to find that he was unable to do anything, the strong law notwithstanding! Again, the taking from the sanitary inspector of the control of sanitary works in progress in his district prevented him from deriving full fruition of his work. For these and other reasons he submitted that the administration fell far short of what might be reasonably expected. Replying to a second query—"Is the present position due to the sanitary inspector himself?"—Mr. Dee pointed out that many of them were originally connected with the building trade, and with the widening of the opportunities of studying science opened up during the last quarter of a century their eyes were opened to the wisdom of acquiring something more than a rule-of-thumb knowledge of their handicraft; and by the knowledge they gained, coupled with the great opportunities they possessed of applying those scientific theories to the rising science of public health (hygiene), they were naturally led to prepare for a position such as they now hold. Again, many of them gained their first conception of the duties of their position in the office of a sanitary department, which was followed up by a practical application of the theoretical knowledge as a junior inspector in some provincial town, under the guidance of those who had passed many years in a similar position. They knew of a good many instances of successful inspectors who had attained better posts in consequence of their qualifications, and they were animated by a lively spirit of emulation to study hard, to work with intelligent interest, that they might likewise succeed. He urged that they must guard themselves in their dealings with their brother inspectors, holding at least that those inspectors were carrying out their duties as well as they were; and even if they could not fairly think this in every case, let them minimise their own personal light for the glory and welfare of their profession as a body. Professionally they were all brethren, and he urged them to leave the position of the workman and his foreman and rise to the professional dignity of colleagues. Having suggested a theoretical unity, he would point out a practical application of this merging of one's personality in the general welfare of the body that could easily be made—that was, they should be able to take up one or other of the undoubted hardships that sanitary inspectors met with; and, for instance, when a man lost his position, or was in danger of losing his position because he did or wished to do his duty, their Association, instead of being compelled to advise him to compromise with his authority until he had obtained another post, would be able to investigate the case, advise him how to act, and obtain wide publicity for his and his associates' actions. If, notwithstanding this, he lost his post, the honour of the whole body could be vindicated without loss to him, for they should support him (and thank him for the opportunity he had given them) until he was again acting for the good of them all and in the real interest of public health by a further fearless discharge of the duties of his honourable post as a worker for the advancement of health for his fellow-countrymen. He would urge them to aim high and say as a body, "We will do more than command success: we will demand it."

A discussion followed, and at the conclusion a vote of thanks was accorded to Mr. Dee.

COMPETITIONS.

HINDLEY DISTRICT COUNCIL OFFICES.—The first premium in the competition for these offices has been awarded to Messrs. Heaton, Ralph, & Heaton, architects, Wigan. The cost of the buildings will be about 7,000l. The competitors numbered between seventy and eighty.

DUNFERMLINE BATHS AND GYMNASIUM.—The sum originally offered by Mr. Carnegie to build and equip at Dunfermline the baths and gymnasium was 20,000l. Competitive plans were sent in and it was found that in every case the probable cost exceeded the sum at the committee's disposal. Mr. Carnegie has since agreed to increase the amount he had offered for the construction and equipment of the proposed buildings, so that the committee might be free to choose the design which they thought most suitable; but he relies on the

committee satisfying themselves that the accommodation to be provided, while ample, should not be in excess of the probable future requirements of the town, and that there should be no expenditure on needless display. Mr. William Reid, the secretary, was instructed to invite Mr. H. J. Blanc to meet the committee. The premiums offered to competing architects were awarded as follows:—First (50 guineas), Mr. Andrew Muirhead, Dunfermline; second (30 guineas), Mr. David Barclay, Glasgow; third (20 guineas), Mr. James T. Scobie, Dunfermline. The town is providing a site for the new buildings at a cost of 4,000l.

VILLAS AND COTTAGES, DUDLEY.—The result of a recent competition for villas and cottages, Dudley, is as follows:—10l. premium divided as follows:—Premium: Best design for villas—Mr. A. Ramsell, Dudley; best design for cottages—Mr. H. A. Reynolds, Birmingham. Highly commended designs—Mr. A. Gammage, Dudley; Mr. H. Phipps, Brierley Hill. Commended designs—Mr. Thos. Silver, Handsworth; Mr. Jordan Green, Handsworth; Messrs. Perry & Nightingale, Dudley; Mr. S. O. Pennington, Wolverhampton.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held at the Westminster Palace Hotel on April 12, the chairman, Mr. Percival Marshall, presiding, a paper on "Iron-lined Tunnelling Construction" was read by Mr. A. Woodroffe Manton. The author made reference to the visits which the members had paid to the works of the Central London Railway, and to the City and South London Railway Northern Extension Works, and also alluded to other shield-driven tunnels which had been constructed in England and on the Continent previously to those. The general details of the Greathed Shields were described, likewise modifications to increase the rate of progress of the work. Special types of tunnelling shields were dealt with, the most economical design of the shield chambers, both initial and terminal being discussed. In this connexion the ingenious hooded shield, invented by Mr. Dalrymple Hay and used on the Waterloo and City Railway, was introduced. Plant for air-compressing (for ventilating, grouting, and shield advance) winding, pumping, lighting, and traction was described, and particulars given of the speed of tunnelling which had been attained. Boring or excavating machines, as used in conjunction with a shield, were referred to and illustrated, the most successful being Thomson's Bucket-ladder machine, which had been employed in the construction of the Central London Railway. Proposed designs for rotary and chain-cutter boring machines were shown, and their relative advantages considered. Illustrations of special plant for the driving of iron-lined tunnels were exhibited, and the author indicated the conditions under which each design would probably give the best results. A discussion followed the reading of the paper, and a vote of thanks was accorded the author. On the following afternoon, April 13, the paper was supplemented by a visit to the Great Northern and City Railway Works, through the courtesy of the engineers, Sir Douglas Fox and partners, and of the contractors, Messrs. S. Pearson & Son. Mr. B. Everett and other gentlemen showed the members over. The surface machinery was first seen, and the system of removing the excavated material explained. Raised from the shaft at Poole-street, New North-road, it is taken away *via* the Regent's Canal and used for filling up an old East London Waterworks reservoir, situated in Victoria Park. The line runs from Moorgate-street to Finsbury Park and consists of five and a half miles of double tunnelling. The party walked to the working face, where they were shown the shield under actual driving conditions, a gang of workmen having been specially kept to go through all the various operations for the members' benefit. The outside diameter of the shield is 17 ft. 4½ in., and to drive it forward is fitted with sixteen hydraulic rams, each 7 in. diameter, the working pressure being two tons per square inch. It is expected that the tunnelling will be completed by September next.

THE EXHIBITION OF MODERN ILLUSTRATION.—This exhibition, now being held in the galleries of the Indian Section of the South Kensington Museum, in Imperial Institute-road, will close on May 4.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—The annual meeting of the Sheffield Society of Architects and Surveyors was held on the 11th inst. in the School of Art. The chair was occupied by Mr. Joseph Smith. Mr. J. R. Wigfull and Mr. J. B. Mitchell-Withers having been elected as Fellows of the Society, an alteration of the rules was agreed to, with the view of strengthening the Council. Mr. W. C. Fenton presented the financial statement, which showed that the receipts for the year amounted to 210l. 10s. 7d., and that there was a balance in hand of 99l. 4s. 6d. Mr. Fenton read the fourteenth annual report of the Council, which stated that the membership was 112, as compared with 109 last year, and continued that as the library accommodation was very limited, the Council had appointed a sub-committee to go into the question of providing better accommodation. After a lengthy consideration of the subject, the committee had recommended that a room in connexion with the Literary and Philosophical Society's premises should be taken. The question of a proposed competition in connexion with the Norfolk Market Hall, and the Royal Institute of British Architects' suggestions with regard to competitions, were sent to the Chairman of the Finance Committee, who promised that due consideration should be given to them. The Council had to regret, however, that the draft conditions which were submitted to them were not satisfactory in several respects, and had intimated to the Finance Committee that in their opinion the competition was not at all necessary for this building, and that the architect from whose hands it had previously received attention should have been consulted on the matter. The Health Committee of the City Council had resolved "That the City Surveyor be instructed to prepare conditions and obtain competition plans for the erection of a building on the surplus land at the junction of Angel-street and King-street for the occupation by selected small householders in the upper portion, and salesshops on the ground floor and base-rooms underneath." The minutes of the Health Committee were not confirmed by the City Council, but on February 14 Alderman Styling succeeded in getting the appointment of a committee to prepare a scheme for the site. It was understood now that the idea of a competition had been abandoned. The City Council had decided to take over the School of Art from August 1 next, and it was hoped that this change would have the effect of procuring better facilities for the Society than had hitherto been the case. A resolution expressing the Society's satisfaction at the City Council's action had been passed. A letter had been sent to the Town Clerk in regard to the proposed action of the Plans Sub-Committee for the Highway Committee to restrict the construction of area lights in footpaths. The letter pointed out that up to the present the Society had no intimation that area lights were objected to by the Corporation, and they were unable to ascertain that any resolution had been passed by the Highway Committee of the City Council in regard to this matter. They considered that some formal intimation should have been given to the architects of Sheffield before the Corporation changed their policy. The proposed prohibition of area lights was a serious matter affecting the value of property, both to owners and ratepayers of the city. The prevention of area lights would depreciate the value of building sites already acquired on the supposition that such lights would be allowed as previously had been the case, and it would considerably reduce the ratable value of the property. Area lights of the maximum projection, if properly constructed, constituted no danger or inconvenience to the public, and most of the important towns did allow them to be constructed under proper regulations. This had been considered by the Highway Committee and referred to the Works Sub-Committee, upon whom a deputation from the Society had attended. The Sub-committee had delegated the Chairman, Vice-Chairman, and City Surveyor to meet the deputation at a future date, and discuss the matter in detail. The Chairman, in moving the adoption of the report, said although they had not proclaimed on the housetops the work they had done for the profession, yet a study of the report would show they had done their very best to serve the interests of the profession

and of the city.—Mr. P. Marshall seconded, and the report was adopted.—The Chairman referred to the limited character of the competition for the National Memorial to Queen Victoria, and called attention to the fact that there is a movement on foot to get the matter altered.—Mr. H. L. Paterson expressed the opinion that such a competition ought to be open to the whole of the British Empire, and he moved a resolution that that opinion be conveyed to the Royal Institute of British Architects.—Mr. C. M. Hadfield seconded, and the resolution was adopted.—On the motion of Mr. W. J. Hale, a hearty vote of thanks was passed to the officers and members of the Council for their services during the year, and in reply the President said it had been a pleasure to him to do his best to serve the interests of the profession.—The following officers were then elected by ballot: President, Mr. Peter Marshall; vice-president, Mr. Thomas Winder; treasurer, Mr. Frederick Fowler; secretary, Mr. W. C. Fenlon; members of the Council, Messrs. J. R. Wigfull, R. W. Fowler, C. Hadfield, J. B. Mitchell-Wibbers, E. M. Gibbs, H. L. Paterson (Fellows), C. B. Flockton, C. F. Innocent, and C. M. Hadfield (Associate members).—Mr. Gibbs expressed his intention of retiring, on the ground that new blood was required, and the next on the list, Mr. Edward Holmes, was put in his place. The President presented the Society's prizes to Messrs. H. W. Inolt and J. Miller, and it was then announced by Mr. Joseph Smith that in future the Society would have a home of its own, arrangements having been made to take a room in the building of the Literary and Philosophical Society.

BRISTOL SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held at the Fine Arts Academy, Queen's-road, Clifton, on Monday last, Mr. G. H. Oatley, Vice-President, in the chair. The scrutineers for the conduct of the election reported to the meeting that Mr. Frank Wills had been elected President, Messrs. W. L. Bernard and G. H. Oatley Vice-Presidents, and the Hon. Secretary, Mr. H. Dare Bryan, was unanimously re-elected. The following gentlemen were the members of the new Council:—Messrs. La Trobe, Nicholson, Silcock (Bath), Skinner, Joseph Wood, and J. Foster Wood; and Messrs. Green (Bath) and J. Cyril Thompson Associate Members of Council. The annual report and balance-sheet presented by the Council were, upon the motion of the Chairman, seconded by Mr. J. Cyril Thompson, taken as read and adopted. From the Report we learn that the Society now numbers twenty-three Fellows (the same number as last session), twenty-nine Associates (a gain of one over last session), and only nine students, as against twelve last session. In view of the small number of student members the Council again emphasise the point that appeared in last year's Report, that members of the Society should do all in their power to encourage their pupils and junior assistants to join the Society. Two new Fellows have joined the Society, three Associates, and one student member. Attention is drawn to the new clause of Honorary Associates eligible for election to the Society. The by-law runs that Honorary Associates "shall be persons not professionally engaged in practice as architects, who, by reason of their ability in art, science, literature or archaeology, or their experience in matters relating to architecture, surveying, engineering, or any of the arts or crafts connected with architecture or building, may appear to the Council to be able to render assistance in promoting the objects of the Society." The Council record with regret the death of Mr. William Bruce Gingell, in whom the architectural profession in Bristol has lost a much respected practitioner, and the members of the Society one of their oldest colleagues.

PRIMITIVE METHODIST CHURCH, SWINDON.—A new Primitive Methodist church has been recently opened in Rodbourne-road, providing accommodation for 400 persons, and new classrooms erected, the old chapel being utilised for schoolroom. The building, which is Gothic in style, has been built with red pressed bricks for face and Bath stone dressings, and covered with blue slates. There is a large oriel window in front gable. The interior is seated in pitch-pine, and the rostrum and roof principals are also of this material. The windows are filled with stained glass. Mr. R. J. Leighfield, of Swindon, was the builder, the contract being 1,151l. 10s., and the architects were Messrs. William Drew & Sons, of Swindon.

Illustrations.

SMALL COUNTRY HOUSES.

THESE houses have recently been built for various clients—in almost every case in accordance with some expressed wish as to plan or special treatment. They should, therefore, be taken not so much as examples of what small houses ought to be as illustrations of what an architect has to build in every-day practice. The cost varies, of course, with locality, and still more with the amount of internal finish. In two or three of the larger examples wainscot panelling and oak floors, elaborate door furniture, and enriched plaster will drive the cost up to as much as 2s. per foot, whereas the more modest examples average perhaps 10d., and in some cases the cost has come out at 8d.; but present-day prices hardly permit of this being a common occurrence. The cottages come out considerably less, only, however, because a much less high standard of finish was required. There seems, generally speaking, so little difference in cost between good and second-rate material that even in humble dwellings it is hardly worth while to specify the interior. Economies in labour and fittings go far further in reducing cost than savings on the structure or carcass. All the examples are brick and tile except the house "Manston," which is finished in rough cast and small, thick Westmorland green slates, and "Toy's Hill." This is built with the local stone, with Howley Park stone where the labours are elaborate. The drawing is exhibited at the Building Trades Exhibition.

ARNOLD MITCHELL.

HOUSE AT CROWBOROUGH: THE DINING-ROOM.

THIS drawing, which was exhibited at the Royal Academy of last year, shows one of Mr. Baillie Scott's now well-known and characteristic examples of decorative treatment of the interior of a room; keeping the lines of general structure and furniture very simple and severe, and depending on coloured decoration for decorative effect. Unfortunately we cannot reproduce the colour, but those who are familiar with Mr. Scott's coloured drawings will be able to picture the effect to themselves.

THE EASTER SEPULCHRE, HAWTON-BY-NEWARK.

HAWTON CHURCH is situated about two miles from Newark, and externally is not a very interesting church. On entering, one is surprised to find such a fine piece of work as the Easter sepulchre, here illustrated, which is built of a rich yellow sandstone. On the opposite side of the chancel are sedilia of similar character to the sepulchre.

At Heckington Church, in Lincolnshire, there is an Easter sepulchre resembling this one very much, but greatly inferior in design and workmanship.

J. H. R.

PROTECTION OF BUILDINGS FROM LIGHTNING.

A COMMITTEE, to be known as the Lightning Research Committee, has been organised by the Royal Institute of British Architects and the Surveyors' Institution, with the object of collecting and tabulating information from all parts of the country as to damage resulting to buildings from lightning-stroke. The Committee owes its inception to Mr. Killingworth Hedges, who, in his paper on "The Protection of Public Buildings from Lightning," read before the Institute of Architects last year, referred to the difficulty experienced by experts in getting accurate information as to injuries sustained by lightning-struck buildings, and urged the desirability of an inquiry by a recognised authoritative body as to how far buildings are rendered lightning-proof by modern systems of protection. The Lightning-Rod Conference, as the result of an exhaustive inquiry extending over three or four years, drew up and published with its report in 1882 a code of rules for the erection of lightning-conductors, which has served practically as a text-book on the subject up to the present time. Since the general adoption of these rules, however, no certain information has been collected on the effect of lightning-strokes on buildings

provided with conductors. The present inquiry, therefore, by the collection of precise data, may serve to test in some measure the results accruing from the rules laid down by the Lightning-Rod Conference nearly twenty years ago.

The Committee includes Mr. John Slater (chairman), Major-General E. R. Festing, C.B., F.R.S., Dr. Oliver Lodge, F.R.S., Messrs. J. Gavey, W. P. Goulding, W. N. Shaw, F.R.S., H. H. Statham, A. R. Stenning, Arthur Vernon, Killingworth Hedges, C.E. (Hon. Secretary).

In pursuance of their inquiry the Committee seek the co-operation of competent observers in all parts of the country, with a view to obtaining accurate details, noted on the spot, of the effect of lightning-strokes on buildings, whether fitted with conductors or not. A schedule of questions will be sent to persons willing to act as observers, who will be requested to investigate any disaster from lightning occurring to a building in their neighbourhood, and to furnish the Committee with the details suggested in the questions. Should additional particulars be desired, such as measurements, &c., the observers will be requested to make further investigations, and any reasonable expenses will be defrayed by the Committee.

Persons willing to assist by their observations are requested to communicate with the Secretary to the Committee at the offices of the Royal Institute of British Architects, 9, Conduit-street, London, W.

STANDARDISING SIZE OF BRICKS.

A CONFERENCE between representatives of the Institution of Civil Engineers, the Royal Institute of British Architects, and representatives of brickmakers will be held at 4 p.m. on Friday, the 26th inst., at the Building Trades' Exhibition at the Royal Agricultural Hall, Islington, to discuss the question of standardising the size of bricks. The following is the standard suggested by the two institutions:—

1. The length of the brick should be double the width plus the thickness of one vertical joint.
 2. Brickwork should measure four courses of bricks and four joints to a foot.
- Joints should be $\frac{1}{4}$ in. thick, and an extra $\frac{1}{16}$ in. making $\frac{3}{16}$ in. for the bed joints, to cover irregularities in the bricks; this gives a standard length of 9½ in. centre to centre of joints.

The bricks to be measured in the following manner:—

1. Eight stretchers laid square end and spay end in contact in a straight line to measure 7½ in.
2. Eight headers laid side by side, frog upwards, in a straight line to measure 35 in.

Eight bricks, laid the first brick frog downwards and then alternately frog to frog and back to back, to measure 21½ in.

This is to apply to all classes of walling bricks, both machine and hand made, and facing bricks.

The proposal to arrange a definite standard for the size of bricks is one which should meet with the approval and support of all who are interested in sound brickwork, it being impossible, with the varying sizes of bricks as at present made, to keep good sectional bond.

It is hoped that a resolution will be passed at this Conference which will establish a standard as suggested.

At the meeting statements will be made as to the standards observed in America and Germany. All who are interested in the subject of brickwork are invited to attend.

The Conference is initiated by the Science Committee of the Institute of Architects, of which Mr. H. D. Searles-Wood is the Hon. Secretary.

"THE ARCHITECT AND THE GARDEN."—Mr. Maule writes that it was incorrect to assign the design for the sundial on page 399 *ante* to Mr. A. N. Prentice, and that all the illustrations were designed and drawn by Mr. W. A. Forsyth for Mr. White's catalogue. Mr. Prentice's name, however, was certainly on the drawing lent to us; we presume it got there by some mistake.

CORRECTION.—In our report last week of the smoker, &c., of the Cardiff Architects' Society we stated that it was given by the members of the Cardiff, South Wales, and Monmouthshire Architects' Society. This, we are informed, is hardly correct, as the smoker, &c., and the whole of the work of the winter session, were organised entirely by the Associates.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE twenty-third annual dinner of the Builders' Clerks' Benevolent Institution was held on Tuesday evening at the King's Hall, Holborn Restaurant. There was a large gathering, the chair being taken by the President, Mr. G. Appleton (Messrs. Turtle & Appleton). Among those present were Mr. H. Holloway (Vice-president), Mr. J. Howard Colls (Trustee), Messrs. A. B. Colls, R. Holloway, S. Holloway, E. Holloway, Stephen Collins, — Carmichael, C. J. Wade, C. Smithen, — Campbell, Stirling, Bussell, Turtle, R. Barrett, and J. Austin (Secretary).

After the loyal toasts, the Chairman proposed "The Navy, Army, and Auxiliary Forces," which was responded to by Lieut. Stirling.

The President, in proposing "The Builders' Clerks' Institution," stated that it was founded in 1866 for the purpose of granting pensions of 30l. per annum to necessitous clerks, and of 24l. per annum to their widows, for the maintenance and education of their orphan children, and for making grants of temporary relief. There was only one survivor of the founders, and that was their esteemed treasurer, Mr. E. Brooks, who had done much to bring the Institution to its present position. The secretary, Mr. J. Austin, had also been most indefatigable. Every year 600l. had to be raised for the pensions and to meet the calls of temporary relief, and another 100l. to meet the general expenses. The Institution was doing most valuable work, and should be supported to a far greater extent by the builders' clerks themselves. Considering the advantages and privileges obtained by subscribers, every builder's clerk who was receiving a reasonable salary should subscribe half-a-guinea or a guinea per year. By this means the total funds received each year would be about 1,500l. instead of 700l., and accordingly much greater help could be given.

Mr. J. Howard Colls then proposed "The Architects and Surveyors." He mentioned that the Institution had his fullest sympathy because of its good work and the fact that his father had taken the keenest interest in it. With regard to the architectural profession, there was never a time when it was in a more satisfactory condition, but he thought it a great pity that the late Queen's memorial, which was one of the greatest opportunities which had been given to the architects of this country, should be limited to so few competitors. He considered that this was an occasion when young architects should have an opportunity of showing what they could do, and he hoped that the feeling which was so widely spread would result in some alteration being made, so that the scope of this competition could be widened.

Mr. Charles Smithen responded, and promised to become an annual subscriber to the Institution.

Mr. F. S. Oldham (Messrs. Perry & Co.) submitted "The Builders." He stated that they had always been strongly supported by the master builders—an assistance which they greatly appreciated. The builders and their clerks always got on well together, and one never heard of such a thing as a strike among builders' clerks.

Mr. Henry Holloway, in reply, said the builders had reason to congratulate themselves upon the very able assistance they received from their clerks. He, as ex-President, could testify to the usefulness of the Institution the whole affairs of which were most admirably administered.

The Secretary announced that 262l. 2s. 6d. had been contributed that evening towards the support of the Institution. The list included—Messrs. Turtle & Appleton, 21l.; Mr. G. Appleton, 10l.; Messrs. Kirk & Randall, 10l. 10s.; Messrs. Gabriel & Sons, 5l. 5s.; Mr. R. Barrett, 5l. 5s.; Messrs. Oliver & Sons, 5l. 5s.; Messrs. Holloway Bros., 5l. 5s.; Mr. A. Ritchie, 5l. 5s.; Mr. J. H. Colls, 5l.; Messrs. The Carron Company, 5l.; Mr. Colin Patrick, 3l. 3s.; Mr. C. J. Smithen, 3l. 3s.; Messrs. T. Dower & Sons, 3l. 3s.; Messrs. Farquharson Bros. & Co., 3l. 3s.; Messrs. Hobbs, Hart, & Co., 3l. 3s.; Messrs. Foster & Dickie, 3l. 3s.

The President next proposed "The Merchants," and expressed his thanks for the liberal support they had given.

Mr. C. J. Wade responded, and stated that he hoped the total of the subscriptions would be increased to 300l. In order to encourage this he would undertake to get a firm to give

5 per cent. subscription for every new annual subscriber within a fixed period.

Toasts to the President, Past-Presidents, and the visitors concluded the proceedings.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council, held on 1st inst., being the day before the Council adjourned for the Easter recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the order of reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage and Projections.

Chelsea.—A one-story addition in front of the Swiss Cottage beerhouse, No. 109, King's-road, Chelsea (Messrs. A. R. Barker & Son for Messrs. Michell & Aldous, Limited).—Consent.

Lewisham.—Three houses, with shops on the ground floor, on the north side of Perry Vale, Foot Hill, Lewisham, between Siddons-road and Woolstone-road (Mr. R. Willock for Mr. D. A. Scott).—Consent.

Lewisham.—An addition to No. 14, Kirkdale, Sydenham, at the corner of Peak Hill (Mr. J. P. Briggs for Mr. W. Cobb).—Consent.

Bermondsey.—One-story shops on the forecourts of Nos. 61 to 73 (odd numbers only, inclusive), Lower-road, Rotherhithe (Mr. T. W. Biggs for Mr. S. Single and Messrs. Stansfeld & Co., Limited).—Consent.

Penge.—A warehouse building on the south-east side of Green-lane, Penge, near Beckenham-road (Mr. E. Williams for Mr. A. Olby).—Consent.

Holborn.—A sign, to overhang the public way, in front of No. 211, Shaftesbury-avenue, Holborn (Mr. G. Wragge).—Consent.

Peckham.—Six houses on the north-east side of Forest Hill-road, Camberwell, at the corner of Honor Oak Rise (Mr. G. A. Lansdown for Mr. J. E. Lamerton).—Consent.

Dulwich.—An open shed at the rear of No. 10, Alleyn-terrace, Park-road, Dulwich, to abut upon South Crooked-road (Mr. W. Burrell for Mr. L. French).—Consent.

Clapham.—One-story shops upon part of the forecourts of Nos. 2 to 10 (inclusive) Penasbury-terrace, Wandsworth-road, Wandsworth (Mr. G. Sherrin for Mrs. C. E. Wigmore).—Refused.

Hammersmith.—A theatre building on the north side of Hammersmith-road, Hammersmith, at the corner of Rowan-road (Mr. W. G. R. Sprague for Mr. J. B. Mulholland).—Refused.

Holborn.—Two oriel windows, at the first, second and third floor levels, in front of Nos. 108 and 110, High Holborn (Mr. W. C. Waymouth for Messrs. Cardinal & Harford).—Refused.

Wandsworth.—Three one-story shops on part of the forecourt of "The Esterels," No. 223, Balham High-road, Balham (Mr. W. C. Poole for Mr. E. Coates).—Refused.

Width of Way.

Camberwell, North.—A three-story tenement house on the east side of Crown-street, Camberwell, at less than the prescribed distance from the centre of the street, and to exceed in height the width of the street (Mr. E. J. Stevens for Mr. R. Knight).—Consent.

Wandsworth.—That the application of Mr. S. J. May for Messrs. Carlo Gatti and Stevenson, for an extension of the period within which the erection of buildings and a boundary fence at Gothic Wharf, Brewhouse-lane, Putney, at less than the prescribed distance from the centre of the street, was required to be completed, be granted.—Agreed.

Hackney, South.—That Mr. J. Hamilton be informed, in reply to his letter on behalf of Messrs. W. J. Bush & Co., Limited, asking permission to retain the portion of the forecourt of Ash-grove works at less than the prescribed distance from the centre of Sheep-lane, Hackney, and to be allowed to erect a wall to enclose such forecourt, that the Council is not prepared to accede to his request.—Agreed.

Lines of Frontage and Width of Way.

Kensington, North.—A block of studios, with bay windows, oriel windows and a angle-turret, on the site of Nos. 89 and 91, Ladbroke-road, Kensington, to abut upon Ladbroke-road, Lansdowne-road, and Boye-terrace-mews (Mr. W. Flockhart for Mr. E. Davis).—Consent.

Kensington, South.—That the application of Mr. A. Blackford for Mr. A. R. Bulley, for an extension of the periods within which the erection of a block of residential flats, with bay-windows, on the site of Nos. 79, 81, 83, 85, and 87, Drayton-gardens, Kensington, was required to be commenced and completed, be granted.—Agreed.

Peckham.—One-story shops on the forecourts of Nos. 1, 3, 5, and 7, Blenheim-grove, Rye-lane, Peck-

ham, at less than the prescribed distance from the centre of the street (Mr. W. L. Dowton, for Mr. J. Shinkfield, Mr. G. T. Maloney, and Mr. W. Chapman).—Refused.

Formation of Streets.

Whitechapel.—Variations from the plan sanctioned by the Council for the formation or laying out of three new streets out of the east side of Middlesex-street (formerly Sandy-row), Spital-fields, so far as relates to an alteration in the position of a portion of the street to be named Short-street (Messrs. Cabitt-Nichols, Sons, & Chuter for Sir A. K. B. Osborn).—Consent.

Woolwich.—That an order be issued to Mr. J. O. Cook refusing to sanction the formation or laying out of new streets for carriage traffic on the south side of Tuam-road, Clay-lane, Plumstead (for Mr. W. G. Dawson and Mr. J. Harper).—Agreed.

Buildings for the Supply of Electricity.

Holton.—For a generating station and works on the west side of Bath-place, Haggerston, at the corner of Whiston-street (Messrs. Kincaid, Waller, & Manville for the Council of the Metropolitan Borough of Shoreditch).—Consent.

BOOKS RECEIVED

FIRE TESTS WITH DOORS (No. 60 of Reports of the British Fire Prevention Committee).

Correspondence.

To the Editor of THE BUILDER.

THE NATIONAL MEMORIAL TO QUEEN VICTORIA.

SIR,—Many old readers of the *Builder* must, like myself, feel grateful for the leading article last week, and especially for its concluding paragraph. For the memorial to Queen Victoria, the best of Queens, all sorts and conditions of men will be satisfied with nothing short of the best of monuments; and as subscribers in showing their desire to honour by it their late Sovereign, it should be a national and not a restricted affair in any sense, still less so in that of its authorship, nor should the function of judging the designs submitted be either hasty or weak. An open competition may perchance find yet another Alfred Stevens, and bring him to the fore, but a limited one never will.

The best monument, when reflected in a canal after the manner of the Taj Mahal, is indeed a happy inspiration and may lead to more; and, coupled with it, the overflow to a lower level to keep the water stirring and sweet, the diversion of noisy traffic, and, above even these, the suggested new front to the Palace itself—greater even than the flanks of the canal in value to the whole effort, forming, as it were, a worthy backing to the whole scheme, which as at present it is not and could never be so considered. Another strong point in favour of the canal scheme appears to lie in the fact that it is in the main a restoration of a former state of things there.

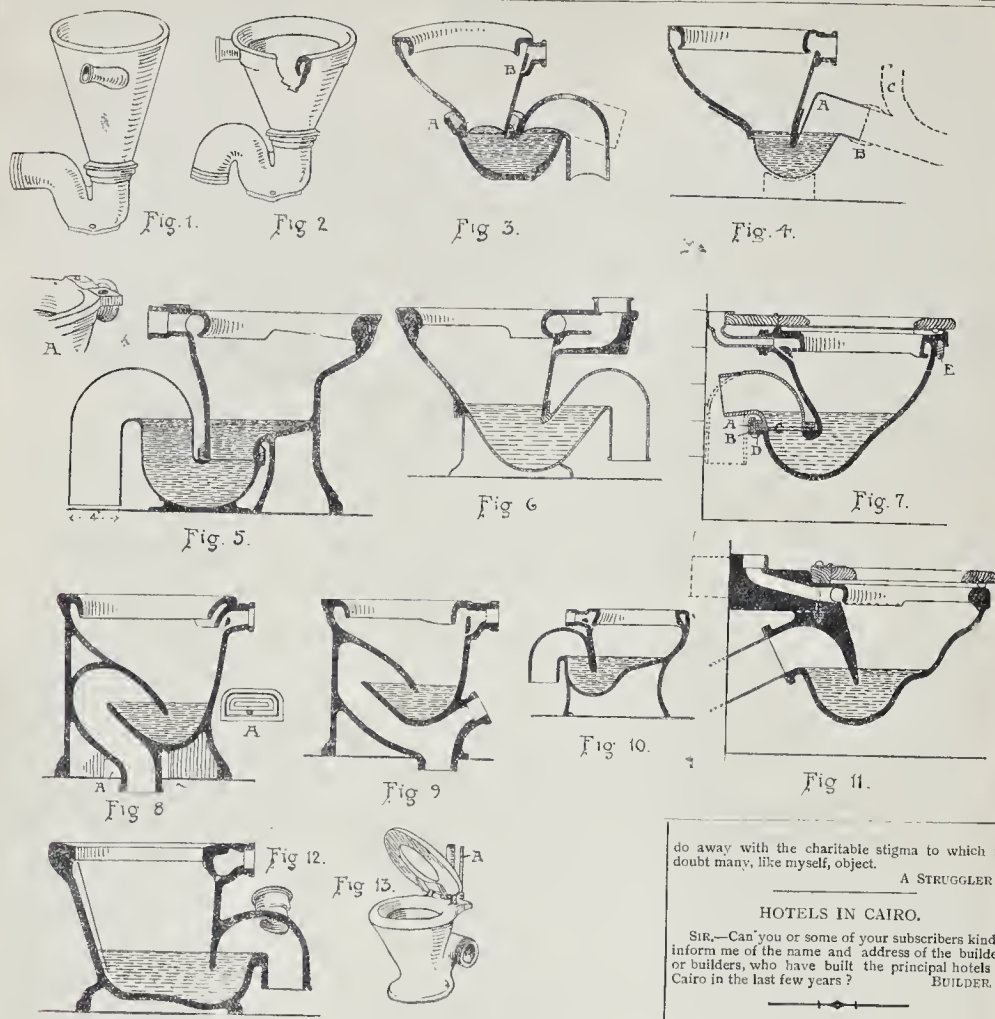
What appears to be a weak point in the plan is that the approach to the quadrangle of the Palace is, under the revised conditions, not central; but, as a matter of plan and elevation too, this could be easily obviated by creating a loggia forming a similar treatment to the gateway, uniform with it and equidistant from the south side of the quadrangle.

I am glad that you have some words of praise for the much-criticised "Albert Memorial," which is useful as a factor of warning, in that it shows how foolish we shall be if we repeat the mistake so conspicuous there—that of being central with nothing whatever. Opinions may differ as to the folly of concealing its static existence, of its unidealised figure, its white podium, sacrificing the idea of solidarity where most required; but scarcely any one could support the primary blunder (rarely, if ever, seen in foreign cities) of its unfortunate "placement," for which, I believe, its designer was not responsible.

E. S. II.

SIR,—The leading article in last week's *Builder* discusses this subject from many practical points, but neither therein nor in any reference to the subject that has come under my notice has allusion been made to a question of very considerable importance in connexion with portrait sculpture in the open.

I realise that the sketch-plans illustrating the article in the *Builder* are simply suggestions which probably would be widely departed from in any scheme which might be adopted. Nevertheless, as the site of the Mall has been selected, and the front of Buckingham Palace is at present the terminus feature thereto, the natural inference is that the position so far assigned to the statue of Queen



Illustrations to Student's Column.

Victoria is as thereby suggested, i.e., in front of the Palace facing down the Mall.

Unfortunately, neither of the plans given indicates the points of the compass, but reference to a map of London will show that the direction of the Mall towards the Palace is almost due south-west; consequently, the result of placing a statue facing down the Mall will be that during the greater portion of the day the sun will be towards the back of it, therefore it would rarely be seen to advantage.

The suggested canal scheme, admirable as it might be made with the aspect reversed, would, I submit, be a mistake, because, as the sun would generally be in front of the spectator, the reflection from the water would be so dazzling at times that the view of the monument and buildings in the distance would be obscured.

It is of interest to note that in the selection of a site for the Albert Memorial consideration must have been given to the important point of aspect; for there the figure rightly faces almost due south.

WILLIAM HENMAN, F.R.I.B.A.

. The aspect of the Albert Memorial statue was probably settled by the consideration that it was to be regarded in connexion with the Albert Hall, and the statue would therefore naturally face towards the Hall. The position of the monument to Queen Victoria has been suggested by the Committee as forming an object at the end of the Mall, treated as "a processional road." On that principle the monument must certainly face the "processional road"; it cannot turn its back on it. There is reason in Mr. Henman's point about the aspect in regard to lighting, but if the Committee retain their idea of grouping the monument with a processional road, the question of aspect would have to be considered as secondary. The only way, on this site,

to reconcile the two conditions would be to give up the processional road, and place the monument further from and facing the Palace, as the Albert Memorial faces the Albert Hall. It is a question, however, whether more would not be lost than gained by the change.—ED.

THE ARCHITECTS' BENEVOLENT SOCIETY.

SIR,—Referring to the report of the annual meeting of the Architects' Benevolent Society, I would like to suggest that, if the Society could be made more generally useful to architects, the benevolent funds available would probably be much higher; for instance, the Society, so far as I am aware, is not constituted to meet the following benefits conferred on its members by similar societies in other professions:—

1. Legal assistance in upholding the status of its members, and in defending cases of alleged negligence, &c.;
2. Granting loans at small interest, to struggling members;
3. Keeping a register of employers requiring assistance, and of assistants requiring employment;
4. Holding quarterly meetings to hear papers read and discussions on all matters affecting the status and general well-being of architects;
5. A system of mutual benefit insurance and savings bank.

If these benefits were conferred on members, it is probable that the majority of the architects and assistants in the United Kingdom would be found willing to pay a subscription of from 10s. to 15s. per annum, and instead of an income of 500l., it is possible that 5,000l. would be available, and thereby

do away with the charitable stigma to which no doubt many, like myself, object.

A STRUGGLER

HOTELS IN CAIRO.

SIR,—Can you or some of your subscribers kindly inform me of the name and address of the builder, or builders, who have built the principal hotels in Cairo in the last few years?

BUILDER.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

14.—WATER-CLOSETS (continued).

NON-MECHANICAL CLOSETS.—These may be divided into four classes—hopper, wash-down, wash-out, and siphonic. Trough-closets and latrines are also non-mechanical closets, but it will be most convenient to consider these separately. Waste-water closets form a class by themselves.

Hopper Closets.—In their simplest form these consist of a conical hopper (usually of glazed fireclay) with a trap of the same material below. There are thousands still in use in the outbuildings of cottages without any apparatus whatever for flushing. An occasional pailful of water is the only cleansing they receive. Such closets ought certainly to be condemned as nuisances, as they are not only foul in themselves, but cause deposits in the drains. Hoppers are generally known as long or short, according to their height. Fig. 1 shows a long hopper; it has a diameter of 14 in. at the top and 4 in. at the bottom, and a height of 15½ in., exclusive of the trap. The connexion for the flush is placed at the side in such a manner that the water circulates around the basin in a spiral form. The short hopper (fig. 2) is 11½ in. high, or (including the trap) 16 in.; the closet and trap can both be fixed above the level of the floor. This closet is shown with a flushing rim and the trap is a modified S-trap with shortened outlet, so that the joint is above the floor; it is sometimes known as a Q-trap. Fig. 1 shows a

P-trap. An ordinary S-trap, with or without ventilation socket, can, of course, be used with either the short or long hopper.

Sometimes the hoppers and traps are made of enamelled cast-iron, but, whatever the material, they are almost invariably enclosed with woodwork. The cheapness of hopper closets is the sole reason of their popularity; a short or long hopper, cane outside and white inside, can be obtained for 2s., and a trap for 1s., and it is no wonder, therefore, that they have been very frequently used in cottages and in the servants' closets of larger houses. An enamelled iron hopper with trap is more expensive, costing from 20s. to 25s. The great disadvantage of the hopper closet is that the water area is so small (only 4 in. in diameter, as a rule), and that it is consequently impossible to avoid fouling the basin; this defect is, of course, more pronounced in the long hopper. The flushing arrangements are often inadequate, and the wood enclosure is also objectionable. For these reasons the long hopper closet ought not to be used at all, and the short hopper closet ought not to be fixed inside houses, and even in outbuildings should only be used in connexion with a flushing cistern containing at least two gallons of water.

Wash-down Closets.—These are really identical in principle with the hopper closet, consisting simply of a basin and trap. Many so-called "wash-down" closets are nothing but short hopper closets with the shape of the basin modified to reduce the risk of fouling. It would be more satisfactory if the term "wash-down" were confined to closets with a water surface appreciably larger than that of the hopper closet. The basin in fig. 3 has a straight back, and the trap has a large socket A for receiving the basin, so that a good cement joint can be made between the closet and trap. The flushing nozzle is arranged so that the last portion of the flush drains slowly through the hole at B and recharges the trap.

Wash-down closets may be broadly divided into closets with loose traps and closets with the basin and trap in one piece. In each class there may be a further sub-division into closets for enclosure with woodwork, pedestal closets, and suspended or bracketed closets. The improvements to which inventors have chiefly turned their attention have been the improvement of the shape of the basin and the increase of the surface of the water standing in it (so as to reduce the risk of fouling), and the better design of the trap and flushing apparatus, so that the trap as well as the basin may be cleared at every flush. The ventilation of the trap and depth of seal, the method of connecting the trap to the branch of the soil pipe, and other points have also received careful attention.

As long ago as 1852 the General Board of Health of this country recommended two forms of pedestal wash-down closet with the basin and trap in one piece of glazed ware. In one the basin is of ordinary short hopper form and has only a small water surface, but that in the second has a recessed back and a fairly large area of water. The designs are historically interesting, but are not of any practical value at the present day.

The "Hygienic" closet (fig. 4) may be given as an example of a wash-down closet with separate trap. The latter may be of earthenware to match the basin or (as in the illustration) of lead. The lead trap allows a wiped soldered joint to be made at B between the trap and the lead branch of the soil pipe. The trap is of the well-known "Anti-D" shape, having a square angle at A to reduce the risk of siphonage. The ventilation pipe C may be connected with the branch of the soil pipe as shown at C. A wide flange of lead around the inlet of the trap forms a good seat for the basin, the joint being made tight with white lead or "elastic" cement. The objections to this basin are the small area of water and the large exposed surface of the basin.

The next example (fig. 5) shows a more recent closet of the same type, the "Compactum." In this the water area measures 8½ in. by 6½ in., and the depth of the trap-seal is increased to 3 in. The flushing rim is also of improved form, so as to discharge the bulk of the water towards the front of the basin, and the basin is made with an extension at the back (shown at A) to which the seat can be attached; this is better than fixing the seat to the wall, and a further advantage is that the extension is raised so as to keep the seat clear of the basin. The "Compactum" is

a pedestal closet, and is made with a drawn-lead trap of P or S form, or with a pottery trap in one piece with the basin. The lead trap can be turned in any direction at the rear of the basin within an angle of about 90 deg.—that is to say, 45 deg. on either side of the central line of the closet. This is a great convenience in many situations. Fig. 6 shows a "Citizen" closet, with glass-enamelled cast-iron trap and glazed fireclay basin; it is intended for use in industrial dwellings and other places where the apparatus may be subjected to rough usage. Pedestal closets are also made with half-traps, as in fig. 7, the advantage being that the joint between the pottery and metal is below the water-line, and that leaks can be discovered as soon as they occur.

The pedestal closet was a great improvement on the enclosed closet, as it allowed the floor and wall around the closet to be kept clean. But a further improvement was effected by supporting the closet on lugs or brackets, so as to be entirely clear of the floor. An example of this kind with drawn-lead half-trap is given in fig. 7. The basin is of white glazed earthenware with half-trap, having a flanged outlet D, to which the flange A of the lead half-trap is joined by means of a rubber washer C, and a loose brass collar B secured with hook-bolts. The trap may be of P or S form. The basin has a "slop-top" with raised rim, and is supported on an iron band E bedded in putty, this band being in turn supported by iron brackets. The surface of the water in the basin measures 7 in. by 5½ in., and the depth of trap-seal is 2 in.

Closets with basin and trap in one piece are almost invariably made as independent pedestal or bracket closets. The designs for pedestal wash-down closets are innumerable. The position of the trap outlet modifies the design to a very considerable extent. Fig. 8 shows a wash-down closet with central outlet intended to take the place of a valve or pan closet without altering the position of the branch of the soil-pipe. The joint at the outlet of the trap is not above the floor, and the closet therefore contravenes the regulations of the London County Council. The water area in such closets is necessarily small. In most closets of this kind it is impossible to make a thoroughly good joint at the outlet of the trap or to inspect it afterwards. In the example given, however, the side portions of the pedestal are made loose, as shown at A, so that the joint can be made and afterwards repaired. The trap itself is not ventilated. It is a great mistake to fix a new closet on old plumber's work—at any rate if this was formerly connected with a pan-closet—as the old plumbing is in all probability as insanitary as the old closet.

The closet with back outlet (fig. 9) is intended for fixing in the place of an old "wash-out" apparatus, without having to alter the branch of the soil-pipe. Like the previous example, it has only a small area of water. The trap has a ventilation-socket, although not in a very good position, and the outlet joint of the trap, although accessible from the back of the pedestal, is not above the floor.

The well-known "Simplicitas" closet, 1898 pattern, is one of the best modern wash-down apparatus. The water-area (fig. 10) is about 10½ in. by 6½ in., and the surface is brought well up towards the seat. The depth of the trap-seal is 2 in., and the outlet of the trap (which may be of P or S form) is well above the floor. The original "Simplicitas" closet had a water-area measuring only about 6 in. by 5 in., or less than half that of the new pattern.

Bracket wash-down closets, in one piece of fireclay, are made by different firms under licence from Mr. Hellyer, the original patentee, who, we believe, was indebted for the idea to Mr. Keith D. Young, F.R.I.B.A., although he had previously made specially-shallow wash-down closets and supported them on flat cast-iron brackets. They have the advantage of leaving the floor perfectly unobstructed, and have been adopted largely for hospitals and asylums. They are known by various names, such as Bracket, Corbel, Console, and Projector. The projection ought to be such that the joint between the outlet and the branch of the soil-pipe is within the room, and not in the thickness of the wall. Fig. 11, known as the "Projector," is satisfactory in this respect; the water-area is about 7 in. by 6 in. The bottom of the closet is 3 in. above the floor.

It is impossible in the space at our disposal

to discuss all the different forms of wash-down closet. Strong glazed fireclay or enamelled cast-iron closets are made for workshops and other places where they will be subjected to rough usage. For prisons the fireclay closet is sometimes encased in sheet-iron, the space between being filled with cement, while the flushing apparatus is actuated from an adjacent corridor. In some cases, prison closets are made to fit an angle of the cell. Some pedestal closets are made with a flat back to fit closely against the wall; this does away with a confined space which is difficult to keep clean, but the outlet joint must be formed in the thickness of the wall and cannot be inspected without removing the closet or providing an inspection opening on the outside of the building.

The wash-down closet shown in fig. 12 represents a new departure in some respects. It is known as the "Anti-fouling and Non-contagious Water-Closet," and was designed by an architect (Mr. Lanyon, of Belfast) for use in public places, and in barracks, workhouses, and other institutions. The plan of the basin is long and narrow, measuring at the water-line about 10½ in. by 4½ in.; the back is nearly vertical and is kept well in the rear of the opening at the top of the basin; in the front of the basin a shallow recess or groove is formed, which is continued forward through the rim and seat. The flushing-rim has the openings equal in area to the area of the flush-pipe, the openings being increased in size towards the front, so that the principal part of the flush is discharged in the front part of the basin. The rim is 3 in. wide, and slopes inwards, so that the closet can be conveniently used for slops or as a urinal. There is a good depth of water in the basin, so as to prevent fouling of the bottom. The seat also is specially designed. The outlet of the trap is above the floor, and is provided with a ventilation socket. A three-gallon flush is required to clear the basin and trap.

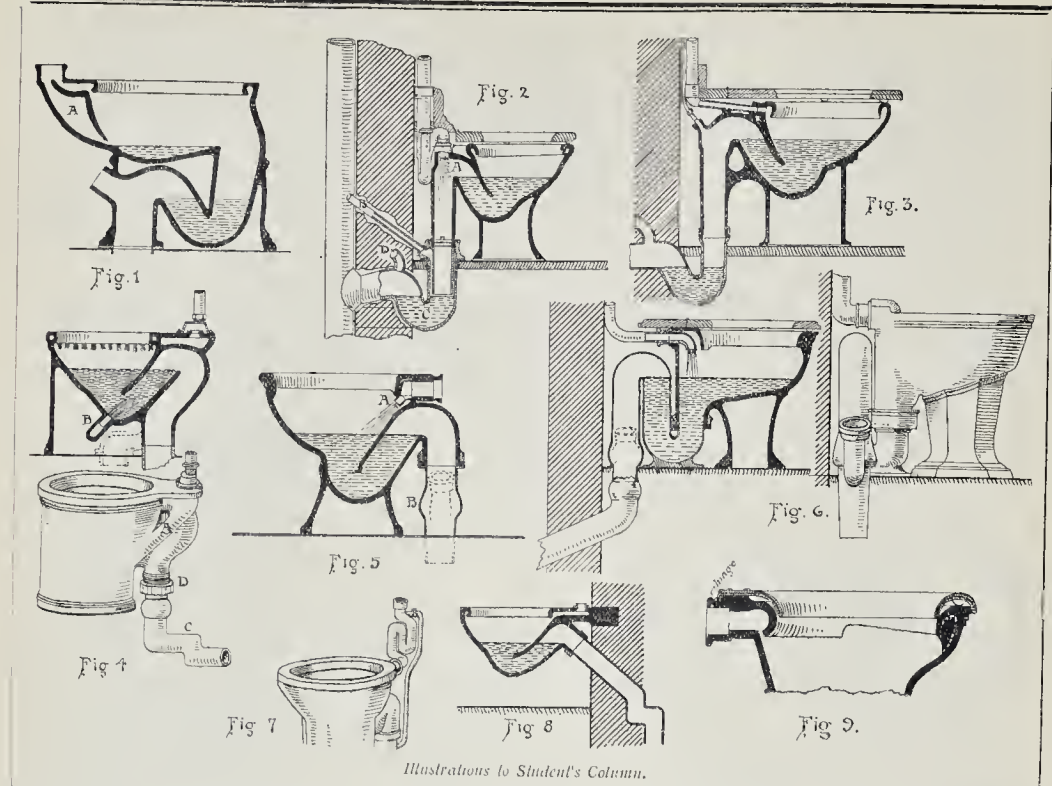
The closet shown in fig. 13 is one of Adams' and is peculiar in having the outlet of the trap turned to the side. This is convenient when the closet must be fixed with the back against a return wall at right angles to the external wall. The basin and trap may be in one piece of "Titanite" as shown, or a half-trap of lead may be used after the manner illustrated in fig. 7. The wood seat is supported on the lead extension at the back of the basin, and the cistern is operated automatically (by means of the spindle A) when the seat is released.

15.—WATER-CLOSETS (continued).

WASH-OUT CLOSETS.—These closets were very popular from fifteen to twenty years ago, but are now little used. The special feature is a shallow basin for the reception of the faeces. This basin holds water to the depth of about 1 or 1½ in., and has a weir on one side, over which the contents are driven by the flush of water from the cistern into the trap below. The force of the water is broken by the basin, so that the trap is seldom cleared with one 2-gallon flush. The lip of the weir and the sides of the vertical tube leading to the trap are quickly coated with filth, and the depth of water in the basin is too little to cover and deodorise the soil. The closets are made for enclosure in woodwork or as pedestals, the trap (which may be of S or P shape) being sometimes in one piece with the basin (as in fig. 1) and sometimes in a separate piece. An after-flush chamber A is provided on the inlet horn to recharge the basin.

Siphonic Closets.—We have seen that the washdown closet was evolved from the hopper closet. The siphonic closet is merely another step in the process of evolution. The basin is practically a washdown basin, but with a greater depth and area of water and a greater depth of trap-seal. The outlet-arm of the trap is also continued well below the bottom of the basin, in order that the greater portion of the contents of the basin may be removed by siphonage.

The essential difference between the wash-down and the siphonic closet is that in the former the contents of the basin are driven out by the flush, while in the latter they are drawn out by siphonic action, which is indeed started by the flush but, when once started, continues independently. The method of starting the siphonic action varies in different closets. Siphonic closets are almost invariably made in pedestal form, and may there-



Illustrations to Student's Column.

fore, when fixed in houses, be used as slop-receivers. In some closets the siphonic action will be started if a pailful of slops or water is poured into the basin, and the contents of the basin will be siphoned out without the flushing cistern being put into operation. The seal of the closet-trap may therefore be destroyed or very much reduced. Other closets, however, are so designed that the siphonic action can only be started by the water from the flushing cistern. Others, again, are so arranged that if from any cause the siphonic action of the basin is started, the flushing cistern is automatically set in action.

Many siphonic closets require a trap on the branch of the soil-pipe in addition to the trap in the closet itself. This forms a double safeguard against the entrance of drain air; but as the pipe between the two traps cannot be properly ventilated (otherwise the siphonic action could not take place), it may contain foul air, and some of the most recent closets substitute for the second trap one or more square bends in the branch pipe, which ensure siphonic action by checking to some extent the escape of the water.

Jennings & Morley's "Closet of the Century" (fig. 2) is one of those with two traps, although it can also be used with a weir bend, instead of the lower trap. Siphonic action is started by part of the flush-water passing through a nozzle, A, into the top of the long leg of the siphon, the air in this leg being at the same time expelled through the puff-pipe, B. The second trap, C, is of lead, and can be ventilated, if necessary, by the pipe D. Part of the flush is diverted to the flushing rim, in order to cleanse the basin. It is obviously a disadvantage, when only a small quantity of water is allowed by the water companies, that a great part of it should not pass through the basin, and various closets have been designed in which this objection has been overcome.

Doulton's siphonic closet (fig. 3) is on the same general lines as Jennings & Morley's, but with "the full discharge from cistern passing through and cleansing basin." The area of the water is 12 in. by 9 in., and the greatest depth 6½ in. The depth of the trap-seal in the basin is 3¼ in. The bore of the outlet leg of the closet is 2½ in., which is found to be sufficient for the passage of soil and

paper. The joint between this and the lower trap is above the floor. It is claimed that the basin cannot be siphoned out by pouring slops or water into it.

The "Twycliffe" siphonic closet (fig. 4) does not require a second trap. The siphonic action is started in an ingenious but simple manner by taking part of the flushing water down the arm A and discharging it at B in the direction of the outlet arm of the trap. The soil is therefore cleared out by the first part of the flush. The peculiar bends in the branch-pipe C are supplied with the closet, and are introduced to check the water until siphonic action is properly set up. These bends are in one piece of lead wiped to a brass socket at the top, so that the joint at the closet-outlet can be made with neat cement; or a brass screw-cone joint is made as shown at D; or a short lead tail-piece is united to the outlet by a porcelain metal wiped joint, to which tail piece the lead bend can be united by an ordinary wiped joint. The area of the water in the basin is about 12 in. by 10 in., the greatest depth 7½ in., and the depth of trap-seal 3½ in. A flush of two gallons is sufficient to clear and recharge the basin, but in this, as in other siphonic closets, a 3-gallon flush is safer. The flushing-rim has a series of holes, instead of the usual continuous opening. The closet is also made with a central outlet at the floor-level, as shown by the dotted lines, but this cannot be recommended. A close imitation of market. The "Twycliffe" siphonic closet is also on the trap being in front instead of in the rear; by this arrangement the pottery tube leading straighter, but the bend at the top of the trap is necessarily constricted; according to the published section, it measures at one point less than 1½ in.

The "Injecta" siphonic closet (fig. 5) has a basin of almost normal wash-down form, but containing more water and having a deeper seal. As in the "Twycliffe" closet, siphonic action is started by a jet of water, but in this case the nozzle is at the back of the flushing rim and is directed into the standing water in the basin. The tail-piece B is a patented part of the apparatus, and is united to the pottery outlet of the closet by a special soldered joint. On one side

of the tail-pipe a socket is found for the puff or ventilation pipe, which must be connected to the main ventilation pipe. The depth of seal is 3½ in., and the closet can be cleared and recharged with a 2-gallon flush.

The "Barrhead" siphonic closet (fig. 6) has a water area measuring 13½ in. by 11 in., and an 8-in. seal. The trap, which has a 3-in. bore, is of lead united to the basin by a special soldered joint. As in the last example, the siphonic action is started by a jet of water descending from the back of the flushing rim, and the long leg of the siphon has the bulbous portion with ventilation socket. This closet cannot be unsealed by slops, and can be cleared and recharged by a 2-gallon flush, although it is, of course, preferable to use a 3-gallon cistern where possible. In the section, the long leg of the siphon is shown behind the short leg, but in practice it is placed at the side in order to reduce the projection from the wall; this is correctly shown in the elevation. The long leg of the siphon is also made sloping, like the tail of a P-trap, so as to pass directly through the wall. The outlet is then connected into the side of the soil-pipe. All the joints, including those of the puff-pipe, are therefore outside the building, with the exception of the joint between the closet and trap, and this joint is under water.

In the case of closets in which siphonic action may be started by a pailful of slops or water, Dicksee's arrangement (fig. 7) is sometimes introduced. This is simply a small air-pipe connecting the long leg of the siphon and the flush-pipe, the flush-pipe being trapped below its connexion with the air-pipe. When the siphonic action of the closet is started air is drawn from the flush-pipe, and this starts the siphonic action of the flushing cistern.

Siphonic closets have recently been made in bracket form to stand clear of the floor. The "Console Siphon" water-closet (fig. 8) is an example. It is on the lines of the "Twycliffe"; the bent outlet leg of the siphon is of brass. The basin has a 3-in. trap-seal, and requires a flush of three gallons. The total depth of the basin is only 12 in., so that there is a space of about 5 in. between it and the floor.

It is unnecessary to give further examples. All siphonic closets have a large water area

and deep seal, and thus possess some of the chief advantages of valve closets without their objectionable mechanism. It is essential that a siphonic closet should be fixed only in connexion with the flushing apparatus which has been specially designed to suit it, as the satisfactory working of the closet depends to a very large extent on the nature of the flush. Siphonic closets have been made to work with 1½-in. regulating supply valves similar to those used for valve closets, but valves of this kind can only be adopted in places where the water is supplied by meter or without restriction as to quantity, as, for example, in the case of a private supply. The long legs of the siphons are as a rule only 2½ in. or 3 in. in diameter, and there is no reason why the soil-pipes for single closets should be any larger.

Combination Closets.—This name is often applied to closets in which the flushing cistern is placed immediately above the seat of the closet. Such closets were originally introduced for fixing in places where the water would not rise to the level of the ordinary flushing cistern, but have proved so satisfactory, that they are now being used with high-pressure water supplies. The principal advantage is that they are less noisy in action. This is partly due to the lower velocity of the water when the cistern is in operation, partly also to the fact that the cistern is always provided with a cover. The cistern may be of cast iron or pottery, but the writer prefers wood lined with lead or copper, as the wood also assists in deadening the sound. The cistern may be of the valve or siphon type, but must have a large outlet, as the lower velocity of the water necessitates a larger volume being discharged in a given time. A closet of this kind may where a window prevents the cistern being fixed in the ordinary position above the closet. If the cistern is fixed on one of the side walls, two additional bends must be made in the flush-pipe, and these not only add to the cost, but are unsightly and very considerably reduce the power of the flush, and, if the wall is a half-brick wall, the noise of the cistern will be transmitted to the adjacent room. Low-level cisterns of this kind are now applied to siphonic as well as to wash-down closets.

The name "combination closets" may also be applied to water-closets which are specially designed to serve another purpose besides that for which they are primarily intended. In small houses the water-closet usually serves also as slop-closet and urinal, and it is therefore desirable that the rim should be of a good width and made to slope inwards, as shown in fig. 12 of the preceding article. Sometimes the top of the basin is widened to form a "slop-top," which is provided with a raised rim, as shown in fig. 7 of the preceding article. In the "Hy-back" combined water-closet and urinal the basin has a vertical extension at the back and the seat is of horse-shoe shape, pivoted in the middle, the wings being weighted at the back, so that the seat, when not in use, remains in a vertical position. Such an arrangement cannot possibly be adopted in a private house, or anywhere else where decent people congregate.

A much more elaborate combination is that designed by Mr. J. J. Lish. It is water-closet, urinal, slop-sink and draw-off sink (for hot and cold water), and is supplied with loose fittings, so that it can also be used as a lavatory, bidet, and rising douche-bath. The urinal is a curved porcelain slab rising from the back of the basin, but covered by a glazed door when not in use. The whole of the apparatus above the closet seat is encased with woodwork and forms a ventilation shaft, in which a gas flame can be kept burning to induce an up-current, which will also be assisted by the hot-water pipe placed within the casing. A glazed door is hung in front of the gas flame, so that this serves to light the room. Elaborate combinations of this kind, like the wonderful pocket-knives, which we used fondly to believe (until we bought them) equal to a whole chest of tools, will never prove entirely satisfactory. They will be useful in the confined quarters of bachelors, or elsewhere on occasion, but are not likely to come into general use. The ventilation shaft rising from the basin of the closet is certainly a good idea. Of all the rooms in a building the water-closet is the one where extraction of air ought to be most carefully provided for.

Water-closet seats are commonly made of

wood, left plain, or painted, varnished, or polished. Polishing is the best finish. Where the closet may be used as a slop-sink or urinal, the seat must be hinged so that it can be readily raised, or swung on pivots and weighted behind the pivots so that it remains in an upright or inclined position when not in use. Hinged seats ought to have rubber buffers underneath to prevent injury to the basin, and it is a great convenience to have the basin formed with an extension at the back to which the back rail of the seat can be fixed. Sometimes the wood back rail is omitted, the seat being hung to brass supports rising from the pottery seat-extension; this allows the whole of the basin to be cleaned. Many seats are made of two thicknesses of wood, placed with the grain at right angles to each other to give additional strength and to prevent warping. Hinged lids or flaps are useful in deadening the sound of the water in the basin and in preventing splashing on to the floor, but the polish on the underside is soon destroyed by the moisture. Indurated wood-fibre seats have also been made. Sheet-metal seats have been tried, but unless covered in some way are too cold for comfort. A very good covered seat of this kind is shown in fig. 9. It is known as Shanks's "Metallo-Vulcanite" seat, and consists of a piece of stamped sheet-steel covered on both sides with a substantial coating of black, red or brown polished vulcanite. The seat is light, durable, and non-absorbent, and has been used in hospital work. The hinges are at the back of the seat extension, so that the whole of the basin can be thoroughly cleansed. Rubber buffers are provided under the seat.

In workshops and some public places the seat is occasionally omitted, but this leads to fouling of the pottery. A better plan is to fix wood pieces on the side portions only of the closet rim, leaving the pottery exposed along the front and back, or to use a hinged seat with the front portion cut entirely away. Such a seat is not, of course, very strong, but it has certain sanitary advantages.

OBITUARY.

MR. H. H. BULL.—The death took place at Southampton on the 15th inst. of Mr. Henry H. Bull, builder and contractor. The deceased was a member of the firm which had the contract for building the Parliament buildings at Capetown and the Law Courts in London. The last-named work, it will be remembered, was beset with many difficulties, not the least of which was the great strike of masons, to combat which a great number of men were imported from Germany.

GENERAL BUILDING NEWS.

WESLEYAN CHURCH, OSMASTON.—At Osmaaston-by-Derby, on the 8th inst., the foundation-stone of a new Wesleyan chapel was laid. The building is situated on the east side of the main road, and will supersede the present iron structure. The walls will be brick, with Derbyshire stone dressings. There will be seating accommodation for 560 persons. The architect is Mr. John Wills, of Derby.

WESLEYAN CHURCH, TONES.—On the 8th inst. foundation stones were laid of a new Wesleyan church, Tones, which is being built in front of the school. Designed by Messrs. Bridgman & Bridgman, architects, Torquay and Paignton, the church will be in the late Decorated style. It will be of local stone with a facade of dressed limestone, the mullions of the front window and other stone dressings being of Bath stone. At the north-east angle, facing Fore-street, will be a tower terminating in a turret. The front of the building will recede from the street, from which it will be separated by a court and steps. The main entrance will be through a tiled vestibule at the north end, and there will be a second entrance on the west side. On the west side of the choir stalls will be the vestry, and on the east the organ chamber. There will be two aisles, and the floor will be of wood blocks. Provision has been made for the erection of a gallery at the north end, but this is not included in the present contract. Exclusive of the gallery, seating accommodation will be provided for 328 persons, the pews being of pitch pine. A pulpit of stone will be placed facing the west aisle. Messrs. Reeves & Sons are the contractors. Including the site the cost is estimated at 3,000*l.*

CONGREGATIONAL CHURCH, AVONMOUTH, GLOUCESTERSHIRE.—On the 8th inst. foundation stones were laid of a Congregational Church at Avonmouth. The site is at the corner of Napier and Victoria Roads. The church will consist of a nave and aisles with open timber roof. At the opposite end to the pulpit there will be a gallery. The choir and organ will be situated at the same end as the pulpit, in the apse, there being an apsidal

termination. A dwarf tower will be at the corner, the upper part of which will be used as a classroom. The church parlour will adjoin the apse, and be hexagonal in shape. The building is to be constructed of local stone with Bath stone dressings, the walls lined inside with buff bricks, and with a tiled roof, in which there will be dormer windows. The low pressure water system of heating apparatus will be fitted by Messrs. Crispin & Son. The architect is Mr. G. H. Oatley, and the builder Mr. W. G. Bindon.

CHURCH, SOMERCOTES, ALFRETON.—Plans for a new church at Somercotes have been prepared by Mr. Percy H. Cursey, of Derby.

BAPTIST CHURCH, CARLTON, NOTTINGHAMSHIRE.—A Baptist church and Sunday school buildings have been erected at Carlton from plans by Mr. R. Whitbread, of that town. The builder was Mr. G. Tegidine.

POOR LAW SCHOOLS, SIDCUP.—The foundation stone of the new Poor Law schools which the Guardians of the Greenwich Union have found it necessary to build at Halfway-street, Sidcup, for the accommodation of the children chargeable to the Union, was laid recently. The buildings will comprise four homes, to accommodate fifty boys each upon two floors, eight or ten in a dormitory, with playing-rooms, dining-rooms, kitchens, &c., on the ground floors, and two cottages, each to accommodate twelve boys. There will be ten pairs of cottages, each to accommodate fifteen girls and infants. In each will be a single bedroom for the girl who is next to be sent out into the world. That makes a total of 524, and besides there will be probationary cottages—two for boys, accommodating ten each, and the same number for girls—where new-comers will be kept for three or four weeks. An isolation block will give accommodation for dealing with four kinds of infantile disease, each being kept from contact with the other. The architect is Mr. T. Norman Dinwiddie, and the contractor is Mr. T. Rowbotham. The estimated cost of the buildings is 108,500*l.*, and Mr. Rowbotham's tender was for 107,777*l.* The buildings will be constructed mainly of Tunbridge Wells bricks, with tiled roofs.

PRIMITIVE METHODIST CHURCH, HASLAND, DERBYSHIRE.—A Primitive Methodist church has been erected at Hasland from designs by Mr. W. Cecil Jackson, of Chesterfield. It is intended to erect a tower at some future time. The building will accommodate 400 persons.

BANK PREMISES, CUPAR.—New premises for the Cupar Fire Savings Bank are being erected in Crossgate, Cupar. Plans have been prepared by Mr. Birrell, architect, of Cupar.

CO-OPERATIVE PREMISES, DUNFERMLINE.—A furniture warehouse has been erected in High-street, Dunfermline, for the Dunfermline Co-operative Society, Limited. Provost Scobie, of Dunfermline, was the architect.

BUILDING IN HULL.—Plans for 229 new houses were passed by the Works Committee during March last. It is evident that the threatened slump in the building trade does not deter speculative builders from developing the new building estates off Prince's-avenue and in other parts of the city. The supply up to the present appears to have been only equal to the demand, for no sooner are houses built than they are occupied, even before the plaster on the walls is dry. The opening up of the Prince's-avenue district is perhaps one of the most notable transformations ever seen in the city. What only three years ago was open fields is now a forest of houses, with streets each half a mile long. The new street—Chanterlands-avenue—running from Walton-street behind the Western Cemetery and across the extreme end of Marlborough and the other avenues, is now open, and building operations are about to be commenced.—*Eastern Morning News.*

THEATRE ROYAL, SEAHAM HARBOUR.—The new Theatre Royal, Seaham Harbour, has been erected on the site of the old Theatre Royal, in Green-street. The building covers an area of 908 square yards and is of brick, the external walls being of red glazed bricks. The stage measures in width 46 ft., from back to front 30 ft., and has a clear proscenium opening of 26 ft. square and allowing in height for a fireproof screen, and ventilated and lit by a turret 10 ft. square. The body of the theatre measures in width 46 ft., from back to stage 50 ft., and is in height 40 ft. The theatre provides accommodation for nearly 2,000, and will be lighted throughout with both electric light and gas. The contractor for the work is Mr. Mark Howarth, the decorated plaster work and fireproof steps are by Messrs. Rule, the plumbing by Messrs. Altkin & Austin, and the painting by Messrs. Austin & Sons, all of Sunderland. The scenery is being executed on the premises by Mr. Geo. Collier and his son, Mr. Geo. Collier, jun. The work has been designed and is being carried out under the supervision of Messrs. Wm. & T. R. Milburn, architects, Sunderland. The electric lighting installation is being fitted by Messrs. T. Reid, Ferens, & Co., electrical engineers, Newcastle, under the supervision of Mr. A. Andrews.

WAREHOUSES, NEWCASTLE-ON-TYNE.—New warehouses for a firm of wholesale grocers have been erected in Stowell-street, Newcastle. Mr. Alexander Bruce was the general contractor. The building is fitted with electric lifts by Messrs. Waygood & Co. The lighting is by electricity, the

fittings having been supplied by Messrs. T. G. Usher & Co. Messrs. Henry Walker & Son carried out the steam-heating and hot-water supply arrangements. The architects were Messrs. Bädenoch & Bruce.

BANK PREMISES, TRALEE, CO. KERRY.—New premises for the Munster and Leinster Bank have just been opened at Tralee. Mr. J. B. Healy, of Tralee, was the builder, and Mr. L. A. McDonnell the architect.

BOARD SCHOOLS, HULL.—The foundation-stone of the new schools which the Hull School Board are building in Mersey-street, Holderness-road, was laid on the 3rd inst. The scheme comprises a two-story mixed school in two departments of "junior mixed" for 508 scholars, and "senior mixed" for 508 scholars; also a separate infants' school for 300 children—a total accommodation of 1,316. The two-story main buildings of the mixed school, in the centre of the site, have been designed at right angles to Mersey-street, with its end only facing the street. The building is well removed from the noise of the street by being set back about 40 ft. The juniors are provided for on the ground floor, and the senior department on the first floor. In each case there is a large central hall, surrounded by eight classrooms all entered from the hall. The entrances for boys and girls respectively are at the opposite ends of the building. There are no corridors for mixed children, and the sexes will not be mixed in any way except within the central halls or classrooms where under supervision. The senior mixed school on the first floor is similarly arranged to that of the junior school on the ground floor. The infants' school is arranged in the recessed portion of the site facing the side street, and comprises a central hall surrounded by five classrooms. Ample lavatory and cloakroom accommodation is separately provided for each department. The central halls are placed on the west. Teachers' rooms and book-stores are provided for each department. In addition to the above accommodation there is a special two-story building provided on the Mersey-street frontage as a laundry and cookery centre. The laundry has accommodation for forty-two students and the cookery centre on the first floor for fifty-four students. The buildings will be faced with ordinary hand-made kiln bricks and roofs slated. The floors of the central halls will be of wood blocks laid on concrete. The floors of entrances, corridors, cloakrooms, and lavatories will be of concrete, and staircases of Yorkshire stone. The classroom floors will be of ordinary joists and boarding. The inside walls of entrances, staircases, cloakrooms, and lavatories will be of white glazed bricks from floor to ceiling, and a dado of brown salt glazed bricks will be run round all inside walls of the central halls and classrooms. The seating throughout will be by dual desks. The buildings are being erected by Messrs. J. Houlton & Son, contractors, from the designs and under the supervision of Messrs. Gelder & Kitchen, architects. Mr. J. Tullis is acting as clerk of works. The amount of contract for these buildings is 10,650*l.* The heating and ventilating of the new buildings is being carried out by Messrs. Ashwell & Nesbit, of London. The heating will be by low-pressure steam.

STAINED GLASS AND DECORATION.

WINDOW, ST. MARY'S CHURCH, WOLVERHAMPTON.—A two-light window has been filled with stained glass in the aisle of this church to the memory of the late Queen. The subject of the window is the Passion of our Lord treated in four subjects, with canopies and bases of the Gothic period. On a ribbon on the base is the following inscription:—"To the glory of God and in revered memory of our late most beloved Sovereign Lady Queen Victoria, who fell asleep January 22, 1901. Erected by the St. Mary's Needlework Guild." The work has been carried out by Mr. H. A. Hymers, of Chelsea.

WINDOW, PARISH CHURCH, DONNINGTON WOOD.—A three-light window was lately placed in the east end of the parish church at Donnington Wood, near Newport, to the memory of the late vicar. The subject taken was the Crucifixion, with figures of St. Aidan, St. Matthew, and St. Chad in the base. The window was designed by Mr. T. W. Camm, of Smethwick, Birmingham, and executed at his studio.

FOREIGN.

FRANCE.—The Société Nationale des Architectes has chosen, as programme of its annual competition, the construction of a refuge for the victims of accidents met with in the course of daily work. The competition will be closed on September 5.—The Prefect of the Seine is about to enter into negotiations with the State with a view to the preservation of the platforms of the quays in connexion with the great Exhibition, in order to form a promenade along the river bank; also for the total demolition of the buildings on the Champ de Mars, and the sale of the land bordering Avenue Suffren and Avenue La Bourdonnais.—The Annual Congress of the Sociétés Artistiques de France will be held on Tuesday, May 28 (the twenty-fifth anniversary of the foundation of the Société), in the Hémicycle of the Ecole des Beaux-Arts.—The jury in the Chena-

yard competition has awarded the prize to M. Lefort, a pupil of M. Paulin, for his design for "The Interior Decoration of a Transatlantic Building."—The town of Flers (Orne) has opened a competition for the rebuilding of the church of St. Germain, at an estimated cost of 680,000 francs.—The family of M. Thiers have presented to the city of Marseilles the house in which the former President of the Republic was born, and which will be made use of as a museum.—The municipality of Lyons is about to erect a "Hôtel des Invalides du Travail," at an estimated cost of 814,000 francs.—The Société des Artistes Indépendants is about to organise an exhibition of painting and sculpture in the large conservatory on the Cours la Reine, now the property of the municipality of Paris.—M. Gaspard George has been elected President of the Société Académique d'Architecture de Lyons, for 1901, and M. Marcel Boille President of the Société des Architectes de Touraine.—The death is announced, at the age of fifty-eight, of M. Edouard Dupire-Rozan, architect, of Roubaix, and a former pupil of Questel and Vaudremier. He was the architect of a number of noteworthy town mansions and country châteaux in the northern district of France, especially in the neighbourhood of Roubaix and Turcoing. He received a medal in the Salon of 1881, and in 1893 the Société Centrale des Architectes awarded him their "Grande Médaille" for domestic architecture.

MISCELLANEOUS.

THE CITY SURVEYOR'S DEPARTMENT, MANCHESTER.—At a meeting of the Manchester City Council recently, the following memorandum and suggestions, prepared by Sir John Harwood, were included in the proceedings of the Town Hall Committee:—"That the architectural and building surveyor's work be removed out of the City Surveyor's office, and all such work be placed in a new department, and that we recommend the employment of a competent architectural and building surveyor, who would be capable of making plans for all plain buildings that might be required for the Corporation; that he should have the entire charge of this office, and should take out the quantities of all buildings, whether they were designed by him or some other architects in the city; that he should prepare and be responsible for all quantities for competitive builders for carrying out such work, and that when the works are finished he should measure up all extra work, and make all deductions which should form a basis of a final settlement for all contracts; to do this a gentleman would be required who has had some considerable training as this is a very important and would be to the Corporation very remunerative work, and save a great deal of friction and misunderstanding. The Committee passed a resolution proposing that the Corporation advertise for an architect and surveyor at a salary of 600*l.* per annum." Councillor Wilson moved, and Councillor Brocklehurst seconded, an amendment proposing that the matter be referred back for further consideration. After discussion, the Lord Mayor said the Committee would further consider the matter, and the proceedings were approved on this understanding.

BUILDING SCHEME, SHEFFIELD.—Some few months ago the City Council of Sheffield appointed a special committee to consider a scheme proposed by Alderman Styling for the utilisation of surplus land belonging to the Corporation in Angel-street, Sheffield. The committee recommend the erection of a block of buildings, to be used as shops and artisans' dwellings, at the corner of Angel-street and King-street, and the borrowing of 11,000*l.* to cover the cost of land and buildings, &c. At a recent meeting of the City Council the minutes of the committee containing this recommendation were confirmed. A report on the subject has been submitted to the committee by Messrs. Gibbs & Flockton, of Sheffield.

FALL OF A PILLAR IN WESTMINSTER ABBEY.—A few weeks ago there was a sudden fall of masonry in Westminster Abbey. Early in the morning a marble shaft, about 4 in. in diameter, fell from one of the windows, through the glazing of a window and a balf. The shaft was broken, and in its fall it shattered two of the hot-water pipes of the Abbey heating apparatus, and damaged to some extent the tomb of Lord Norreys.

DISTRICT SURVEYORSHIP OF WEST HAMSTEAD.—Mr. Rowland Plumbé, F.R.I.E.A., has resigned the office of District Surveyor, under the London Building Act, for the above district.

PROPOSED NEW TOWN HALL, HARROGATE.—The Mayor (Dr. J. A. Myrtle) presided at the monthly meeting of the Harrogate Town Council on the 15th inst., when the question of the provision of a New Council Chamber and Municipal Offices was discussed at some length. The Corporation originally decided to utilise the Promenade Room, which, with the adjuncts, had for many years been used as the Town Hall Theatre. Extensive alterations to the premises were deemed necessary to carry out the scheme, and on October 8 last the Corporation passed a resolution instructing the Town Clerk to make application to the Local Government Board to apply for their sanction to a loan of 8,000*l.* for the new Council Chamber

and office accommodation agreed to. The Corporation having abandoned this scheme, Alderman Chippendale moved that this resolution be rescinded. Councillor Milling seconded. The Mayor, in supporting, said the Corporation were tied to build Municipal Offices and a Town Hall, by act of purchase, on the Town Hall site in Victoria-avenue. The motion was carried unanimously. The Finance Committee reported that they had considered the question of new Municipal Offices, and recommended that Councillors Atkinson, Binns, Dickenson, Judge, and Mudd, be added to the Finance Sub-Committee, which was instructed to consider the requirements to be provided for, and report, and that afterwards competitive designs be invited for the erection of a Town Hall on the Victoria-avenue site.

THE CITY OF LONDON DIRECTORY, 1901.—The thirty-first annual edition of the City of London Directory (Messrs. W. H. & L. Collingridge, Alders gate-street) is accompanied, as usual, by a large and excellent coloured map of the City, which would be more useful if, like the map in the Post Office London Directory, it had been mounted on linen. The Directory, which is an exhaustive guide to the City, and which appears to have been brought well up to date, contains an Official Directory, giving details of the principal Government Offices; Corporation Directory, showing the Aldermen, Common Councillors, &c.; London Hospitals and Charities; City Schools; City Clubs and Institutions; City Churches; Public Buildings, comprising a description of many of the principal buildings in the City; Newspaper Directory; Conveyance Directory, giving the railways with their principal officials, and a complete list of the receiving offices in the City; a Biographical Directory; Livery Companies' Guide, comprising the names of the Masters, Wardens, and Members of the Courts of Assistants of the Livery Companies, with the history of their halls, charters, arms, charities, and schools; Streets Guide; Alphabetical or Commercial Directory; Trades Guide, classified under the various trades or professions, with as few cross references as possible; Public Companies' Directory, &c. The street improvements of the year are indicated in the map, and include the alterations in Lower Thames-street, Jeffreys-square, Threadneedle-street, and other streets of the City of London. The Central London Railway is shown as a line in use, and the Great Northern and City as a railway in course of construction.

CAPITAL AND LABOUR.

EDINBURGH JOINERS.—A meeting of joiners was held in the Music Hall, Edinburgh, on the 10th inst., to discuss certain alterations proposed by the local masters in the working of the by-laws. The proposed alterations include a reduction from 9d. to 8d. per hour, and a suggestion that the date of the expiry of the notice of any alteration in the by-laws be changed from April 15 to June 6. The meeting agreed to accept the masters' suggestion that the proposals be submitted to arbitration, on condition that the present rate of wages and the code of by-laws be adhered to pending the arbitrator's award.

ABERDEEN PLASTERERS.—It was mutually agreed locally by both parties to the dispute in this trade that the wages be reduced from 8*sd.* to 8*d.* per hour instead of 7*sd.* as originally proposed by the employers. The central executive in Glasgow of the Operatives' Union have, however, rejected this compromise, and ordered the men to stand out for 8*sd.* The strike will thus be continued.

END OF PERTH JOINERS' STRIKE.—On the 9th inst. a deputation from the Perth joiners who have been on strike for some time met the employers in the City Café, when the dispute as to the wages was settled. It was agreed that the wages remain at 8*sd.* per hour for the next three months, and afterwards at 8*d.* per hour until April 1, 1902.

BELFAST BUILDING TRADE.—The strike in the Belfast building trade has been settled by arbitration. The Rev. Father McMullen was the arbitrator.

LEGAL.

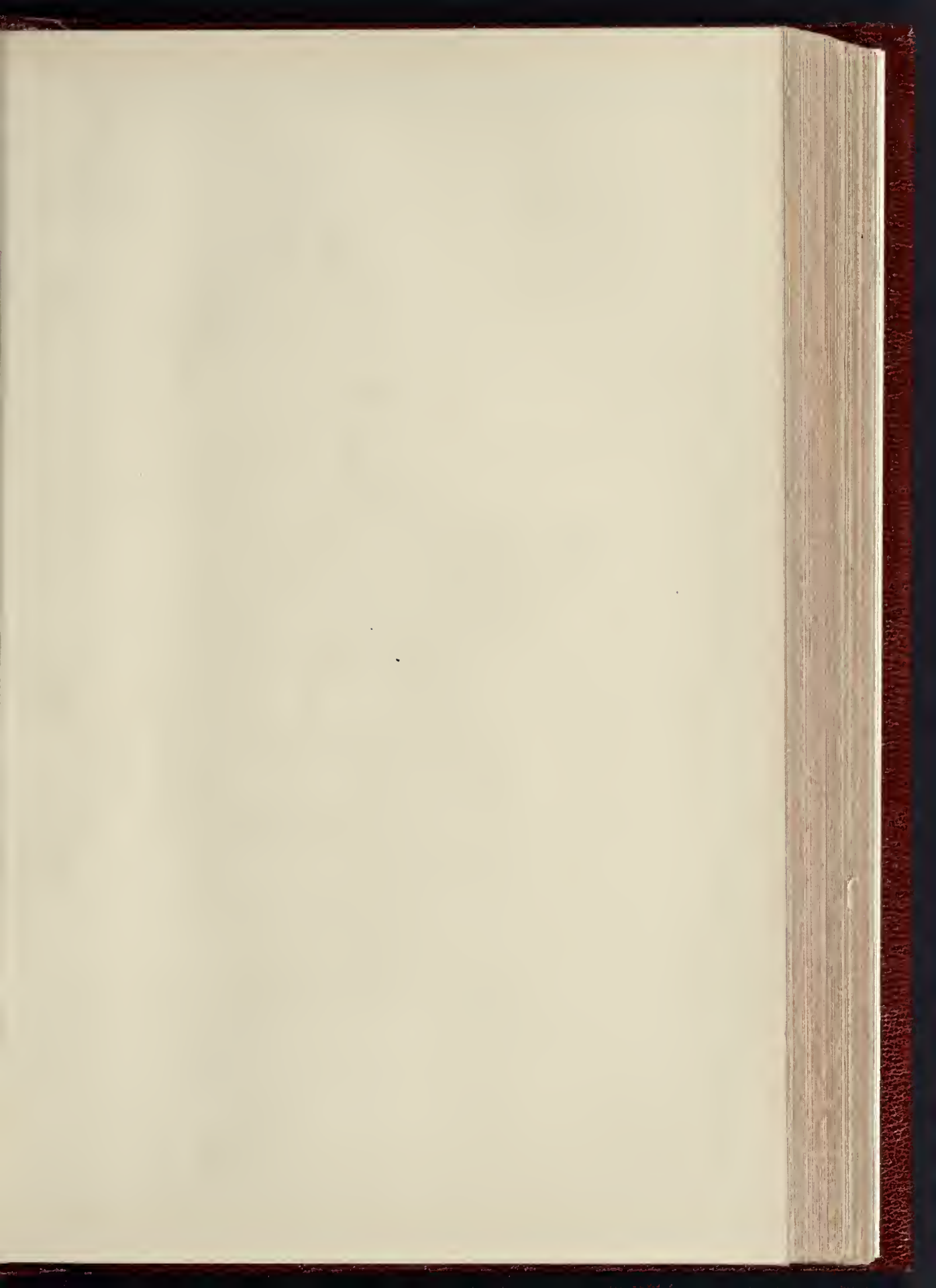
WOODEN STRUCTURES ERECTED WITHOUT LICENCES.

On Thursday, the 11th inst., at Marlborough-street Police-court, six builders were summoned at the instance of the London County Council for having erected wooden structures in various places for viewing the Royal funeral procession on February 2 last, without having obtained licences as required under Part VII. of the London Building Act, 1894. The offence was admitted in each case, and each defendant was fined 5*s.*, with 12*s.* 6*d.* costs. Some of the structures were erected within private grounds, Mr. Fenwick, the learned magistrate, remarking that that made no difference.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

24,875.—GLASS POLISHING AND GRINDING; P Semmer.—The glass is carried by a revolving table over which a set of abrading arms is reciprocated



WALLINGTON HOUSES.

How we use the best of our
 own the Process of Building.

How we use the best of our
 own the Process of Building.

THE BUILDING

APRIL 20 1908

PLAN OF HOUSE

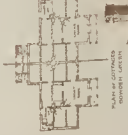


CAMBRIDGE
 HILL AVENUE
 PORTSMOUTH

HOUSE OF THE HILL
 AND THE HILL

THE HOUSE OF THE HILL
 AND THE HILL





HOUSE - DUNSCHEIDT - LEWIS - QUEEN

DUNSCHEIDT HOUSE - HARROW - SCHUBERT

COTTAGE - FLOWERS - HARRIS - PISCHEIDT



HOUSE - 27 WYDE ROAD - HARROW - JAMES L. SMITH

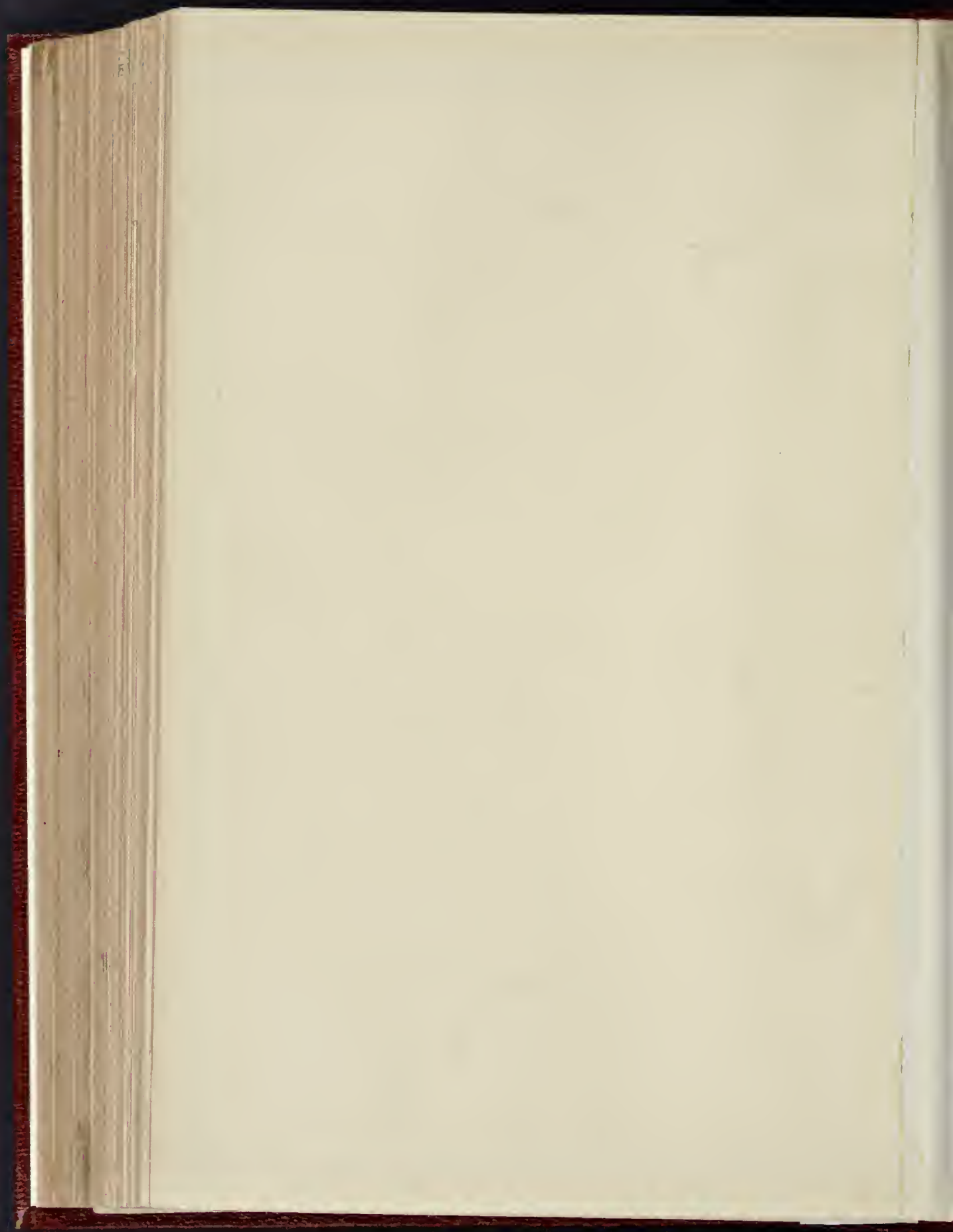


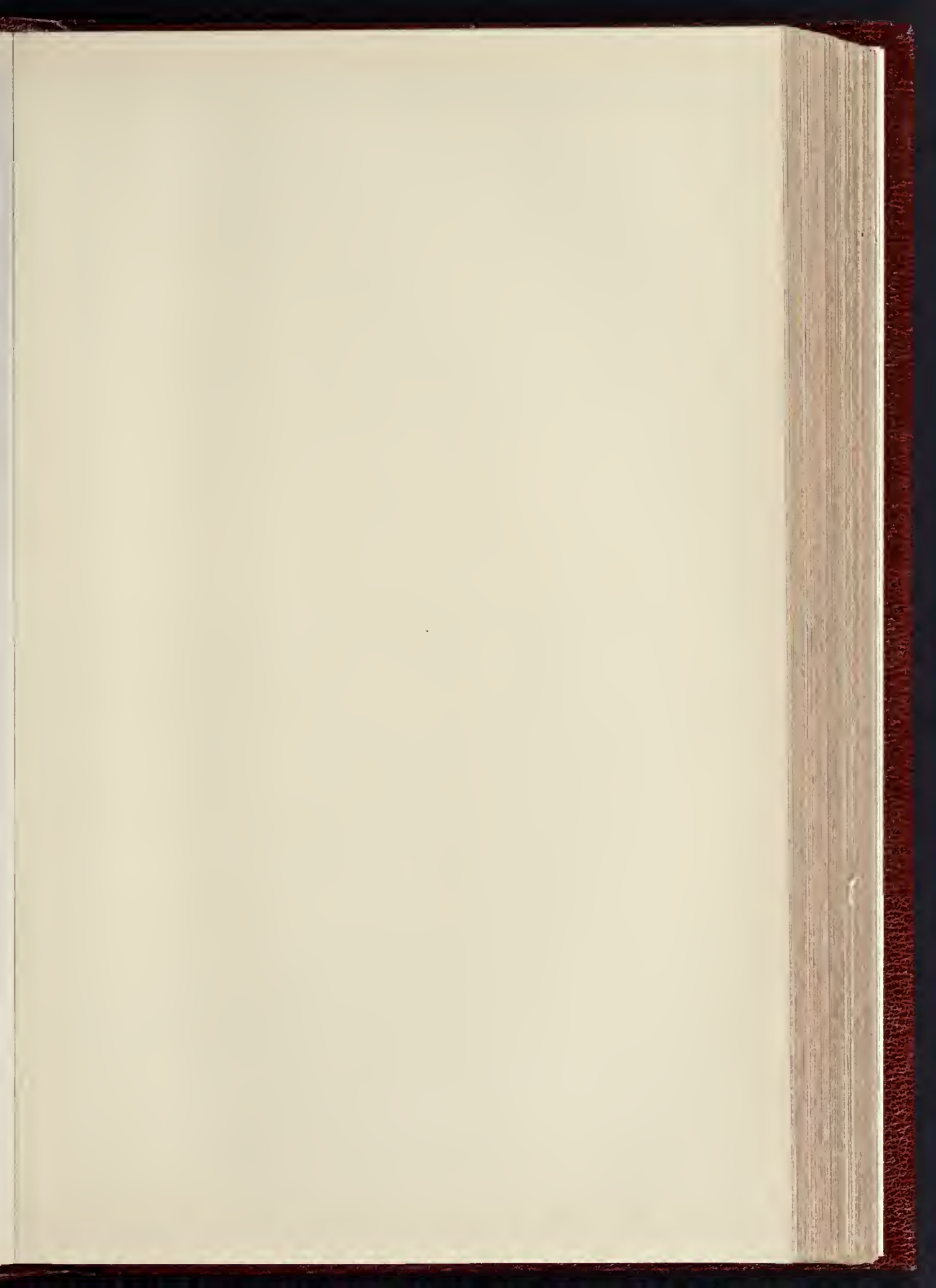
HOUSE - 14 WYDE ROAD - HARROW - JAMES L. SMITH



GARDENERS COTTAGE - HARROW - MR. AGNOLD - NUTCHALL - FRIBBA - ARCHT.

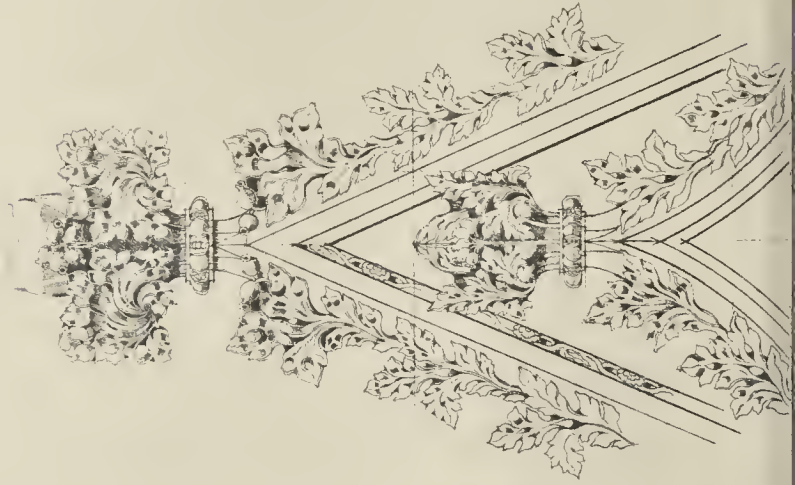
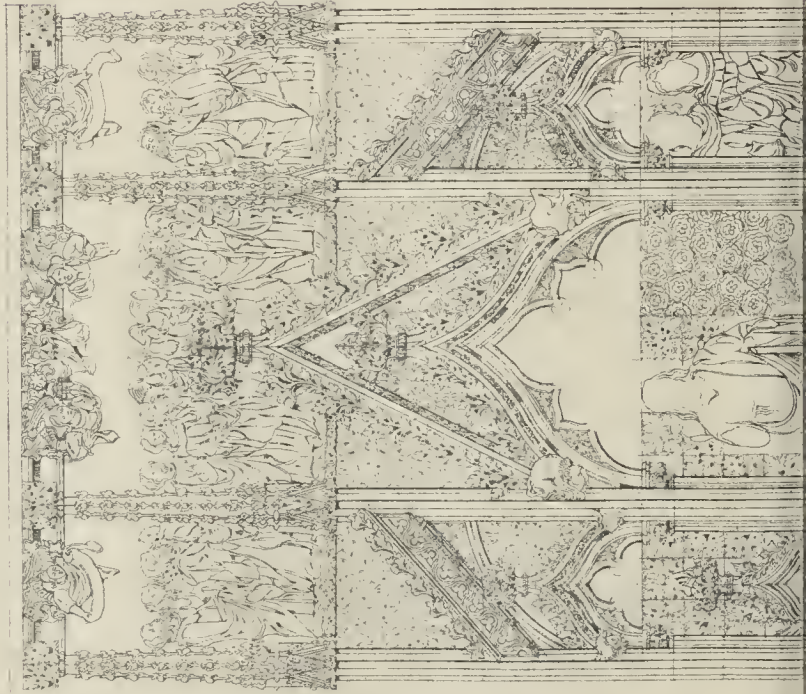






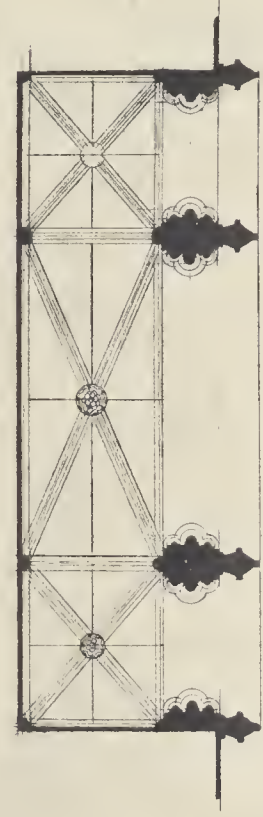
THE BUILDER, APRIL 20, 1901

EASTER SEPULCHRE
HINGTON-BY-NEWMARK
NORMANTS



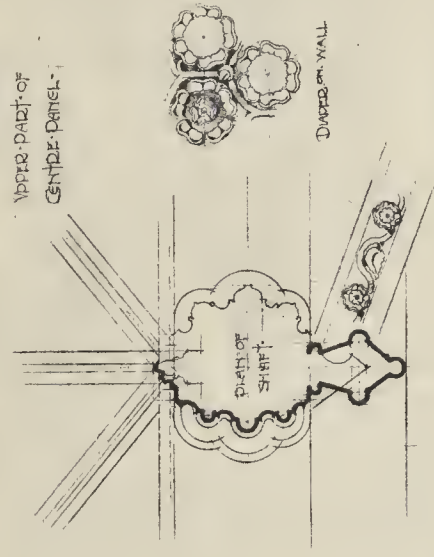


ELEVATION.



PLAN - LOOKING UP.

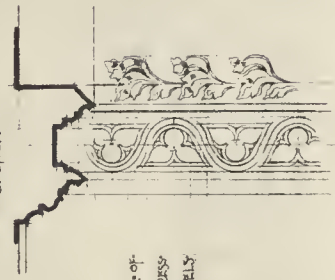
DETAILS OF
UPPER PART OF
CENTRE PANEL.



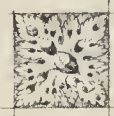
DIPLOMA WALL
FINIAL

THE SHEET IS
BROWN SHEETS CUT
BY GEORGE S. B.
BUT SHEETS ARE
BY J. W. H. B. S.

SECTION.



DETAIL OF
FINIAL FINIAL
IN SIDE PANELS



DIPLOMA WALL FINIAL

THIS DRAWING
IS THE PROPERTY
OF THE ARCHITECT
JULY 1888

with connecting rods and cranks upon a shaft, the ends of the arms being supported with rollers, of which the bearings may be lifted off or lowered upon the work-table with bevel gearing moved with a hand-wheel. Other bevel gearing turns the table whilst the arms are being reciprocated.

24,879.—ARMoured CONDUCTORS (ELECTRICAL): *W. H. Isherwood*.—The conductor is laid upon insulating-rests within a metal tube, which is filled with an insulating material. For a plastic compound may be used an admixture of finely divided paper and shellac wetted with methylated spirit. A finely powdered low-melting glass may be filled in, or a melted compound of mica and shellac. For joining the sections together a sleeve is placed over the exposed ends of the conductors, or the ends may be faced. The sleeve should hold an amalgam of mercury and tin, or some such plastic composition, and a screw-sleeve will serve to draw the ends up to one another.

24,883.—PLUGS FOR WALLS: *J. Fridinger*.—A wooden wall-plug is fashioned with a circular or triangular section. It has a ring attached to its front end, and has a wedge-shaped recess. After the plug has been put into the hole in the wall it is split, and opened out at the back by the forcing in of a flattened bar of wood.

24,926.—A LIFT-VALVE: *F. C. T. Wilham*.—The tap-valve is provided with a facing of some hard fibre or a leaden ring, and is to be screwed on to or off from its inclined seating with a left-hand screw spindle, which is packed with a collar within the cover; a projection from the valve, which engages with a vertical groove cut in the casing, prevents the valve from being turned round.

24,937.—BOOKCASES AND CUPBOARDS: *I. E. Rockwell and J. D. Adams*.—The cases and cupboards are made in sections that may be fitted together by means of strips upon the top of one section that will fit into grooves in the bottom of another section; a hook is affixed to each end of the upper edge of the door, and is caused to slide between strips attached to the ends and spaced with washers, from the bottom of the rabbit at their upper ends. At the drawing out of the door the hooks impinge upon the washers and so form hinges upon which the door will turn.

24,948-50.—CELLINGS, ROOFS, AND TILES FOR ROOFS AND WALLS: *Basel Mission Tile Works*.—The ceilings are built up with ornamental slabs of earthenware (either hollow or solid) held up between the joints with mouldings of earthenware that extend below the ceiling to protect them from fire, and are either nailed beneath them or are rased over battens. For the construction of hollow roofs are devised ceiling or lining tiles fashioned with lower hanging nibs and upper ribs to be used together with weather-proof outer tiles which are hung upon the ribs of the inner tiles. Hollow roofing-tiles are fashioned with interlocking side-edges, hanging nibs, central ribs, and stepped edges (both above and below), which, as they overlap, will make air-spaces to reach from the ridge to the eaves, and to open into side passages of the ridge tiles—the latter tiles having radial flanged ribs and sockets at their ends which will interlock with one another as well as with the roofing-tiles. In the case of tiles for walls, nail-holes and ribs which extend nearly as far as their lower edges, are made in the tiles, which may be fashioned with overlapping edges or be secured, side by side, upon battens.

24,954.—A CONTRIVANCE FOR ROOFING PURPOSES: *C. Thomas*.—The inventor seeks to obviate leakage through the bolt-holes of sheet-metal roofs and similar constructions; between the sheets and the purlins he inserts saddle-pieces which have conical projections that stand up around the bolt-holes, and in order that the water arising from condensation may flow down beneath the sheets he sustains the latter at some interval from the purlins; he fastens the saddle-pieces on to the purlins with screws, or by means of hooked projections on to angle-iron or T-iron purlins, and between the sheets and nuts he inserts concave washers.

24,972.—AN APPLIANCE FOR CASEMENT WINDOWS AND SIMILAR OBJECTS: *J. Campdrill*.—For maintaining a casement window at a distance that can be varied at will, and for keeping or moving toothed gearing, brakes, &c., either in or out of action; a hook is formed with a shank which comprises a spiral part and a straight part that slides within the spiral part and engages with it by means of a loop near its end; the shank may be lengthened or shortened by turning its spiral portion upon the straight portion around its axis of rotation.

24,973.—AUTOMATIC WATER-SPRINKLERS: *G. W. Beldau and W. S. Cotes*.—For sustaining the sprinkler valve is employed a ball (having a spreader underneath it) of some combustible material, such as celluloid, which holds the valve against its seating, being pressed with a screw that passes through the base of the holding-bracket, which is enclosed within a case made of celluloid. The valve and its seating should be made of lignum-vite, and a fusible plug can be employed together with the ball of celluloid, whilst other shapes than that of a ball may be adopted.

24,993.—A FLUSHING CONTRIVANCE: *J. West*.—This contrivance is intended for use with a flushing apparatus wherein the operation of a piston within a cylinder that is attached to the shorter leg of the siphon serves to start the flush. The inventor

places the cylinder and the shorter leg of the siphon inside an elbow-piece provided with an inlet in the shape of a bell or an oblong, he fixes a plate for directing into the siphon the water that is forced out of the cylinder, so that the flush shall enter through the inlet of the elbow-piece.

24,997.—COCKS FOR WATER TAPS: *H. H. F. M. Parlow*.—A self-closing cock comprises the casing of a self-closing valve, against which a spring forces the valve, that can be opened by pushing down a knob. A row of strainers is fitted within the nozzle, and to obviate the effects of frost, a small current of water is caused to flow through a little auxiliary cock during the cold weather.

25,006.—A PLASTIC COMPOUND: *F. G. Kleinsteuber*.—A composition adapted for articles, especially electrical insulators, that are exposed to vibratory action, is made of asbestos or mica (as a filling substance) mixed with copal solution or some such resin in warmed turpentine, benzine, or other spirit, together with Chinese wood oil, and, it may be, dammar resin and rosemary oil in small quantities.

25,010.—AN INDICATOR FOR ELECTRICAL CUT-OUTS: *Siemens and Halske A. G.*—For showing when enclosed main fuses have become consumed, the inventors devise a small supplementary and visible fuse. In one form of the contrivance they completely enclose the main fuse in one of the two compartments, against which a spring force the fuse, which is provided with a sight-hole—the latter fuse will burn as soon as the main fuse has burned.

25,028.—LATHING OF METAL: *International Metal Lath Company*.—Alternating slits are cut in opposite directions in blank sheets, which have plain ribs or strips that will be strengthened by means of the engagement of the ends of the slits of one series with the ends of the slits of the next adjoining series when the sheets are opened out; the slits may be grooved and set, approximately, in the plane of the sheet, or they may be turned at nearly 90 deg.; so, similarly, the slits that project at 90 deg. from the ribs may be inclined to the plane of the sheet or be turned into or parallel to that plane; the sheets are intended for use in plastering and lathing work, for screens, gratings, and similar purposes.

25,089.—A METHOD OF DRYING BRICKS: *A. H. Beasley, I. W. Beasley, and A. H. Beasley*.—Tongues are formed in the back-covers, which consist of corrugated iron or steel sheets curved for wooden crossbars that are fastened with nails or screws and are laid upon the tops of the bricks as they are being dried. In another form metal crossbars are used and are fastened with rivets to the back-covers.

25,139.—THE CASTING OF SHEET-GLASS: *P. T. Siewert*.—For the process of rolling the molten glass the inventor substitutes means of shaking the plate or table, around which is fixed a ledge or rim for preventing the liquid glass from running over. The plate, which may be hollow, should be made of some non-conducting substance—such as asbestos, wood, or refractory clay—and apertures may be made in its upper surface for the supply of water to the layer of fibrous material over which the glass is poured.

25,140.—IRON RAILINGS: *E. M. Edwards*.—Cast-iron panels are fashioned with lugs or extension pieces that will engage with sockets in the standards or the intermediate panels, pins and wedges or wrought-iron bars being employed for fastening purposes.

25,145.—AN APPLIANCE FOR USE WITH WOODEN BLOCK PAVEMENTS AND FLOORS: *W. Shoosmith*.—The inventor's object is to afford allowance for contraction and expansion of the wooden blocks; he inserts metal springs or blocks of some elastic material between the rows of the blocks and fills the joints with a mixture of tar, pitch, sawdust, or sand; he also lays strips of rubber or some such elastic substance between the blocks recessed for the purpose in order that the strips, under pressure, may become expanded into the grooves or recesses.

25,179.—MEANS OF EXTINGUISHING FIRE: *F. Diesfeld and B. Baer*.—Liquid is kept under air pressure within a container of which the discharge-pipe is closed at its top with a screw-down valve which also serves to shut the outlet to the hose-pipe, a steeve-valve is arranged for shutting the inner end of the passage through which air is pumped into the receiver on to which a cap is screwed after the pump has been taken out.

25,200.—ELECTRICITY METERS: *W. H. Johnson*.—Series and shunt electro-magnets are employed to rotate, and a shunt electro-magnet retards, the conducting-body of an alternating-current induction meter for an active current that may be applied as an energy meter upon constant pressure mains; two laminated magnets, having four coils connected in series between terminals and the two supply mains, is passed at two diametrically-opposite parts a conducting disc which is driven by poles of the magnets and by two coils of copper strip disposed near the poles and connected between terminals in one main, whilst the opposite poles will retard it; a vertical spindle, geared to a counter, supports the disc, and clips upon plates screwed on to a back-plate support the two laminated magnets.

25,215.—A FLOOR COVERING FOR INSULATING PURPOSES: *G. E. Hey-Die*.—The floor covering, intended for use in accumulator-rooms, transformer-chambers, and so on, is composed of ordinary or

waterproofed paper sheets and sheets of india-rubber, which are vulcanised and calendered. For the india-rubber may be substituted any suitable material compounded with pitch, French chalk, oxide of zinc, cork, barytes, &c.

25,250.—BRICKS: *J. Holroyd and R. Bond*.—For glazed bricks to be used in building walls which shall present a glazed surface on each side, the inventors devise a header, which consists of two adjustable portions that can be joined together with overlapping tongues, the two parts having holes or recesses for the keys of mortar. The half bricks may be glazed upon only their outer surfaces.

25,320.—GULLY TRAPS: *H. Brauner*.—A removable attachment, in the shape of an inverted siphon, constitutes the outlet of the body of the trap, and immediately above the siphon rests a sludge-box, into which the water (from the drain above) flows through holes in the cover and out of which it flows through holes in the sides to beneath the shorter leg of the siphon below.

MEETINGS.

FRIDAY, APRIL 19.

Architectural Association.—Mr. M. A. Green on "The Eighteenth Century Architecture of Bath" (illustrated by lantern views). 7:30 p.m.

Institution of Mechanical Engineers.—Ordinary General Meeting. Presidential Address by Mr. William H. Mau. 8 p.m.

Royal Institution.—Professor J. J. Thomson, M.A., on "The Existence of Bodies Smaller than Atoms." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. E. V. Clark, B.Sc., on "The Theory of Cast-Iron Beams." 8 p.m.

Building Trades' Exhibition.—Visit of the Institute of Builders.

SATURDAY, APRIL 20.

Architectural Association.—Visit to the International Building Trades Exhibition, Agricultural Hall. 3 p.m.

Edinburgh Architectural Association.—Visit to Duddinghouse and Church, and Chapter House at Restalrig.

British Institute of Certified Carpenters.—Visit to the Building Trades Exhibition. 3 p.m.

MONDAY, APRIL 21.

Royal Institute of British Architects.—Mr. Francis Bond, M.A., on "The Classifications of Romanesque and Gothic Architecture." Illustrations will be shown by lantern slides. 8 p.m.

Society of Arts (Cantor Lectures).—Sir William Chandler Roberts-Austen on "Alloys." I. 8 p.m.

TUESDAY, APRIL 23.

Institution of Civil Engineers.—Paper to be further discussed, "Modern Practice in the Manufacture and Distribution of Gas." By Mr. Harry E. Jones. 8 p.m.

WEDNESDAY, APRIL 24.

Society of Arts.—Mr. Alexander Siemens on "Patent Law Reform." 8 p.m.

Edinburgh Architectural Society.—Address by Hon. President (Mr. H. O. Tarbolton) and Award of Prizes in Competitions.

Building Trades' Exhibition.—Visit of the Institute of Sanitary Engineers.

Institution of Civil Engineers.—Students' visit to the shipbuilding department of the Thames Iron Works, Shipbuilding and Engineering Company, Limited. (Assemble at the works, Orchard Yard, Blackwall, E. Train from Fenchurch-street to Blackwall, 2.25 p.m.) 3 p.m.

THURSDAY, APRIL 25.

Institution of Civil Engineers (The Ninth "James Forrest" Lecture).—Professor F. Clowes, D.Sc., on "Chemistry in its Relations to Engineering." 8 p.m.

Royal Institution.—Mr. R. Fry on "Naturalism in Italian Painting." II. 3 p.m.

Society for the Encouragement of the Fine Arts.—Dr. Todhunter on "Some Pictures in the National Collection."

Institution of Junior Engineers (Westminster Palace Hotel).—Sixth and concluding lecture on "Works Management," by Mr. A. H. Barker, Wh.Sc., B.A., B.Sc. 8 p.m.

Building Trades' Exhibition.—Annual meeting and dinner of Institute of Clayworkers.

FRIDAY, APRIL 26.

Society of Arts (Howard Lectures).—Mr. Alfred C. Ehorah on "Polyphase Electric Working." I. 8 p.m.

Glasgow Architectural Craftsmen's Society. Business meeting. 8 p.m.

Building Trades' Exhibition.—Conference on standardising of bricks.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 3.—By Messrs. SHELMAN (at Norwich).

Norwich.—Heigham-st., a freehold shoeing-Forge, r. 25l.	£400
St. George's-alley, freehold house and shop, r. 25l.	350
41 and 46, William-st., f. r. 124.	850
Duke-st., a freehold residence, r. 42l.	155
55, Colegate-st., f. r. 124.	160
4, Muspole-st. and shop adjoining, f. r. 200.	405
Muspole-st., stable and yard, f. r. 200.	370
Sprouton, seven freehold cottages.	By RAWLINS & Co. (at Ilford).
Ilford, Essex.—Glencoe-av., &c., 60 plots of freehold building land.	8,956

[See also page 401.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Schools	Aldershot School Board	See Advertisement.	May 27
*Fire Station, &c.	Manchester Corporation	300l., 200l. and 100l.	July 31

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
House, Middlehill, Aberdeen		J. Duncan & Son, Architects, Turfiff	April 23
Warehouse, Fairweather Green, Bradford		A. Sharp, Architect, Market-street, Bradford	do.
Cotton Mill, &c., Brighouse	Messrs. A. Hardman & Son, Ltd.	Sharp & Walker, Architects, 32, Bradford-road, Beighouse	do.
Additions to Schools, Hanover-terrace	Brighton & Preston U.D.C. Sch. Bd.	Johnson & Son, Architects, 15, Ship-street, Brighton	do.
Sea Wall, Dawlish	Great Western Railway Company	G. K. Mills, Paddington Station, London	do.
Two Cottages, Rogerstone, Newport, Mon.	do.	do.	do.
Cast-iron Pipes, &c.	Leeds Corporation	R. H. Townsley, Municipal Offices, Leeds	do.
Private Improvement Works, Grimshaw-street	Boothf. (Lancs) Corporation	Surveyor, Council Offices, Barrowford	do.
Bridge, Pontesaid	Northumberland County Council	County Surveyor, Moor Hall, Newcastle	do.
Sewers, &c.	Keighley R.D.C.	Barber, Hopkinson & Co., Civil Engineers, Keighley	do.
Road Works, Balfour-road, &c.	Croydon Town Council	Borough Surveyor, Town Hall, Croydon	do.
Works at Workhouse, Beckett-street	Leeds Guardians	J. B. Abbey & Son, Architects, 34A, New-street, Huddersfield	do.
Three Dwellings, Moor End, Lockwood	Coventry Hospital Committee	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	April 24
Works, &c., at Hospital	Ashton-under-Lyne Guardians	J. Eaton & Co., Architects, Ashton-under-Lyne	do.
Additions to Workhouse	Irlam (Lancs) U.D.C.	J. J. Longson, Architect, Bakewell, Derby	do.
Factory, Stoney Middleton, Sheffield	Birkenhead Corporation	G. H. Kay, Surveyor, Council Offices, Irlam	do.
Surveyor's Materials	Edinburgh School Board	C. Brownidge, Civil Engineer, Town Hall, Birkenhead	do.
Street Works, Ashley-street, &c.	Rev. J. Lyon	R. Wilson, Architect, 3, Queen-street, Edinburgh	do.
School, Ashley-terrace		D. Ross, Surveyor, Kirriemuir	do.
Cottage, Kirkton, Glenisla, N.B.		S. E. Giese, Architect, Carrickfergus	do.
Manse, Carrickfergus, Ireland		F. H. Livesay, Architect, 107, Newgate-street, Bishop Auckland	do.
Club Premises, Crook, Durham		Barber, Hopkinson & Co., Craven Bank Chambers, Keighley	do.
Road Works, Steeton, Kelghley	Barrowford (Lancs) U.D.C.	H. Stead, Architect, Heckmondwike	do.
Additions to Moor End Mills, Dewsbury Moor	Mr. S. Broadbent	W. C. Williams, Architect, 29, Southgate, Halifax	April 25
Granite Road Metal, &c.	The Trustees	A. E. Lambert, Architect, 22, Park-row, Nottingham	do.
Villa, Hatchet, Pellon, Halifax	Lancashire Asylums Board	J. Melvin & Son, Architects, Mar-street, Alloa, N.B.	do.
Wesleyan Church, West Bridgford	Mr. P. Cumming	D. & J. R. McMillan, Architects, 211, Union-street, Aberdeen	do.
Additions to Laundry at Hospital, Clackmannan	Bristol Corporation	H. F. Proctor, City Engineer, Temple Back, Bristol	do.
Cottage, Rainhill	Stockton School Board	E. A. Whipham, 69, High-street, Stockton	April 26
Villa, Station-road, Keith, N.B.	Chesterfield Board	J. Sharp, Surveyor, 5, Sunnyside, Borough Green	do.
Underground Sub-station		A. M. Mackenzie, Architect, 343, Union-street, Aberdeen	do.
*Schools, &c.	Brighton Town Council	Austin & Paley, Architects, Lancaster	do.
Sewerage Works, Middleton, Harpe	Halifax Corporation	F. J. Tillstone, Town Hall, Brighton	do.
Church, Greyfriars, Aberdeen	West Hartlepool Corporation	J. Lord, Civil Engineer, Town Hall, Halifax	do.
Additions to Church, High Bentham, Lancaster	St. George-in-the-East Guardians	J. W. Brown, Borough Engineer, Town Hall	do.
Iron and Steel Work, Southwick	Wrotham (Kent) U.D.C.	See Advertisement	do.
Two Houses and Two Shops, Halifax	Rhymney No. 1 Building Club	T. Rodrick, Architect, Clifton-road, Aberdare	April 27
Walling, &c., at Haley Hill	Glyndwr Building Club	W. & S. Owen, Architects, Warrington	do.
Sewers, &c., Musgrave-street	Warrington Guardians	H. C. Hunson, Surveyor, Theatre-street, East Dereham	do.
*Painting, &c.	East Dereham U.D.C.	F. Entwistle, Town Hall, Middleton	do.
Twelve Workmen's Dwellings	Middleton (Lancs) Corporation	Carby, Hall, & Dalby, Architects, Park-row, Leeds	do.
Fifty-three Houses	Cockermouth R.D.C.	J. B. Wilson, Civil Engineer, Court-buildings, Cockermouth	do.
Twenty-eight Houses, Aberaman	Romford R.D.C.	G. Logwood, Highway Surveyor, North-street, Romford	April 29
Offices and Residence, Earlestown	Hastings Corporation	R. P. Palmer, Civil Engineer, Town Hall, Hastings	do.
Granite Road Metal (700 tons)	Aberdeen Harbour Commissioners	A. G. Nicol, Engineer, Harbour Offices, Aberdeen	do.
Refuse Destructor, &c.	Caledonian Railway Company	J. Blackburn, 302, Buchanan-street, Glasgow	do.
Schools, Church-street, Whitley	Hanley (Staffs) Corporation	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
Rebuilding Bridge Stair, Keswick	Stromnes (N.B.) Town Council	J. Lobbey, Borough Engineer, Town Hall, Hanley	do.
*Framing	Thornhill (Yorks) U.D.C.	W. E. Copland, Engineer, 145, West Regent-street, Glasgow	do.
Granite Kerbing	London County Council	S. W. Packer, Surveyor, Council Offices	do.
Shed, Regent Quay	U.D. School Board	Architect's Department, County Hall, Spring-gardens, S.W.	April 30
Station Buildings, Upper Greenock	Camberwell Borough Council	See Advertisement	do.
Chapel, Washer-lane, Halifax	Litherland (Lancs) U.D.C.	W. B. Garton, Surveyor, 25, Sefton-road, Litherland	do.
Sewerage Works, Leek-road	Ashford (Kent) U.D.C.	W. Terrill, Surveyor, North-street, Ashford	May 1
Sewerage Works	Hornsey U.D.C.	Engineer, Council Offices, Southwood-lane, Highgate, N.	May 3
Sewage Purification Works	Crewe Town Council	G. Eaton Shore, Borough Surveyor, Earle-street, Crewe	May 6
*Home for Female Inebriates	West Ham School Board	W. Jacques, 2, Fen-court, E.C.	May 7
Additions to Schools, Woolston, Hants	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
*Underground Convenience	Lichfield Grammar School	H. H. Brown, 1, Bird-street, Lichfield	May 11
Passage Works	Abingdon School Board	Offices, 33, Bath-street, Abingdon	May 14
Road Metal	Leeds Corporation	See Advertisement	May 22
Sewering, Levelling, &c.		Sidney, Mitchell, & Wilson, Architects, 13, Young-st., Edinburgh	No date
Street Works, Hammond-street and others		E. Jones, 7, Bailey-street, Deri, Cardiff	do.
*Cleansing, &c.	Messrs. J. Tetley & Son, Limited	F. W. Ridgway, Architect, Dewsbury	do.
*Boundary Wall and Fencing	Carlisle South End Co-op. Soc., Ltd.	W. Pogson, Architect, Devonshire-street, Carlisle	do.
*School	Workington Guardians	Oliver & Dodgshun, Architects, Carlisle	do.
*Market Hall, &c.		Davis & Co., 33, South-side-street, Plymouth	do.
Three Cottages, Melrose, Roxburgh		W. Wright, Architect, 6, Westgate, Wakefield	do.
Chapel, Morecambe		J. F. Walsh & Co., Architects, L. & Y. Bank-chambers, Halifax	do.
House and Shop, Deri, Cardiff		H. C. Fread, Architect, Walton-road, East Molesey	do.
Rebuilding Market House Inn, Dewsbury	Mr. A. Jermyn	H. Green, Architect, Paradise-parade, King's Lynn	do.
Two Shops, Appley	Lelsdon (Wolverhampton) E.D.C.	W. Cannon, Surveyor, Wombourne	do.
Additions to Infirmary			do.
Two Cottages, Prawle Point, Devon			do.
Two Villas, Sandal, near Wakefield			do.
Two Houses, Dry Clough-lane, Sallerhebble, Yorks			do.
Five Cottages, High-street, West Molesey			do.
Additions to Villa, Hunstanton			do.
Stone, &c., Wombourne			do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
Inspector of Nuisances	Stroud U.D.C.	100l. per annum	do.
Clerk of Works	Hambleton U.D.C.	3l. 3s. per week	April 23
Lecturer	Swansea Tech. Instruction Comm.	120l. per annum	do.
Clerk of Works	Wanstead U.D.C.	3l. 3s. per week	May 13
			No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. vii. x. & xxii. Public Appointments, pp. xix. & xxii.

Table listing various properties and their values, including 'April 9.—By Messrs. Cobb (at Rochester). Higham, Kent.—A piece of garden ground, o. a. £ 30 p. f. 250' and 'April 11.—By C. C. & T. MOORE. Mile End—9 and 10, St. Peter's-st., u.t. 29 yds. 600'

Contracts used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rent; u. for unexpired term; p.a. for per annum; y.s. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table of material prices including 'BRICKS, &c.' (Hard Stocks, Rough Stocks, etc.), 'STONE' (Ancaster in blocks, Bath, etc.), and 'IRON' (Common Bars, Staffordshire Crown Bars, etc.).

PRICES CURRENT (Continued).

Table for 'STONE' and 'IRON' prices, including 'Hard York 6 in. sawn both sides landings, to sizes 2 8' and 'Common Bars'.

Table for 'SLATES' and 'TILES' prices, including '20x10 best blue Bangor' and 'Best plain red roofing tiles'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: best 3 in. by 11 in. and 4 in.' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

Table for 'WOOD' and 'BUILDING WOOD—YELLOW' prices, including 'Deals: second' and 'Fir timber: Best middling'.

PRICES CURRENT (Continued).

Table for 'METALS' prices, including 'Iron.—Common Bars' and 'Staffordshire Crown Bars'.

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TO CORRESPONDENTS. H. & H. (Too late; next week). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

CIRENCESTER.—For rebuilding the Plume of Feathers Inn, Watermoor-road, for Messrs. T. & J. Arkell, Kingsdown Brewery, Messrs. Wm. Drew & Sons, architects, Regent Circus, Swindon. Quantities by the architects:—

G. F. & E. Newcombe, Cirencester* £1,391
Five tenders received.

HIGHWORTH (Wills).—For new clubroom, and alterations to the Saracen's Head Hotel, for Messrs. T. & J. Arkell, of Kingsdown Brewery, Messrs. Wm. Drew & Sons, architects, Regent Circus, Swindon:—

A. J. Colborne, Swindon* £674 10 6
Four tenders received.

LEEDS.—For additions to the workhouse, Beckett-street, for the Union Guardians. Messrs. T. Winn & Sons, architects, 92, Albion-street, Leeds. Quantities by architects:—

Brickwork and Masonry. L s. d.
J. T. Wright, Skinner-lane, Leeds.. 5.370 0 0

Carpentry and Joinery.
J. Ingleson, Burnmoots, Leeds... 1,189 10 0

Plumbing and Glazing.
H. Lindley, Neville-street, Leeds .. 338 0 0

Plasterwork.
Cordingley & Son, Bradford..... 200 0 0

Ironwork.
Newsome, Askham, & Co., Batley Carr 175 10 0

Concrete.
S. McFarlane, Cookridge-st., Leeds 107 14 0

Slating.
W. Atkinson, Kirkstall-road, Leeds 181 28 0

Painting.
A. Bateman, St. Columba-st., Leeds 78 13 9

Heating Apparatus.
Braithwaite & Co., Swinegate, Leeds 213 15 0

Wood Block Flooring.
Geary, Walker, & Co., Queen Victoria-street, London 291 0 0

Ventilating.
Boyle & Sons, London 43 7 0

C. B. N. SNEWIN & SONS, Ld.

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LEEDS.—For the erection of a bandstand, North-street Recreation Ground, for the Corporation:—

Bandstand (Superstructure).

McDowall, Steven, & Co., Ltd., Milton Ironworks, Glasgow* £345 0

Bandstand (Foundations).

A. Lambert, Bramley, Leeds* 243 10

RISCA (Mon.).—For the erection of additions to the Risca Town Schools, for the Risca School Board. Mr. Geo. Rosser, architect, Risca, Mon.:—

J. Lewis £1,179 10 0
Leadhater Bros. 1,083 0 0
J. Pritchard, Pontystymer, Mon.* £1,055 0

WAYBOURNE.—For the Waybourne Springs Hotel, Waybourne-on-Sea, Norfolk. Mr. R. W. W. Carter, architect and surveyor, Cromer and Sheringham:—

Chapman £6,700 0
Francis Thoday & Co. £5,767 0
Hipwell & Co. £5,767 0
Rands 5,739 10
Lines 5,694 0
Chapman 5,579 0
Porter 5,554 0
Collins 5,500 0
Towler 5,290 0
Shanks 5,140 0
Bayard 5,100 0
Riches 5,090 0
Neale, Baconson, & Scarles 5,787 0
Thorpe* 5,333 0

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ILLUSTRATIONS.

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Old Architecture of Bath (in Illustration of Mr. Green's Paper).....	Double-Page Ink Photo.
Sketches in Whitby.—By Mr. G. W. Collins	Double-Page Ink Photo.

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A New Dictionary of Architecture.



DICTIONARY of Architecture may take two or three different forms. It may be, as in the case of "Gwilt" (which indeed is called an "encyclopædia"), a didactic work professing to include

in one publication the outlines of all subjects of study which bear upon architecture and building. "Gwilt" is in fact a collection of artistic, scientific and historical treatises; and a wonderful volume it is in respect of the amount, variety, and generally reliable character of the information contained in it. But it wants the feature of alphabetical arrangement, which is one of the proper qualifications of an encyclopædia; and though this want is atoned for by a very good index, a book so arranged hardly comes into the category implied by its title. Then we may have, as in the "Dictionary of Architecture," a work alphabetically arranged, which aims at giving a short essay on each important subject named, but rather avoids smaller subjects and brief definitions. In this respect the "Dictionary of Architecture" bears more properly the character of an "encyclopædia," and should rather have been so entitled. It is a great piece of work, and remarkably accurate as a rule, but is of course out of date now in regard to a good many subjects connected with structure and material; and it is now out of print. It represents, however, such a large body of information, and affords such a fine basis for a new edition brought up to date, that one is surprised that no such attempt should have been proposed.

Mr. Russell Sturgis, the able editor of the new dictionary which comes to us from America,* recognises in his preface the existence of the "Dictionary of Architecture"

as the only such dictionary in the English language: "Apart from this there are only glossaries, and those avowedly partial and limited in character." He does not allude, however, to the fact of the "Dictionary" being out of print, and leaves the reader rather to suppose that he considers it insufficient. In a certain sense it is, but it might have claimed a word of recognition as a remarkable work of its class. Mr. Sturgis's dictionary is on different lines and is more distinctly a dictionary in the most general sense of the word, viz., a book in which explanations of terms in architecture can be readily found, and which is strictly alphabetical in its distribution. It includes essays at some length on the larger subjects which come within its scope; but the majority of the articles are short and aim merely at defining a term and, when necessary, amplifying and illustrating the definition. An important point in the work is the large use made of cross-references. Thus, under "Columnar architecture" there are cross-references to "Distyle," "Tetrastyle," "Hexastyle," "Octastyle," "Peristyle," "Peripteral," "Dipteral," and several others; and one value of this system is, as remarked in the preface, that it serves to recall to the reader a term in connexion with the main subject which he may have forgotten, and therefore would not know immediately where to look for in the "Dictionary"; the cross-reference under the main heading reminds him of the word he wants and also shows under what letter to find it.

In regard to all these matters of clearness of arrangement the dictionary appears to be most admirably and systematically carried out, and likely to be the most useful one for reference on short notice which has been produced. It has the merit also—never found in a French architectural dictionary and hardly to the same extent in an English one—of being essentially cosmopolitan in its scope. The illustrations are numerous and very well executed; the majority are in the shape of comparatively small cuts on the page; there appears to have been some difficulty in placing them always in immediate connexion with the articles they illustrate, owing to the number of the illustrations and the shortness of some of the articles; so that there is rather a confusion in some places between the text and the

illustrations; but the inconvenience is only occasional. Besides the text illustrations, the first volume contains thirty-six separate plates of important buildings; and as these include the Abbaye aux Hommes, the Certosa, Canterbury Cathedral, the Natural History Museum, London, and the Bourse, Paris, it will be seen that the selection is made in a wide spirit.

The contributors to the dictionary, besides the editor (who is a large contributor, and of course a most capable one) are mostly American architects, engineers, and other specialists; the list includes, however, four English contributors—Mr. Brewer, Mr. Alexander Graham, Mr. Lethaby, and Mr. R. Phené Spiers; two Frenchmen—M. A. Sandier, the Art-Director of Sèvres, and M. J. Schopfer of Paris; one Canadian—Mr. Taylor, of Montreal; and one contributor, Mr. Fiske, who resides at Alassio (Genoa), and may therefore be counted as an Italian contributor.

The present volume of the dictionary carries us as far as the end of letter E, and it is natural for us to look first to the treatment in it of any subjects that are especially English. The principal among these, of course, is "England—Architecture of," which is written by Mr. R. Clipstone Sturgis. This is on the whole a very fair view of English architecture. In speaking of English mediæval architecture the author recognises, as other visitors to England have done, the instinct which the English architects had for the picturesque placing of the cathedrals. While pointing out, however, the points in which English mediæval architecture was less bold and less complete in its system than French, he fails (like every foreign critic as far as we have observed), to note the superiority of English mouldings to French. The profiling of English mouldings in mediæval work, considering the difference of the material in which they were to be executed, is almost as refined and as worthy of study as that of Greek mouldings; a fact which neither French nor American writers on architecture seem ever to have recognised. The author does justice to the fine and important feature made by the central tower in English Gothic; an effect which was rendered impossible to the French architects by the height to which they carried the nave, which left no opportunity

* "A Dictionary of Architecture and Building—Biographical, Historical, and Descriptive." By Russell Sturgis, A.M., Ph.D., and many architects, painters, engineers, and other expert writers, American and foreign. In three volumes, Vol. I. A—E. New York: The Macmillan Company. London: Macmillan & Co. 1901

for a tower that would dominate the composition. In comparing the French and English Gothic, the author emphasises the fact that the French were more systematic and complete in their treatment of vaulted structure, sacrificing everything else to that, reducing their walls between the buttresses almost entirely to openings, and making immense masses of the buttresses; but though this system is more scientifically and logically complete, there is surely the question whether, in regard to architectural beauty, the French did not over-do this, and whether their cathedrals do not become too much like stone scaffolding—works of engineering rather than of architecture. Mr. Sturgis, indeed, seems to admit that there is a spirit of beauty in English Gothic which is hardly to be found to the same extent in French; though he makes the admission in rather a passing and left-handed manner.

Again, the following comparison is surely open to much question:—

"French builders recognised the three-fold plan, and terminated the nave with a wondrous portal and the aisles with vast towers. England almost invariably disregarded both plan and section, and built her west fronts as screens, which masked, rather than expressed, the building."

Now, in the first place, "almost invariably" is quite overstating the case. In fact, there are only three cathedrals in which the screen system is carried out in the sense implied in the above quotation—Peterborough, Salisbury, and Lincoln. The principle of the two towers marking the ends of the aisles, with the nave wall between them, is carried out at York, Durham, Westminster (where the towers were intended though not completed), Canterbury, Lichfield, Southwell, and Ripon; at Ely the triple plan is recognised, though in the inverse way, by a centre tower over the end of the nave and a partial screen with turrets at the end of the aisles; at Wells the triple plan is plainly indicated in the front, although the two towers are spread out beyond the line of the aisles. We do not know exactly what Norwich was when the first design of the west front was complete (if it ever was)—probably something like Tewkesbury. At Worcester, Winchester, Gloucester, and Rochester, the nave and aisles are frankly shown at the west end, with neither towers nor screen. To say that the screen system was "almost invariably" employed is therefore a serious exaggeration; and in any case, it is a question whether, in an architectural sense, the system is so bad as it is here called. The section of nave and sloping aisle roofs is a weak line for the end of a building; it is much better to have its lines masked by a screen than by nothing else. And an even more important consideration in favour of the English cathedrals as compared with the French is the remarkable variety of the west fronts. The French west front is always the same in general conception; the English are all different. The glory of the great French portals we fully admit; but even here Peterborough, as an example of the "screen," goes beyond them.

In regard to the Renaissance the author is perhaps right in saying that it brought no new life to English architecture; the English Renaissance was a kind of echo of the Italian afar off. Mr. Sturgis attributes this partly to the Reformation and the consequent break with Roman connexion.

England produced a beautiful manner in the Jacobean mansions, and one quite her own; though it had features derived from the Italian Renaissance, it was not Italian Renaissance architecture, but English architecture making use of some Renaissance features. The name of the Elizabethan style, that peculiarly English chapter in architecture, is not even mentioned, though some of the buildings which belong to the style are named. However, Mr. Sturgis leaves us with a blessing; he seems to think he has been too hard on us, and concludes:—

"Notwithstanding shortcomings and faults, no country contains in itself a more precious architectural heritage than England; for, if it teaches no great lessons of art, it is yet instinct with all those qualities that have made England great; and every stone tells the history of a people who for all time have stood for freedom and justice, for honesty and uprightness.

Their houses speak of that home life which has been the underlying strength of its people, their churches tell of the struggle for truth, their municipal buildings tell of the dignity and freedom of the people who have built their great cities, and made England strong and powerful for good. Such a record is worthy to stand side by side with the greatest."

The article "Builder," by Mr. R. W. Gibson, lets us into some of the views held across the water on the subject of the contractor, and we have the contrast between the American and English type of builder explained. According to the Dictionary, the English contractor is usually more of a practical builder, the American more of an administrator and financier; but if this is regarded as the type of the American builder, it may be said that in this as in some other things besides building our institutions are becoming Americanised. The writer of the article laments (and we sympathise with him) the extinction of the old "days' work" system of payment for building, which he says "still prevails to a small extent" (hardly we think in England); but observes that "the admitted fact that days' work is always expensive is explanatory of its decadence." But is that the right way to put it? Is it more expensive in regard to the quality of the work done? The fact probably is that days' work is nearly always better done than contract work, and therefore is worth its money. As the author himself says immediately afterwards—"the impulse in days work is to render the best work possible. In contract it is to do the least that will be accepted." And that fact is at the bottom of a great deal of the difference, constantly remarked upon, between the massive and solid work of older buildings, even since the great days of architecture—the work in eighteenth-century mansions for example, and the comparative smallness and meanness of proportions and thicknesses in modern work. The owner wants the lowest tender, and the putter out of the lowest tender has to scamp the work to make it pay. The contract system is at the bottom of a good deal of "the decay of modern architecture." We get some further light on American ideas on this subject in the same contributor's article on "Bill of Quantities"; a subject which, by the way, should perhaps rather have been placed under letter Q, as "Quantities." American contractors usually each prepare their own quantities according to their own system; and thus, in the case of competition tendering, the same work is done many times over. The defence for

it is partly that each contractor understands his own system best, but more especially that the large contractors consider that hereby they keep out the smaller ones from interfering with them; under the system of a single set of prepared quantities "the builder of small attainments would dare, and would be enabled, to tender proposals for works which, under the present system, he is unable to approach." Attempts to introduce the "quantities" system have met with no success in America, and the author rather scoffs at the English bill of quantities as "minute and analytic to the verge of triviality," and seeming to aim at "complete presentation of the work without the aid of the drawings," which is just the fact, and hence the contractor sometimes dispenses with seeing either the drawings or the building itself of which he is nominally the builder. This is one of the evils inseparable from the quantities system carried to its full extent: it divorces the builder from the building.

We should have been interested to see an article on American architecture, but the subject has been divided into North and South America, United States, &c., and hence is relegated to future volumes. Canada is the subject of a short special article, "Byzantine Architecture" is well treated by Mr. A. D. F. Hamlin, and "Egyptian Architecture" by the same contributor. The subject of "Design" is treated in two sections, the first by the editor, the second by Mr. Lethaby. The former is an exceedingly practical and common-sense article, basing architectural design almost entirely on considerations of plan and convenience, a view which is somewhat too exclusively maintained. The other side of the question was however perhaps purposely left to Mr. Lethaby, who discusses the subject from the ideal or æsthetic side. His short essay is full of pregnant suggestions. "All design," he says, "is dealing with certain problems in the light of a body of observation and experience." There is a general agreement that the first condition is utility, and the construction must be governed by considerations of stability. "Beyond this, there is no agreement as to elements and no recognised basis of criticism, other than that of archaeological correctness—judgment by authority." This is certainly too sweeping a statement, and seems to be partially contradicted in the next sentence—"All criticism of art which is not a mere expression of 'taste' comes to this—it is either a statement of 'authority' or it examines a work 'according to reason.'" According to this latter sentence, then, "reason" is a basis of criticism; and here we are entirely with the author. A real architectural criticism depends upon a very subtle application of reasoning, in relation to circumstances, intent, and material. This surely promises some ground beyond "authority." The difficulty of criticism according to reason is that it is often exceedingly difficult to express in definite words what is often almost a matter of intuitive perception. Those who are acquainted with Mr. Lethaby's other writings or lectures on architecture will hardly need to be told that he is much disposed to reduce everything to a consideration of the handling of material. There is a great deal of truth in this; but it may be pressed too far. It is surely possible to have an abstract design on

paper which has not been influenced by considerations of material. No doubt, as soon as it comes to executing it in the solid, material influences and probably modifies it; but we are still of opinion that there is such a thing as abstract design, difficult as it may be to define in what it consists or should consist. For built design, however, Mr. Lethaby's summary may be considered pretty near the truth:—

"All consideration of architectural results leads us back to material determining conditions, and there are infinite possibilities open for natural growth to that architecture which shall once again examine the groundwork. When a serious general interest is taken in building for noble uses, we shall find in these considerations of materials, need, tradition, and nature, all that is required to build up a positive style of architecture."

The biographical articles are short, and appear to be studiously confined to the mere statement of facts. That dealing with Barry, for instance, has not a word either in regard to his special merits or to the character of his great and world-renowned building; it is simply a short and dry catalogue of buildings and dates. If the theory be consistently adopted that the function of a dictionary is only to give information and not opinions, this is right; but in that case Mr. Lethaby's paper on "Design," and some others, are out of place. There seems rather a tendency to the multiplication of smaller headings. Is "Bedroom," for instance, properly to be regarded as a technical expression requiring explanation in an architectural dictionary? or "Committee Room," which is defined as "a room specially provided for the meetings of a committee or committees"? This reminds one of the famous definition of "Archdeacon" as "a person who performs archidiaconal functions." Under the general heading "Column" are a number of rather trivial sub-headings, some of them rather arbitrary: "Midwall column," for instance, for a column a good deal narrower than the wall, and standing under the centre of its thickness; this is surely not an integral technical term in architecture. "Unbending column" seems still more questionable; it is defined as "a column of which the diameter is in such proportion to its height that, under vertical pressure, it cannot be fractured transversely by any tendency to lateral bending." We certainly never heard of "unbending column" as a special technical variety; and at all events, when it is stated that "the proportion of safety varies according to the material used," it would seem that to make the article of any use there ought to have been some statement of the proportions to ensure unbending stability in different materials, otherwise it was not worth while to introduce the heading at all. We are indeed told that a column of stone or marble "finds its idea of stability in the proportions of the Greek orders." As the proportions of height to thickness are different in various orders, this is an exceedingly unscientific statement, and the paragraph is altogether rather a foolish one.

Under the heading "Bell Cage" or what would be called in England "Bell Frame," only the old-fashioned wooden frames are illustrated, the recent use of steel frames built into the walls not being alluded to, and the information on this subject is altogether rather meagre; but it is

perhaps rather an English than an American subject. Under the head of "Carillon" mention should certainly have been made of the modern system of having the hammers kept in a raised position and merely *dropped* on to each bell, instead of their having to be raised and dropped for every blow, an improvement (due to an English firm of makers) which gets rid of the curious stammering effect of the old carillons.

Taken as a whole, however, the American "Dictionary of Architecture" is a remarkable work, and great pains have been taken to make it complete; but in spite of it being in our common language and, as we have observed, much more cosmopolitan than any French or German dictionary, one may perhaps still think that an English editor and contributors are required to produce a dictionary of architecture which would completely satisfy English requirements.

THE NEW GALLERY.



THE fear the New Gallery must be judged to have fallen from its high estate. The death of Burne-Jones was a great loss to its annual exhibitions, where his works were the chief attractions; and not only is there no one to make up for him, but some of the best of the other usual contributors have either dropped off or have sent much less important works than formerly. In fact, this year the New Gallery can only rank as an exhibition of the secondary order.

Mr. Watts is faithful to the gallery, and though he hardly paints as he once did, his "Greed and Labour" (127) affords a fine contrast in physique and expression between the stalwart labourer in the foreground, carrying his tools as if he were proud of them, and the mean cunning figure of "Greed" behind; the picture is not without pictorial effect, though, like many others of Mr. Watts's later works, it is far too obviously painted for moral rather than artistic motifs. Mr. Watts, in his later years, has appeared to regard the art of painting more and more as a means of giving moral lessons. To moral lessons we have no objection—in their proper place and delivered through their proper medium; but they are not the business of art, and the idea that they are has led Mr. Watts already into pitfalls which he has more or less escaped in the present picture. Nevertheless, we look with more sympathy on his pretty little work, "Trifles Light as Air" (124), a kind of chain or garland of fluttering children, which in its spirit, though not in its texture, recalls Correggio. This is pure art, and a pretty and delicate fancy.

Beyond these, there are few figure pictures which are of much importance. Mr. Walter Crane's "Fountain of Youth" (67) and Mrs. de Morgan's "Attainment" (23) both represent the kind of revival of the moral picture of the early Renaissance which is an object with some artists at present; and neither interest us much, except in respect of the fact that the first named work, as well as some other smaller pictures in the Gallery, is painted in tempera. We have revivals of every method in art now; we had the revival of etching, and more recently the revival of lithography; and for the next few years probably

we shall see a number of pictures in tempera. It is a medium which has its own beauties; it keeps a dead surface, and it is especially suitable to that school of flat painting which is the proper walk of decorative art. But it can never have the richness and depth of oil painting. In painting this revival of tempera seems rather analogous with the revival in music of the harpsichord and clavier in opposition to the pianoforte; the latter is far the finer instrument, but we have got used to it, whereas the old instruments are for the time a novelty. It is the same with tempera—an inferior medium to oil, but for the present a novelty.

Among other pictures in which the figure dominates is Mr. Von Glehn's "L'Enchantment de la Forêt" (182), called "a design for an architectural feature." We presume this means for a decorative picture; it is a scene in a forest, with a number of nude nymphs not very carefully executed, but the whole has a decorative effect. Mr. George Henry's "Gold Fish" (176), a study of a woman seated nearly with her back to the spectator and looking at a globe of gold fish, is a work of real character; and Mr. Melton Fisher's "Dreams" (193), which may be taken to be practically a portrait, is one of real beauty. Mr. Boughton shows the same young woman who appeared last year at the Academy by "The Waters of Forgetfulness," this time as "A Diana of the Goose Pastures" (204), a pretty nude preparing to bathe in the brook; far superior in colour and artistic sentiment to Lady Stanley's well-drawn but hardly-painted "Bathers" (111). Mr. Austen Brown's "Sunshine and Shadow" (246) can only be called a sketch on a large scale; as a small sketch it would be an effective study, but for this large scale it is far too rough and crude; the mass of shadow over a great part of it seems like wasted canvas.

Among portraits there is an admirable bust of a man by M. Benjamin-Constant (102), fine both in character and colour, and a good straightforward likeness of Mr. Kipling (36) by Mr. John Collier. Mr. Greiffenhagen's portrait of a lady (16) is characteristic in colour and treatment, as might have been expected, but the face is perhaps the least satisfactory portion of the work.

The landscapes in the exhibition, though none of them are of the first importance, include several works which are interesting from their individuality of style and sentiment. Mr. Wetherbee's "Pool of Diana" (147) suggests the idea of a landscape by Leighton, with the figure of the huntress goddess at the margin of the pool added by another hand. Diana is a good deal in evidence in the gallery. Mr. Byam Shaw has also his conception of her (129) following her dogs and clearing a hedge with a most athletic bound—a picture which looks rather like a joke. Mr. Coutts Michie's "Autumn Clouds" (161) is a fine scene over a flat country with rolling masses of cloud above it; somewhat in the same spirit is Mr. Hetherington's picture of a rain-storm coming over a moor; a work the more effective from its reserve of treatment. It is somewhat disappointing to find Mr. Adrian Stokes only represented by a small city picture, "Twilight in Trafalgar Square" (177), very good in its way however. Mr. Frank Brangwyn, like some other painters,

seems to have a kind of spite against old Kew bridge; we have seen it in several landscapes lately, always badly and inadequately treated in regard to its architectural character—this example being perhaps the worst.

Among the miscellaneous articles in the Central Hall is a head of a woman in white metal, by Mr. Taubinan (460), finely modelled and full of character; a very pretty silver and enamel jewel casket by Mr. Alexander Fisher, and two charming silver cups by the Countess Gleichen, one of them (No 462) showing a marked originality of design. There are also two small cases of jewellery, by Mr. Nelson Dawson and Mr. and Mrs. Gaskin. There is no sculpture work of any importance.

NOTES.

PROFESSOR J. J. THOMSON, the Cavendish Professor of Experimental Physics at Cambridge, gave a most interesting lecture on "The Existence of Bodies Smaller than Atoms" at the Royal Institution last week. Many years ago it was noticed that if a coin or a sheet of printed matter was shut up close to a sheet of white paper a faint "ghost-like" image was sometimes produced on the paper. These images were proved by Becquerel, in a series of brilliant researches made a few years ago, to be formed by rays which he found were being given off continually by compounds of uranium, printing ink, and many other substances. Professor Thomson, in order to explain the observed phenomena, was forced to make the supposition that the Becquerel rays were not waves in the ether like light waves or the waves used in wireless telegraphy, but were actual streams of matter thrown off from the surface of the bodies which emit them. Unlike Newton, who made the hypothesis of the corpuscular theory of light and then tried to explain all the laws of optics by means of it, Professor Thomson expressed mathematically the laws of Becquerel and kathode rays, and then saw from his equations that the rays possess momentum, and, therefore, must have mass. When he first enunciated his theory to the scientific world three or four years ago it was received with incredulity, but it has now been adopted by many of the foremost scientists. He regards the chemical atom as made up of a large number of similar bodies which he calls corpuscles. The normal atom forms a system which is electrically neutral. The electrification of a gas consists in the breaking off from the atoms of a few corpuscles. The remainder of the atom is positively electrified, and the more corpuscles broken off the stronger is the attraction that bind the remainder to the atom. Professor Thomson has calculated from the results of experiments on very different substances that the mass of a negative corpuscle is about the five-hundredth part of the hydrogen atom. It seems to us highly improbable that his theory can have no solid foundation in fact, for if it had not we should be forced to explain his results as simply marvellous coincidences. Yet if it is true, the theory of chemistry will be revolutionised, and the old dream of transmuting the baser metals into gold may again absorb the attention of inventors.

MAY-DAY will witness the inauguration of a reform in railway procedure which has long been wanted. The haphazard way in which we are content to abandon our luggage when travelling has always been a source of amazement to foreigners, many of whom are accustomed to having their property protected by a system of baggage registration. Not only are they astonished at our heedlessness and recklessness, but they have succeeded in making it understood that they strongly object to being made the victims of our luggage system—or want of system. The Great Eastern Railway Company, who seem to have quite superseded the Midland as pioneers of railway reform, announce the introduction of the check system next month between their Liverpool-street terminus and seaside stations. It is to be hoped that this will prove the thin end of the wedge, and that it may result in a general adoption of some such system on all lines. The Great Eastern are not the only sufferers from the depredations of luggage thieves, and the nuisance is not only a general, but a growing one. The railway companies have constantly been pressed to move in the matter, and it is difficult to see what objection can be urged against an optional system of registration such as the Great Eastern Company are about to adopt.

The Tank Failure at West Ham.

It would be premature at the present moment to attempt to decide whether the regrettable disaster at the West Ham Workhouse resulted from want of attention, or from some defect practically impossible of detection. Yet the subject is worthy the consideration of architects, and especially of those engaged in the design of public institutions. In some instances it may be convenient to distribute storage tanks over the different blocks constituting a workhouse or hospital, and under such conditions galvanised steel tanks can be employed which, humanly speaking, provide an absolute safeguard for the occupants of structures beneath. But in most large buildings or groups of large buildings there are reasons why a central reservoir should be established. To construct a wrought-iron or steel tank of sufficient size would be very costly, and cast iron is naturally accepted as the most suitable material of construction. Owing to the nature of the material and the weight of the units employed, the completed tank cannot be regarded as a satisfactory structure, for it is little more than an assemblage of plates somewhat insecurely bolted and tied together. Any individual plate might collapse by reason of imperfection; the joints are made between flanges of more or less brittle metal, and their maximum strength is determined by the resistance to variable strain of bolts which are exposed to considerable corrosive influences. Unless aided by internal stays, the tank cannot be trusted to contain the weight of water required to be stored. As a general rule, internal stays take the form of long horizontal bolts, and it is no easy matter to adjust these so that equal strain may fall upon the joints of the different plates composing the tank. There are, therefore, several sources of weakness and as many sources of possible danger. The chief care of the architect or engineer should be to reduce lateral

pressure as much as possible by adopting a shallow rather than a deep form of tank, and to avoid the use of long horizontal tension ties, which may become direct sources of danger by permitting excessive strain upon one or more joints. His influence should be brought to bear upon proprietors so that large storage tanks may be erected in places where inmates can be in no danger in case of accident, and it is also desirable that he should urge the necessity of adopting such dimensions for water towers as will permit the design of cast iron tanks to be in accordance with recognised mechanical principles.

MR. F. C. COLEMAN, of Darlington, writes:—"During the course of the last few weeks

The First Railway Bridge. the first metal railway bridge, one crossing the River Gaundless, a tributary of the Wear, at St. Helens, about seven miles west of Darlington, has been replaced. This interesting structure was built in 1823 for the Stockton and Darlington Railway, and has been in position ever since at the western extremity of their original line. It was composed of cast-iron, and it is believed to be the only one of its kind.* A Mr. Storey is generally credited with its erection, presumably to the plans of George Stephenson, the then engineer of the Stockton and Darlington Railway. At this period civil engineering was scarcely recognised as a distinct profession, and the bridges erected prior to 1825 were the work of either architects or millwrights. The first railway bridge at Darlington was the work of a Durham architect—Bonomi" [This was the son of the celebrated Bonomi] "and it is said that the first railway 'skew' bridge—one crossing the River Tees at Croft Spa—was the work of a millwright. In consequence of the heavy locomotives now in vogue on the North-Eastern Railway, the bridge at St. Helens has been replaced by a more massive structure and removed to Darlington, where it has been suggested that it should occupy a position upon a pedestal alongside Stephenson's other relics, the No. 1 Engine and the Derwent."

JOHN KIP's fine large-scale print, entitled "Vue à Perspective de la Ville de Londres

Westminster et Parc St. Jacques" (1710, first edition), shows the prospect as seen by one looking westwards from a height in front of Buckingham—or, more correctly, Buckinghamshire—House. The foreground depicts upon an unusually extended scale the aspect, 200 years ago, of the site which has been chosen for the National Memorial to Queen Victoria. We there see the three avenues of which the middle one, bordered with a raised kerb or edging, was used for the game as well as by "the quality" for their fashionable morning's walk. A passage in a scarce pamphlet, "A Trip from St. James's to the Royal Exchange," 1744, indicates that separate walks were assigned to "valets de chambre" and to "ladies' women." To the south is the straight canal or "river," 17 yards wide, which extended about 600 yards between four lines, two on each side, of lime trees planted in 1660, as far as the Tilt-yard of Whitehall Palace—the present Parade—ending at a point opposite

* The only railway bridge, we presume the writer means.—Ed.





G.W. COLLINS.

WHITES ABBEY



A PICTURESQUE COURTYARD
WHITBY.

G.W. COLLINS.



STREET SCENE
WHITBY.



THE BRIDGE, WHITBY,
G W COLLINS.



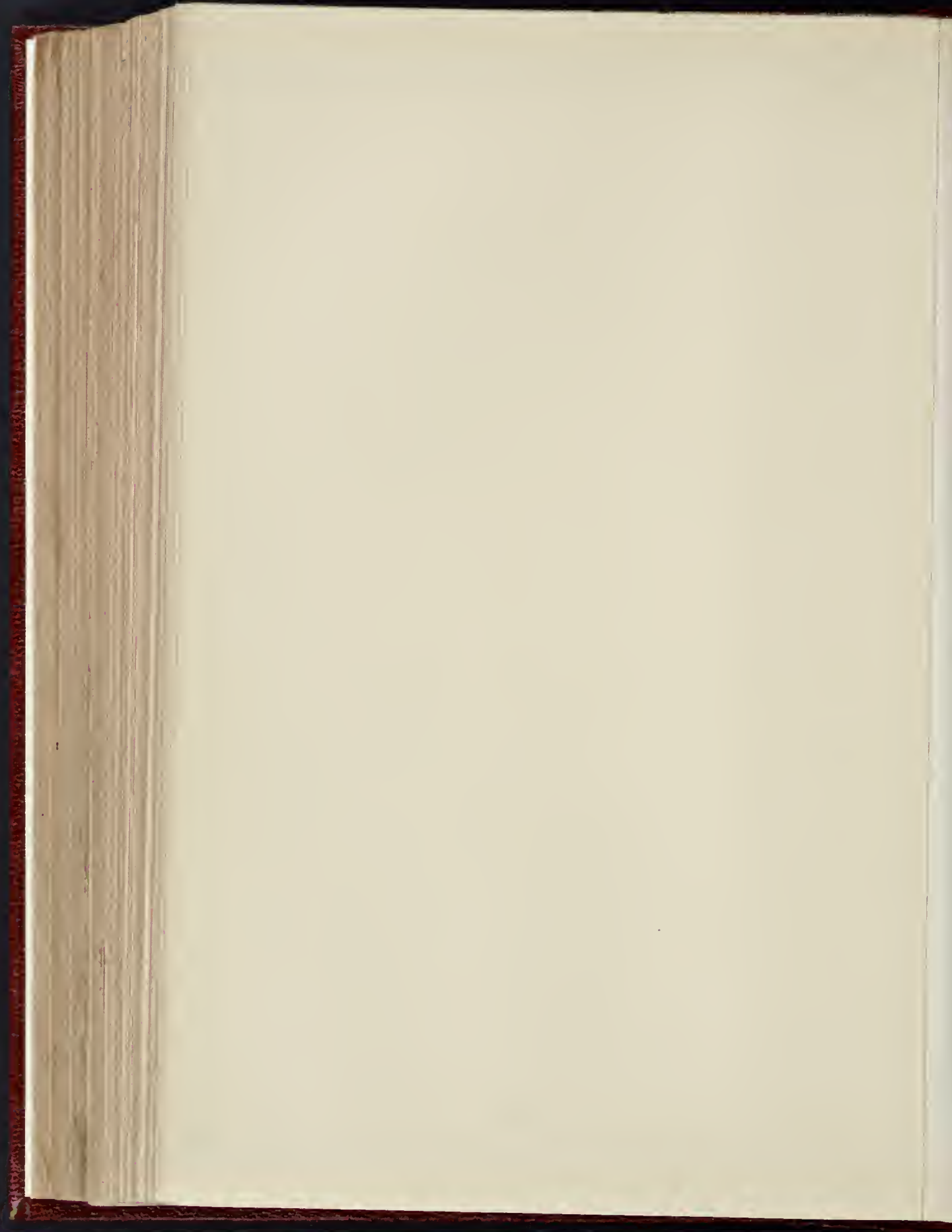
G W COLLINS.



OLD HOUSES
WHITBY HARBOUR.

G W COLLINS.

INK PHOTO SPRAGUE & C. L. 4 & 5 EAST HARDING STREET FETTER LANE E.C.



the Cockpit (Treasury Chambers). The long canal, together with its cuts and canals, constituted the Decoy, in Duck Island, which Le Nôtre and Dr. Morison laid out for Charles II., who appointed St. Evremont its governor. The ground had previously been diversified with many ponds fed by the Tyburn, of which the largest, Rosamund's pond, at the north-west corner, remained until 1770, and formed the scene of a painting by Hogarth. Henry VIII. built a wall around the pleasure of his Palace of St. James's; Aggas's map delineates a part of the original park, with its wall, and with stags in the enclosure. The Calendar of State Papers, *passim*, records an order of January 1, 1650, for the issue of a warrant "to the keeper of Marylebone Regent's Park to cause one hundred best deer to be transferred to St. James's Park—Colonel Pride to take care of this business." Deer and cattle in plenty appear in the views by Kip, Maurer, Canale, and others of the Mall and the Park. The "Milk Fair" has survived to our own day at the old Spring Garden, though in the autumn, 1885, peremptory steps were taken for the removal of the cow-stalls, only two being suffered to remain. The Park as we now know it was laid out and drained in 1828 by John Nash, whose Marble Arch was first erected in 1825-7 at the west end of the Mall. There is a good view by Higham showing the Mall, the Marble Arch, and Nash's original north-east front of Buckingham Palace before the alterations carried out by E. Blore in 1847, and the erection, after Sir James Pennethorne's designs, of the State ballroom, supper-room, and galleries. The bridge across the ornamental water was built in 1857.

THE items under this heading

in vol. v., p. 570, of the "New English Dictionary" should prove to be of interest to most of our readers. Dr. Murray states that the origin of the term is not ascertained; he declares, however, that the assertion made in a letter to the newspapers in January, 1884, that the words "jerry builder" and "jerry built" commemorate the name of a firm of builders and contractors, Jerry Brothers, of Liverpool, in the earlier years of the last century, has upon investigation not been confirmed. Jerry—which is really an adverb—is a vulgar variant or corruption of the proper name Jeremy or Jeremiah. In nearly all the compounded words in which it occurs it has a depreciatory signification. The earliest examples cited in the Dictionary of the use of "jerry" as an adverb qualifying "built" and "builders" consist of quotations from the Lonsdale "Glossary," 1869, "jerry-built, slightly or unsubstantially built;" Ruskin, "Fors Clavigera," v. 263 (1875), "rows of jerry built cottages are creeping up;" and Young's "Every Man His Own Mechanic," 1881, "jerry builders."

CHURCH, NORRIS BANK, NEAR STOCKPORT.—The new parish church of St. Martin, Norris Bank, near Stockport, was consecrated on the 18th inst. by the Lord Bishop of Manchester. The church consists at present of large chancel, chapel, organ chamber, vestries, and three bays of the nave, and aisle, leaving three bays to be erected at some future time. The present accommodation is for 420, but it is estimated that eventually there will be sittings for 700. The cost of the building, which is built of local bricks, with terra-cotta dressings, is put down at £1. a sitting. The pulpit is of carved oak. The architect was Mr. R. B. Preston. The roofs are open timbered and boarded.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, W., Mr. W. H. Seth-Smith, President, in the chair.

The minutes having been read and confirmed, a vote of thanks was accorded to the donors to the library of the following books, *i.e.*, "Principles of Planning" by Mr. P. L. Marks, and "Building Specifications," by Mr. John Leaning.

On the motion of Mr. G. B. Carvill, hon. secretary, a vote of thanks was passed to Mr. Andrew Oliver for a donation of some lantern slides of Hatfield House and Church.

Mr. H. le C. Browning having been elected a member, Mr. Carvill read the names of those gentlemen who have been nominated as officers for the ensuing session.*

The following gentlemen were then appointed to act as scrutineers in connexion with the election of officers, *viz.*, Messrs. W. A. Jekells, H. G. Collins, C. W. Beaumont, and A. A. Carder.

The Memorial to the late Queen.

The Chairman said that the Committee had had before them that evening the question whether any representation should be made to the Royal Institute of British Architects as to the selection of the five architects by the Executive Committee for the memorial to the late Queen Victoria, and they had come to the conclusion that the Council of the Institute was not in a position to say what course the President should take or had taken on that Committee. Mr. Emerson was only one of that Committee, and very likely he had used the utmost of his influence to widen the competition, and, at any rate, five architects had been selected as against one sculptor. The Committee felt it would be unwise to make any strong representations, therefore, especially as a general meeting of the Institute would be probably held to discuss the whole question; but they had decided to send a letter in general terms to the Institute Council expressing the desire of the Association that the competition should be a wider one. He (the Chairman) would like to know if the meeting approved of the action that had been taken.

By-Laws.

The members having indicated approval, the Chairman gave notice that a special general meeting would be held on May 10 at 7 p.m. to consider suggested new by-laws limiting the terms of office of hon. treasurer, hon. librarian, and hon. secretaries to five, two, and four years respectively, and authorising the appointment of four trustees in whose names the funds of the Association shall be invested.

The Eighteenth-Century Architecture of Bath.

Mr. M. A. Green then read the following paper on "The Eighteenth-Century Architecture of Bath" :—

In this paper we are mainly concerned with the period between the years 1727, when the elder Wood came to Bath, and 1781, the date of the death of his son. But it is necessary to review the work which preceded and which followed theirs, and therefore we will take a survey of the principal buildings erected from the very beginning of the eighteenth century to its close, including the names of those who were sometimes competitors with, sometimes followers of, these two men.

But to go back still farther in time for a few moments. In his "History of Bath" Wood shows a map which, he says, is "a copy of Dr. Jones's view of the city of Bath as it was published in the year 1572," really of a Dr. Johnson's. Here the city can be seen in delightful simplicity, surrounded by its walls, of which we have now few traces except in name, a piece in the Upper Borough Walls and the Eastgate, with a portion till lately adjoining, being the only relics above ground, unless there are remains built into any of the houses. The size of the city at this time was about 1,200 ft. from east to west and 1,150 ft. from north to south.

By 1590 the city was much enlarged, and by a charter granted by Queen Elizabeth extended from the bridge over the Avon at the bottom of Southgate-street along the middle of the river as far as the meadow called Kingsmead, and thence to the highway leading from Weston to

Walcot, and so to the Win Yards, or Vine Yards, thence by Walcot Churchyard, and so along the middle of the river back to the old bridge.

A word here as to the Bath waters. Wood says:—

"About the latter end of September in the year 1663, the King (*i.e.*, Charles II.) brought his Royal Consort, Queen Catherine, to Bath; Sir Alexander Frayser, as chief physician, attending them hither, who, upon finding the hot waters to be from the same minerals as those of Bourbon, and that they could be pumped up directly from the spring, began to advise the inward use of them, sending all such patients to the hot fountains of Bath as he had before ordered to those of Bourbon, whereby the fatigue and expense of a long journey from the Britannic Island to the heart of France, as well as the danger of crossing the sea, was avoided, to the private advantage of the subjects of Great Britain and to the public advantage of the kingdom.

"From this period the drinking of the hot waters of Bath may be very justly said to have been established, and from the same period the trade of the city began to turn from the woollen manufacture to that of entertaining the strangers that came to it for the use of the hot waters."

In 1702 and 1703 Queen Anne and her Royal Consort, the Prince of Denmark, came to Bath, and thereupon so many people of rank and fortune came also that the villages around were filled with them, and many had to pay a guinea a night for their beds. In the following year Dr. Oliver began to write on the Bath waters (he was by no means the first to do so), and in consequence the Corporation improved their surroundings somewhat, but they still fell short of the Doctor's wishes, and in 1707 he published a practical dissertation, at the same time recommending the making of a cold bath for the use of the public. Says Wood:—"Mr. Thomas Greenway, one of the Freestone Masons of the city, directly engaged upon the work and made a handsome bath in one of the rooms of a house built by him upon the beach at the foot of Beaching Cliff. The bath was supplied by a spring of water which issued out of the ground at a place where the rays of the sun could never reach fill after surmounting the equinox." Beaching Cliff is one of Wood's misnomers; it is really Beechen Cliff, from the beeches planted upon it.

About this time Parliament was applied to for power to amend the principal roads leading to Bath, to pave, cleanse, and light the streets, lanes, &c., of the town, and to regulate and license a sufficient number of chairmen, that nothing might be wanting for the public utility of the city.

"Twenty years," says Wood, "had now been spent in improving the private buildings of the city; in the course of which improvements, thatch'd coverings were exchanged to such as were tiled; low and obscure lights were turned into elegant sash windows, as soon as Mr. Taylor (who was by the way a Chairman) had set the example; the houses were raised to five and more stories in height; and everyone was lavish in Ornaments to adorn the outsides of them, even to profuseness." But with all this splendour little attention was paid to the wants of the company that assembled at Bath until Harrison's rooms were built in 1708. In spite of a reaction on the part of the citizens because of the increase in the numbers of the houses, Mr. George Trim, a member of the Corporation, and whose mother was a near relative of Inigo Jones, began in 1707 to build the street named after him at the north-west corner of the city. It was in a house in Trim-street that General Wolfe lived, who was in Bath when he received intimation that he was to command the expedition to Quebec. Note the group of warlike emblems in the tympanum over the door.

On the other side and farther down the street are some houses built in 1727 and restored in 1807.

Trim Bridge, or St. John's Gate, is the connecting through between the Upper Borough Walls and Quiet-street.

The houses about this period are characterised by the large windows with projecting wave mouldings round them. Of such is the Saracen's Head in Broad-street, with initials W. D. and date 1713 upon it. It was here that Dickens used to stay.

The oldest house in this street is No. 38, date 1709, and almost identical with it in elevation is one in Chapel-court. I think these are by far

* See our issue for April 6 for these nominations.

the best of the older houses in the city, and their dignity is probably due to the very large window spaces and the number of openings. Whatever may be the cause of it, there is undeniably good proportion shown in them. In the St. Catharine's valley there are entrance doors of the same type, with unusually wide and massive bolection mouldings.

In 1716, on the site of the new bowling green, a row of houses was begun, and was called Green-street. It is one of the most picturesque parts of Bath now remaining. The detail at times shows a free Classic treatment, and there seems to have been a distaste for bare wall space which has led to a full enrichment of these small facades. The sashes are also divided into small panes, with wide glazing bars.

There remains in Westgate-street an inn called the Bunch of Grapes, which has a fine plaster ceiling dating about 1680-1700, but the front facing the street was rebuilt, together with other houses in the neighbourhood, about twenty years later—i.e., just before Wood began his work. In the adjoining house the Orders are used—the Ionic and Corinthian remaining on the first and second floors, the Doric having been most likely used on the ground floor.

Meanwhile, another citizen had been building in the south-east corner of the city.

In a house in St. James-street South small panes of glass still remain in the lower windows; these make at once a feature in the design, whereas in the upper lights, where plate glass has been substituted, the windows seem to lose their identity with the building.

Hard by is Weymouth House, which was built in 1720 for a Dr. Bellinson, and was designed by William Killigrew. Weymouth House was the residence of the Thynne family, whose descendant, the Marquis of Bath, is still its owner.

An almost exact copy of Weymouth House is to be found in No. 3, St. James-street, but the consoles which support the pediment over the door are here carved into griffins, which were never executed in the former.

Nearly opposite to Weymouth House is a curiously rusticated building, which was once Crutwell's Bath Chronicle office. The Orders are used, as seen frequently, to make a central feature, but the treatment is not good. A writer in 1870 says—"This newspaper, which was always considered one of the most elegant printed provincial journals in the kingdom, Mr. Crutwell, in commemoration of her late Majesty's visit to Bath, had a new type cast expressly on purpose, and everything to correspond, so as to produce a *chef d'œuvre* in newspaper printing, and who had the honour of presenting it to her Majesty, who most graciously received the same, and expressed her approbation, not only upon this compliment offered to her on her visit to Bath, but of the great improvement made in this Department of literature."

Near here in Abbey Gate-street are two shell heads serving as pents for the doors.

The best rain-water head which I have seen in Bath came from the houses pulled down a few years since on the south side of Orange-grove, and has a date 1703 or 1709 scratched upon it faintly.

We must here notice old Widcombe Manor, built for Mr. Philip Bennett's son in 1727. The builder was likely to have been the Thomas Greenway who put up Beau Nash's house in St. John's-court, now the theatre. The great feature of this house is the treatment of the order which embraces two stories, and which appears rather large, seeing that it is almost impossible to view it from a distance. The canted bay on the south side, with the projecting balcony, was an addition in the middle of the nineteenth century. Note how the base moulding of the pilasters ramps down as it leaves the house and becomes the coping of the balustrade in the garden. The interior shows a hall with a flat arch thrown right across it, and a wide staircase with moulded and twisted balusters rising in groups of threes and set close together. At the top of the stairs all the pilasters and arches are carried out in wood. This gives a somewhat wiry appearance to what would otherwise be a good architectural feature.

The garden house here is a refined piece of work. The ground story facing the garden has three arches, which were originally open to the ground. Between the arches are engaged Doric columns, and the upper part has merely an Ionic column at each end of the

wall and is severely simple; nevertheless, the firmness of the mouldings more than atones for any want of ornament.

From a comparison of this building with the Palladian Bridge in Prior Park I am disposed to think they are both by the same hand, and that if the Palladian Bridge was designed by Wood, then this little house was also.

Inside there are three recesses for seats, and the whole except the ceiling is built in stone.

The dovecot, also entirely of stone, lies near the stables, and is a most interesting feature.

The building called the Garrick's Head, and now known as the Theatre, was at one time the residence of Richard Nash, M.C. of Bath. Nash had a chequered career. Born in Swansea in 1674, he went to Oxford at the age of sixteen, and, having tried the law and the army in turn, finally entered the Temple. In 1703, however, he came to Bath, and on the death of Captain Webster he was appointed M.C.

This house, situated in what was known then as St. John's-court, was built in 1720 by the Thomas Greenway above mentioned and after whom Greenway-lane is named. The treatment of the windows of the second floor in connection with the cornice is very unconventional. The dies at the angles are now the only parts remaining to show the existence of a former balustrade. On the right will be seen the doorway of Beau Nash's house.

After Nash's power had declined he removed to another house just north of the last, the chief feature of which is its elaborately ornamented doorway, and here he died in 1761, aged eighty-seven.

On the other side of the theatre are Beaufort Buildings, which Wood says are the piratical architecture of a Mr. John Strahan, a friend of Mr. Hobbs, a timber merchant, of Bristol, whom we mention below.

Londonderry House and Kingsmead-square were also built by John Strahan.

In 1723 another Act was obtained for Bath relative to lighting, cleansing, and other things, and to make the former Act more effectual; and "in 1724," says Wood, "a subscription was opened by Mr. John Hobbs, a deal merchant of Bristol, for carrying the navigation of the river into execution, so that when I found the work was likely to go on, I began to turn my thoughts towards the improvement of the city by building; and for this purpose I procured a plan of the town, which was sent me into Yorkshire in the summer of the year 1725, where I, at my leisure hours, formed one design for the ground at the north-west corner of the city, and another for the land on the north-east side of the town and river."

It is proper to mention here that little is known of John Wood's early life. He was born in 1704, and it is probable that he was introduced to Bath through the influence of Ralph Allen, who may have met him while in Yorkshire, for it is there, as we have seen, that a plan of the city was sent to him. He was thus at this time but one and twenty years of age.

"After my return to London," he continues, "I imparted my first design to Mr. Gay, an eminent surgeon, in Hatton-garden, and proprietor of the land; and our first conference was upon the last day of December, 1725. On March 31 following I communicated my second design to the Earl of Essex, to whom the land on which it was proposed to be executed then belonged; and in each design I proposed to make a grand place of assembly to be called the Royal Forum of Bath; another place, no less magnificent, for the exhibition of sports, to be called the Grand Circus; and a third place, of equal state with either of the former, for the practice of medicinal exercises, to be called the Imperial Gymnasium of the City." In May, 1726, during the consideration of the drawings, a great fire broke out in Horse (or South-gate) street, and the larger houses that took their place were the last built before 1727.

In November of 1726 Wood fixed his preliminary articles with Mr. Gay, who then empowered him to engage with anybody that he could bring into the scheme for the building of a street 1,025 ft. long north to south, by 50 ft. east to west, for a way to the grand part of the design. This was Berton-street, but at first it did not go forward, and Wood having two other schemes on hand, and finding it necessary to have good workmen, determined to become his own contractor. The first scheme was the building of a court of houses for his Grace James, Duke of Chandos, and the second

was a canal between Bath and Bristol. For the canal he obtained men that had been on the Chelsea Waterworks; and he says "that until that time the real use of the spade was unknown in and about the city." "I likewise," he says, "provided masons in Yorkshire, carpenters, joiners, and plasterers in London and other places, and from time to time sent such as were necessary down to Bath to carry on the building that I had undertaken; and it was then, and not till then, that the lever, the pulley, and the windlass were introduced among the artificers in the upper part of Somersetshire, before which time the masons made use of no other method to hoist up their heavy stones than that of dragging them up with small ropes against the sides of a ladder."

At that time he was asked to prepare plans for dwelling-houses, an assembly house, and a general hospital, and in 1727 he left London altogether, and followed his workmen to Bath.

In 1727 Chapel-court was begun. The house to the left is that in which Horace Walpole lived in 1765, and the wing to the right St. John's Hospital or the Blue Arms, designed by Wood in 1728.

In the former is a characteristic fireplace of the period, with fine castings on the grate.

The death of the King (George I.), however, causing Mr. Gay to fall from his bargain, and the Corporation making light of Wood's schemes, the latter dropped his agency, became absolutely his own master, and took ground from Mr. Gay for the building of Queen-square, so named in honour of Queen Caroline. John-street took the place of Barton-street, and Barton-street was what is now the east side of Queen-square and part of Gay-street, as well as the portion to the south.

At this time (1728) he was building an addition to the north side of R. Allen's town house in Lilliput-alley, putting also a new front to and raising the old building a story higher. There was thus a basement story and, as in Queen-square and later on by his son in the Crescent, an order rising through the two stories over with one crowning cornice, and he says that it was "a sample of the greatest magnificence that was ever proposed" by him for the city houses.

The house now presents only two sides, north and south, and even so the south wing has been entirely severed from the main building. Inside there appears to be nothing of note remaining. It was here that Allen kept his clerks, who were engaged in the business of the cross posts. After Allen's death, in 1764, the house was neglected, although retained for some twenty years afterwards for postal business.

In 1730 the houses of the Duke of Chandos, called Chandos-court, were being erected. They were to form three sides of a square with a garden in the middle. The strictly symmetrical elevation is a good feature in this design, which is crowned with a fine pillowed frieze and cornice.

Chandos House had been rebuilt in 1727 for the Duke.

The staircase leads to the large hall over. Queen-square was in reality Wood's chief delight. The first side built was that on the east, which was begun in 1728. The whole was finished in seven years' time, including the chapel and many houses adjacent. The ground was originally intended to be level from top to bottom, but to save expense was afterwards allowed to slope southwards. The centre was to have a low enclosing wall bearing a balustrade, inside this a border of flowers, and then a basin of 45 ft. diameter supplied with water from a spring close by, but which was soon intercepted by some one who "penetrated the ground for vaults in the very line of it." Espaliers of elm and lime trees enclosed the four quarters, and within were flowering shrubs. The diagonal walks were covered with turf and the other walks with gravel. The basin in the middle had an obelisk 70 ft. high rising out of it, and on a dark marble stone on the south side of the obelisk and level with a man's eye was the inscription, "In memory of Honours conferred, and in Gratitude of Benefits bestowed on this City by His Royal Highness, Frederick, Prince of Wales, and His Royal Consort, in the year 1738. This obelisk is erected by Richard Nash, Esq." Wood confesses that this square, when planted, somewhat obstructed the view from the opposite sides of the houses, but he adds that the intention of a square is for people to assemble together, and that it should be separated from the ground about it.

The width of the square from house to house is about 315 ft.

You may know his thought in making the grand façade, as we may call it on the north of the square, it was to be as if it were a palace, and the east and west sides the wings. The vases on the pediment have disappeared. The original intention is shown in the plate from his own book. The design as usual with him was a simple one—a rusticated basement with the Corinthian order over and a large crowning cornice just as in Ralph Allen's house and yet from its treatment so different in effect as was fitting to a widely extended façade such as this. The windows have alternately triangular and circular pediments, as in a similar story in the Farnese Palace at Rome, and it will be observed that the masonry of the lower story has a vigorous effect on account of the boldness of its rustication; at the same time there are refined and beautiful impost mouldings at the level of the door and window heads. A bronze tablet has been lately put up on the centre house to mark the residence of the elder Wood. It was here that he died on May 23, 1754, and here also his widow deceased some twelve years later.

The house on the extreme right has furnished me with two details, the first being that of a staircase where we may note that, as in Widcombe House, the balusters are arranged in rising groups of three to each step; and the other a ceiling on one of the upper floors in plaster. There was no shirking of finish in the case of John Wood's builders though the work was often of a speculative nature.

The east wing was completed with little alteration from the original design, but the west had to be altered in order to get the building taken up and it was divided into three main blocks, the centre one being treated with the Ionic order, and having a decidedly Greek feeling about it.

At the south-west angle of Queen-square stood the Chapel of St. Mary, of which the token here shown gives a good general idea, seen more in detail on an old photograph which was kindly lent me. Ionic capitals from the interior yet remain on the site of the chapel. Dr. Hunt had tried to get St. Michael's Church rebuilt instead of having another chapel, but as the parishioners of St. Michael's rejected all such proposals, Dr. Hunt gave up his point and promised to support Wood in his new design. Immediately the proposal was made to build this chapel, Wood had applications for ground for no less than seventeen houses. He approached Mr. Gay, the patron of the Rectory of Walcot, for the purpose of procuring a lease of the land required, and on March 25, 1732, at Mr. Gay's request, he laid the first stone and the work was pushed forward and completed at the end of 1734. The inside was of the Ionic order—67 ft. long, 48 ft. broad and 36 ft. high, the outside of the Doric order, and the whole structure, with its furniture, cost about 2,000l.

In 1729 Wood built a villa called Eagle House at Bathaston, where he lived for some time. The house has been much altered, but a fine original doorway now remains, which has been applied to the south side of the house. The head on the keystone is that of Queen Caroline, wife of George II. An eagle carved in stone surmounts the frontage to the road. The younger Wood died here in 1781.

While mentioning the works of Wood outside the city, it will be well to include two or three more houses which he built at various times.

The little house called Lilliput Castle was built, as the legend on the engraving says, by Mr. Jerry Pierce, in the year 1738, against the north end of Mons. Badonca, that is, Lansdown, and formed the nucleus of what is now known as Battlefields, standing about a quarter of a mile below the monument. From its form the wits of Bath called it T. Totum. The whole structure was but 120 ft. square. Much to the regret of our architect it suffered from two fires, and was afterwards altered.

At the south end of the Kingsdown at Bradford-on-Avon, stands Belcombe Brook Villa, built in 1734 for Mr. Francis Yerbury. The situation is extremely pleasant, the grounds sloping down to the river Avon, and it was here that Wood showed himself to be a master of landscape gardening. To the right of the courtyard is a stone-built dovecot and the paving in the courtyard is as originally laid. From each angle of the house a balustrade runs

diagonally into the garden, following the slope of the grounds.

The elevation is finished with a pediment supported by four Ionic pilasters, the lower windows being well treated with triangular pediments and close balconies, and the upper ones having moulded architraves only. It is 37 ft. wide and 24 ft. deep.

At Bathford, on an eminence of Kingsdown and looking north-west, is to be found one of the most finished of Wood's buildings. Titan-Barrow Loggia was erected some fourteen years after Belcombe Brook Villa, in 1748, for Mr. Southwell Piggott. In its central part it bears some resemblance to the general treatment of the latter, though the Corinthian order is here used and small wings are added, the whole front being 46 ft. wide. The drawing-room is of such a height as to include the half-story.

It appears to me that this building would have gained much in dignity if it had been raised on a substructure, though on the spot the want of it is to a great extent lessened by the fact of a terrace of grass in front of the house being carried down very abruptly, and it is from the ground at the foot of this terrace that the finest point of view must be obtained.

The mansion of Prior Park was the largest and best work of Wood, and was begun about 1735. Let him speak as to its origin: "The reflection cast upon the freestone of the hills of Bath brought him (Mr. Allen) to a resolution to exhibit it in a seat which he had determined to build for himself near his works, to much greater advantage and in much greater variety of uses than it had ever appeared in any other structure. Thus it was that Ralph Allen, whose little house in Lilliput-alley we have seen, came to build himself such a vast country mansion."

The scheme of the design was three-fold—a central mansion with east and west wings and a pavilion placed between these three more important buildings, the mansion occupying about 150 ft., and the whole line of building from end to end about 1,200 to 1,300 ft. in length. The south side of the mansion, facing up the hill towards Combe Down, and at a height of about 460 ft. above sea level, consists of a hexastyle Ionic front with attached columns, and this forms the entrance; the windows on either side are simple in the extreme, bearing a strong contrast to those on the north side and the two ends. Immediately below the cornice there were originally windows along the frieze, which gave light to the garrets; they are now nearly all blocked up. The basement story lies in an area and there are no balusters in the parapet.

The north side looking towards the city is a fine front and is full of detail. In the first place the natural slope of the ground allowed of the basement being entirely exposed as shown on the elevation which is the original design of Wood, who had never intended the flight of steps as now seen, although I cannot help thinking that this has added greatly to the dignity of the building. The fine projecting hexastyle portico was intended to be a rival, and something more, to the one which the architect, Colin Campbell, had erected at Wanstead House, in Essex, for whereas that one had columns of 3 ft. in diameter, these were 3 ft. 1½ in., and on the return side are two complete intervals between the columns instead of one and a small portion of another as at Wanstead.

On this front and the two ends there is an open balustrade, and the windows of the ground and first floors are dressed with moulded architraves and heads, those on the ground floor resembling the ones which are seen in the villa at Belcombe Brook. Originally the detail of these was intended to be richer still.

A word or two as to the building of this house, as Wood gives it: 800 tons or 16,000 cubic feet of freestone in large blocks are buried underground to make the foundation walls as strong as the nature of the ground seemed to require. After this the walls of the basement were built inside and out with freestone, the ceilings of the rooms and passages were arched or vaulted over in stone, and the floor was paved with a harder kind called ragstone. These rooms are 12 ft. high in the clear, and the passage, which runs through the length of the house, is 11 ft. lower in height and is divided into five parts, being the chief ornament of this portion of the house, while the architraves of the door cases were moulded upon their external faces. The ground floor was 16 ft.

high. The hall, which extends from front to back of the building, and has eight Corinthian columns to support the floor above, was originally covered over entirely, but has now been opened in the middle so that one sees from below the cove and ceiling of the upper story, the former with its rich ornamental plaster work. The pilasters and caps are of stone.

The walls of the ground floor are built entirely of freestone both outside and in, and the fixed ornamental parts of the hall and other parts were originally of stone also, though those of the dining and drawing rooms were afterwards cut off, and these rooms lined with wood. There is great refinement in the door-head of the dining-room, and the mouldings of the door panels are also enriched. It is curious to contrast this with the naturalesque treatment in the pilasters.

Of much the same general character is the drawing-room, but an elaborate mass of carving over the fireplace, wonderful as it may be, seems inconsistent with the dignity of the other parts. This carving is said to have come from Hound-street House. The type of fireplace is not uncommon in Bath.

In the west wing of the mansion, which was finished in 1737, and was the first part completed, is a fine piece of vaulting, which is one of the best bits of architecture in the whole building. The pendentives are crowned with a small flat dome. This was intended for stables and coachhouse and such-like buildings, and was simple in its first design; like other parts, it was lined with freestone.

The east wing was altered from Wood's design. It shows a good three-light window at the first floor, with a Doric entrance below.

Prior Park was finished in 1743. Two fine sweeps of stone steps with balustrades and vases form an architectural treatment of the gardens below the great portico. They were executed by Bishop Baines about 1830.

At the foot of the slope lies the Palladian Bridge, considered to be the work of Wood. Here are the old fishponds once belonging to the Priory of Bath, and from which Prior Park takes its name.

The interior of the bridge is well treated. Except the ceiling all is of stone, and the entablature has the swelling frieze, which Wood was so fond of. The balusters here are of a rather unusual type, being Venetian in character, and it must be admitted are not like those which he usually designed.

Before leaving Prior Park I should like to show you a view of the stone staircase of a later date in the west wing; and also a doorway in the present church which was brought from Hound-street House, near Shepton Mallet, on the destruction of that place about the year 1848. The work upon it is the most refined of any to be seen in this district, and, indeed, it may have been brought from Italy.

When Wood's scheme for building a grand parade on the south side of Queen-square was abandoned and Wood-street, which had been intended to be 100 ft. wide, was reduced to about half that amount, Wood turned his attention to the large space at the south-east side of the city, and began to lay out his ground and buildings on a large scale. This space was the old Abbey Orchard, and the plan will show his ideas, and how far they were carried out. At the top left hand corner is seen the east end of the Abbey, and to the right the Orange Grove; on the south is St. Peter's Gate, leading thence to the Terrace Walk, where on the east side are Harrison's Rooms and on the west Lindsay's Assembly House, which Wood completed in 1730. West of this lay Mr. Allen's garden and town house, abutting on to Lilliput-alley on one side, while his garden ran northwards as far as the Abbey Church. The triangular space between this part and the river was to be a spacious open area called St. James's Triangle, with the Grand Parade south of it, then some large blocks of houses and the Royal Forum beyond that again, facing to the south, now known as the South Parade, and still more buildings beyond.

The first stone of the first house of the Grand Parade (now North Parade) was laid on March 10, 1739-1740. It was intended to have adorned the middle block of buildings with Corinthian columns and pilasters, but through a scheme which came about among the tenants the ornament was cast aside and the whole executed in a plain manner, as we see it to-day.

The Royal Forum, or South Parade, was begun in January, 1742-43.

The opening under the house on the west of Pierpont-street was called St. James's Portico, and was erected by Wood, as well as the houses in the same street.

At the end of Lilliput-alley, now North Parade-passage, is a house which is interesting as showing one of the few shop fronts on the ground floor now remaining in Bath as originally designed.

A doorway also near here may be noticed as showing the original conception of the glazed door.

Another shop front may be seen at the north-east angle of the Abbey churchyard.

South of Ralph Allen's town house, and little known or appreciated, there lies a large court built by Wood, with good houses on either side, of about the date 1740, having doorways with the Corinthian order and often with panelled walls inside, good staircases, and much finish of detail. They are North Parade-buildings, formerly called Gallaway's-buildings. The best one is that on the west side at the bottom. The hall is vaulted in plaster, and with a boldly-carved arch springing from pilasters on either side; a step or two further and we see the whole staircase from top to bottom at one glance.

The landing on the second floor having to be set back, and fortunately there being no girders in those days, the superincumbent wall is supported on an ornamented wood beam sustained by two Ionic columns.

One room must suffice as the typical interior. The fireplace is of well-moulded stonework, the walls are panelled, and the cornice is full of detail, though, unfortunately, now filled in with whitewash. I am pleased to say that this house is particularly well kept up and rather suffers from too much paint than the want of it.

At the west side of Orange-grove stood until quite recently an edifice known as Nassau House. It was probably designed and first occupied by Richard Boyle, fourth Earl of Cork and Burlington, about 1730. He was a companion of Pope. After his death in 1753, the house became the Bath residence of the Earl of Howth about 1780, whose daughter Lady Francis St. Lawrence married in 1808 the Rector and Archdeacon of Bath, the Rev. J. Phillott.

The chief point of interest in the interior was the staircase.

The name "grove" is derived from the trees that were planted in it, and it was called "Orange" on account of the visit of the Prince of Orange, in commemoration of whom the obelisk in the centre of the Grove was erected in 1734 after the Prince's restoration to health through drinking the Bath waters. It was here that the chairman would bring those who were going to take the waters, and who afterwards returned to the Grove for conversation or a little constitutional.

It is probable that the same Earl whom we have just mentioned built the house in the Abbey Yard, known as Marshall Wade's, at a little later period than Nassau House. It was this Marshall Wade who was four times M.P. for Bath, and who greatly benefited this part of the city by making a passage between the houses on the north side of the Abbey, so that those who wished to walk from the Pump Room to the Orange Grove might do so without entering the church, the north aisle of which had previously served the same purpose. These houses still existed in 1829, as shown on an engraving of that date.

There seems to have been considerable difficulty in the commencement of the Mineral Water Hospital, called then the General Hospital.

The site at first proposed in 1727 was on the north corner of the Ambrey. In 1730 plans were made, but disputes occurring in the conveyance of the land, which involved a delay of many years, the trustees determined to seek a new site, and in 1737 accepted the offer of a piece of ground in the north part of the city. A new set of plans was made in 1738, the work of demolishing the old houses was commenced, and the first stone was laid on July 6 (as seen in the inscription on the east side of the building). Let Wood give his own description of it: "The Hospital as it was finally fixed upon the 25th of August, 1738, became a magnificent pile of buildings, of the Ionick Order, consisting of a Ground, Principal and Chamber Story, and extending 99 feet in front to the North, 84 feet on the West, and 97 feet on the East. The E. and W. sides are parallel, but they are not at right

angles with the N. front, which contains five windows on each side the door, and the central part of it makes a Teatrayste Frontispiece of almost whole columns, elevated upon a large Plinth and finished with a Pediment, whose tympanum was proposed to be adorned with a bas-relief, representing the good Samaritan." This piece of sculpture was omitted, but at a later time was executed by Mr. Elkington Gill in the tympanum of the additional building. The hospital was finished in 1742. The stone and other materials for this building were provided by Ralph Allen.

Although Wood prepared the designs for the Grammar School in Broad-street, it is not known that he executed the building. He says that the committee appointed by the Corporation, after proposing to lay out about 3,150l. in the purchase of ground and in erecting a building thereon, proceeded no farther than to employ him to make a proper design for it, which he completed on September 10, 1742. The architraves round the windows have been cut away to form splay. As shown by the maps of the period, the building seems to have been erected some time between 1750 and 1760.

The "History of Bath," published by John Wood the elder in 1749, though in part a chimerical work, is a valuable addition to the records of the state of the city during the first half of the eighteenth century.

Gay-street was designed by the elder Wood, but executed by his son, and it was in the house at the corner of Queen-square and Gay-street that the younger Wood lived.

The rooms of the circular bay here are planned as a rectangle with an apse at each end, that facing outwards forming the window, which on the ground floor is treated simply, with rusticated blocks between the architraves; but on the upper floor coupled Ionic columns between and on each side of the lights help to enrich the fine Venetian window. It is, I think, the only instance of Wood having used a circular bay.

The interior is treated with long panels and an enriched plaster cornice. There are Corinthian columns standing at the two angles of the apse, and Ionic pilasters with a pediment over mark the door in the centre of the same: all these are executed in wood and painted.

The panel on this house shows that John Wood the younger was born in 1727 and died in 1781.

The Circus, also designed by the elder Wood, was carried out by his son. It was in 1753, the year before his death, that John Wood the elder entered into an indenture with the Right Hon. William Pitt for the building of a house here; this was No. 7. The buildings were begun in 1754, and they took fifteen years in completion.

A writer at the beginning of the nineteenth century says there was a shrubbery in the middle of the enclosure and a gravel walk surrounding a reservoir, which supplied the houses with water. This was, of course, the Circus Waterworks; they are now closed over, but I do not know how long the plane trees that are there have existed. It was at No. 24 that Thomas Gainsborough painted some of his most famous portraits. I should like to point out here that the æsthetic sympathy of the younger Wood with his father is a remarkable feature in his buildings, and it seems to me not unlikely that as Gay-street and the Circus were the designs of the elder Wood, they may have conferred together as to the buildings west of them, and that the younger Wood may have been guided in their development by the advice left him by his deceased father; at any rate, in the Crescent exactly the same use of the order is seen as in Queen-square, though less elaborately worked out, and in the Assembly Rooms the broad treatment of spaces externally and internally is observable as in the work of the elder Wood.

It may not be amiss to make some little comparison between the Circus and the Crescent. Given the idea of a circular line of buildings, the design is largely modified by the space at disposal, and it is very evident that in elaborating the Circus with three distinct orders—Doric, Ionic, and Corinthian—all with coupled columns and with bands of ornament at the lower story in the frieze, and at the top story between the capitals, and a stone ornament crowning each coupled order, Wood intended to impress the spectator from a near point of view, knowing well that in such a form a distant view would be impossible. For this reason there is much interest in close examination of this work, and

the truth of the design is enhanced by the orders being confined to their respective stories.

But in point of dignity and bold conception it must yield to the Crescent, the very situation of which lends a great charm to its imposing effect. It appears to the spectator almost suddenly, with a broad sweep of lawn stretching in front of it from end to end. The scheme is simple; an entirely plain basement story supports a large Ionic order, which rises through two stories, and is crowned with a very deep entablature. The parapet is an open balustrade, but there are no ornaments over the dies; it needs none. The effect is obtained by the dominating order and the bold sweeping circular lines over, unbroken to the roof. Detail is not looked for; it would serve no purpose, but would destroy the dignified simplicity of the whole. At the same time it must be admitted that this effect is gained by a less legitimate use of the order than in the Circus. It should be noted that originally the roofs, as indeed the roofs throughout Bath, were covered with stone tiles, and a more artistic covering can hardly be conceived. The eye is thus carried up to the topmost part of the building, and sees it as one harmonious whole. The Crescent, which, as we have seen, was the work of the younger Wood, whose buildings we are now considering, was begun in 1767, but not finished till about eight years after.

The diameter of the circus from house to house is about 320 ft., and the major axis of the crescent (an eclipse on plan) 550 ft. In the interior treatment of the crescent the hall has usually an arch with enriched panels in the soffit.

The staircase walls are panelled out with plaster mouldings, and are sometimes enriched with festoons and paterae.

The walls of the principal rooms are also panelled, and the door heads enriched with carving.

But the ceilings are the chief means of decoration. The enrichment is nearly always in low relief, though occasionally small subjects such as birds are introduced in the centre in very high relief. The panelling is at times set out geometrically, concentric circles occupying the width of the room, with long panels at the two ends, and an enclosing band of ornament running round the four sides, or perhaps divided into still smaller panels with a variety of forms. The cornice is usually very rich.

A still finer treatment is that where there is a circle of ornament in the middle with ornaments radiating from the four corners of the room and a panel between, or where the ceiling becomes almost entirely naturalesque.

While noticing these instances from the Crescent, I should like to draw your attention to a beautiful ceiling which exists at Mr. Wood's shop in Old Bond-street (No. 12), and there is a well-known one also at Stuckey's Bank, in Milsom-street.

The beauty of the fireplaces lies in the simplicity of their design and the restraint in the ornament. The marbles used are chiefly white statuary and some coloured marble such as Siena. Ionic columns are usually employed with the entablature breaking round them.

Two porches of the same order as that in the Circus, and, in fact, belonging to it, stand at the east end of Brock-street. The metopes in the frieze display a great variety of devices, which are carried round the entire Circus.

A drawing of Bath taken about 1757 shows the Circus complete, but no indication of Brock-street or the Crescent. It appears to have been the intention of the Woods to build another street beyond the Crescent, and another Crescent beyond that again, but Marlborough Buildings effectually put at an end any such scheme.

Brock-street was the work of the younger Wood and connects the Circus and the Crescent. In it is Margaret's Chapel, which has a good Venetian window overlooking the street.

The first stone of the New Assembly Rooms in Alfred-street, on the east of the Circus, was laid by Wood in May, 1769, five years after the proposal to build a somewhat similar set of rooms at the north-west corner of Queen-square. The rooms were finished in 1771, at a cost of 20,000l., on ground covering over an acre and a half. They were formerly called the New, or Upper, Rooms. The planning is exceptionally good.

From the hall in the centre of the building

the entrance on the left leads to the large assembly, or ball, room, that in the middle into the octagon, a room 48 ft. in diameter, and that on the right into the smaller assembly or tea room. The entablature over the entrances is supported on Doric columns. The looking-glasses, with their ornaments, are of the same date as the building. In the octagon room is a portrait of Captain Wade, first M.C., painted by Gainsborough, and one of Mr. Tyson, "Arbiter Elegantiarum," 1806. Beyond the octagon lies the card-room, 60 ft. long and 30 ft. wide.

The ballroom, 105 ft. long, 42 ft. wide, and the same in height, is divided in its altitude into three parts. The substructure is plain, but relieved by good doorways; the middle portion has an attached range of Corinthian columns, with three windows at each end and nine on the side facing north. These windows are ingeniously provided with rising and falling shutters. The third portion of the room is occupied by an immense cove, and above is a flat panelled ceiling.

The most interesting portion of the tea-room is that at the back, where six Ionic columns stand forward some little distance and support a gallery on the first floor, which has an equal number of detached Corinthian columns, while an engaged colonnade of the same order runs all round the room. The ceiling over the gallery is flat and deeply recessed, but above the projecting order rises a great cove with very bold ornamented ribs to form the panelling. Between the columns in the gallery is some good ironwork of the period.

The detail of the doorway in this room will show you the general treatment of the parts throughout the building. Between the carved consoles are festoons carved in wood.

Alfred-street was also built by Wood. The doorway of the last house but one on the side opposite to the Assembly Rooms is one of the richest in Bath—that is to say, the richest, good taste being the standard. The house was called Alfred House from the bust of King Alfred over the doorway. The ironwork well represents the customs of those days in the torch-extinguishers placed on either side above the railings.

It was here that Catharine Macaulay lived for some time and wrote her History of England, dealing with the period of the seventeenth century, eight volumes of which were published by Richard Crutwell and the ninth in London.

It is probable that about 1776 Wood rebuilt the Leper's Bath, adjoining the Helting Pump-room. This is a piece of work which is little known.

Originally the balustrade was more visible from the street than at present.

About the same time he built Woolley Church, near Bath, the cupola of which is worthy of note.

Possibly a Classic stone font in the interior is by him also.

In 1779 he built Hardenhuish Church, near Chippenham, a cleverly-designed piece of work. The exterior shows a good steeple. On the side is a three-light Venetian window, and the internal treatment is such that the great thickness of the wall is fully set off by the interior Doric columns being set close to the inside of the wall with a broad arch thrown across corresponding with that on the outside.

John Wood, jun., died in 1781 at the house at Bathaston which his father had built, and the doorway of which we have seen.

Before leaving the history of the Woods I should mention that the Exchange in Bristol was by Wood senior, erected 1740-43; also Redland-court, in the same city, the latter with terraces in the Italian manner.

Shockerwick House, near Box, was built by him in 1750.

There still remain many interesting buildings in Bath which must not be passed over.

Milson-street was probably designed by Robert Lightholder about 1760. He at any rate designed the Octagon Chapel there, which was opened in 1767. The three best houses are on the east side, and together with those between form a fine group, the basement of all the five having been originally rusticated in the manner of the central one, as shown in Nattes' "Views of Bath," published 1806. He also shows a vase on the top of each of the two pediments. It must be confessed, however, that at times Nattes shows a calm indifference to truth in his details.

About this period the Corporation had to rebuild the old Town Hall, and one Thomas

Attwood, who about the year 1762 had built a family house for the Pulteneys in Grove-street on the farther, or Bathwick, side of the river, was instructed to proceed with the matter. This house afterwards became the gaol, and, considering that Attwood's trade was that of a plumber and painter, it shows no little talent. He died, however, from the effects of an accident while the old houses near the Town Hall were being cleared away, and shortly afterwards, in 1774, a plan for a Town Hall and markets was offered by Thomas Baldwin, who was then only twenty-four years of age, having been born in 1750. These were approved by the Corporation and carried out. Thus Baldwin became the chief follower of the Woods. In 1780 he was made City Surveyor, and four years later City Architect.

It will be observed that Baldwin's work has not the strength of that of the Woods, but depends more on surface decoration. However, the recessing of the windows here within a great enclosing arch is a good feature, and the rustication, known as vermiculated, with which the central portion of the lower story is treated, adds immensely to the strength of the whole design.

At this period, nevertheless, the ornamental treatment of interior surfaces was not less beautiful than any that had been before, and the Guildhall contains within its walls perhaps the finest of any.

The soffits of the staircase, as well as the walls and ceiling, were liberally adorned, and the manner of the whole is chaste in the extreme. Notice particularly the semicircular panel at the top of the stairs.

The banqueting-room is without any exception the finest thing of its kind in Bath. At each end is an arched recess with three similar recesses on the one side corresponding with two groups of three windows each and a fireplace on the other. Over the fireplace are the arms of Bath. The Corinthian order extends with its base to about half the height of the room and supports an entablature which is continued all round, broken only at the recesses, the middle one of which on the inside is set back still further to contain the orchestra; above are circular discs at the two ends and oval ones at the side, facing the oval windows. A second cornice runs unbroken round the room above this and here the cove rises up to a large flat ceiling, which is ornamented with three immense circles filled with enriched plaster work, between which are two smaller ones serving as grilles to the ventilators. The raised ornaments on the fireplaces and doors are of wood covered with a coat of fine plaster and this is the usual method adopted in this kind of work in Bath. The building was completed in 1777.

Passing down Bridge-street we come to the Pulteney Bridge, which was built about 1776 from designs by Robert Adam for his patron, William Pulteney, Earl of Bath, that he might have the more ready access to his Bathwick estate.

Beyond this the domestic work of Baldwin is principally seen. In a shop in Argyle-street there remains a good fireplace, carved with pendants and festoons, with musical emblems in the centre. The form of the grate, as well as the technique of its casting, are both highly artistic.

In 1788 Laura-place was commenced.

Great Pulteney-street, which was begun about 1792, was his finest work. It certainly has a very imposing effect, from its great length and width; and the old Sydney Hotel, afterwards Sydney College, at the end, adds considerably to the beauty of it.

The old Pump Room had been finished in 1706. It was much enlarged in 1751. Previous to 1780 Reveley had been commissioned to prepare plans, and work was commenced and carried to a considerable height at the west end. On the appointment of Baldwin as City Surveyor in that year, however, the work was stopped, and he, in his official capacity, had to prepare plans. In 1788 a committee was formed to discuss them with him, together with the estimates, and work appears to have commenced, but difficulties arising between him and the Corporation, it was again suspended. In 1794 John Palmer gave new plans and elevations, and in 1799 the new Pump Room was finished under his direction. The two colonnades were certainly the work of Baldwin, and as the capital adjoining the basement of the Pump Room is worked out of the same stone as the rustication, it would appear that the whole of this front was at least de-

signed and commenced by the same hand, whoever might have carried out the upper part.

The interior of the room is very lofty, and is treated quite simply with a Corinthian order supporting an entablature and cove. In length it is 85 ft. including recesses, in width 46 ft., and in height 34 ft., or 8 ft. less than that of the large assembly room. A statue of Beau Nash is at the further end and underneath a fine clock presented by Mr. Tompion.

In about 1790 Reveley, the architect referred to above, had built Camden-crescent, remarkable for the manner in which the rise of the ground is overcome in the design. The old print in Nattes' coloured views (1806) shows the portion of the Crescent begun at the east end, and which was afterwards taken down because the houses between could not be completed on account of the landslip, those now in existence being built on the solid rock.

In 1789 an Act of Parliament had been obtained for the improvement of the older part of the city, and much was done within the next few years. A new street was built to connect Milson-street with Stall-street, as formerly the back part of the Bear Inn premises served for this purpose. This was Union-street; Cheap-street and Westgate-street were widened, and Bath-street was built, all under Baldwin.

The Ionic colonnade in the latter street forms a very interesting feature with the Cross Bath at the bottom, also erected from Baldwin's designs. This building has some good detail upon it, the Corinthian capitals particularly being very finely worked. At the north end is a portico supported on four columns.

At this period a very large house was commenced at Grosvenor, intended originally for an inn, but which for a long time lay unfinished. It is faced with seven composite columns, and the shafts were to be adorned with three tiers of festoons, though the lowest has not been finished. The cornice is broken at each column. There is a simple Doric portico on the ground floor.

The oval medallions were intended probably to represent Earth, Air, Fire, Water, Spring, and Summer. Of these, the eagle on the left represents Air, the lion Earth, and the whale on the right Water; the others are uncarved. The middle ones would have been for Spring and Summer. This building is now Grosvenor College.

There remains, at 24, High-street, in the old Market Place, a front illustrative of the manner of building at the very close of the century. No doubt the Doric order was once to be seen on the ground floor, but like many more it has been obliterated. The date—1800—is seen in the circular pediment at the top.

I cannot close my paper in a more fitting way than by exhibiting to you the excellent map prepared by Mr. T. Sturge Cotterell, called the Historic Map of Bath. It contains a great deal of interesting information as to the past, and shows the remarkable change which took place during the period which has been under our notice this evening.

The Chairman said they could have but one opinion in regard to the paper, and that was as to its exceptionally valuable character. Mr. Green had not only given them a great deal of most interesting matter in regard to Bath, but he had shown a large number of lantern views, each from photographs taken by himself. There was not much that could be added in the way of discussion, but one point that had struck him was the extraordinary opportunity which had been given to one man to develop the town in which he lived. The case appeared to be unique, and fortunately the opportunity was made the best use of. A local character had been given to the architecture of Bath by this influence of one master mind, and a certain amount of uniformity had been obtained which had, he believed, no parallel in our country. There were harmony, beauty, and dignity, enhanced by a fine local building material. He was afraid that a repetition of such conditions and results would not be likely to occur for a long time to come, even if they ever got public sentiment in favour of a certain uniformity of treatment. Another idea which had suggested itself to him was the value of the speculative architect. When a really qualified architect speculated where a number of buildings like the Bath ones were required for the community, the effect was much more happy than when a number of individuals were concerned in the erection of the buildings of any particular place.

Mr. Matt Garbutt, in proposing a vote of thanks, said although he had been to Bath he had had no idea that there was so much of interest there. The elder Wood appeared to have been responsible for nearly all the architecture of Bath of his period, and his work formed a most interesting study. There had been one or two parallels on a smaller scale in London, where one or two streets had been laid out by one man, but such a chance did not often occur.

Mr. A. T. Bolton, in seconding the vote of thanks, said he did not think a better example could be set before students than what Mr. Green had been doing at Bath. All over the country the old provincial towns were disappearing, and if Association students who came up to London to study would, on their return to their native towns, do what Mr. Green had done at Bath they would render a great service to architecture as well as to the towns. In thirty years' time there would not be a single example of old Birmingham, Leeds, and other towns left, and yet any Londoner going to Birmingham was struck with the old Quaker element of it, and the same with Leeds. It did not strike people on the spot so much, but they would wake up one day to what they had lost. At Brighton people seemed to take an interest in the old topographical aspect of buildings, for in the Pavilion there there is a collection of lithographs which enabled one to form an idea of what Brighton must have been at the time of its greatest glory. There was a great value in the preservation of the old setting. In the case of a novelist, for instance, who was taking the period of Nash and other celebrities at Bath, if a man who was worth his salt, he would want to form an idea of what the streets and walks and buildings were like in which the characters moved, and a book about Bath, such as that which Mr. Green was preparing, would supply a complete mental idea of the town. As to the Bath architecture, what struck an outsider most of all was the smallness of scale, and one had to remember that after all Bath was only a small watering-place, as it were. The scale of the architecture was no doubt really too small; for instance, the orders of the Circus were not much more than 12 ft. and 14 ft. in height, and the columns could hardly be 9 ft., and any one familiar with Italian architecture must feel that the scale of some of the Bath buildings was a great deal too small. In the Circus the orders looked much like umbrellas or walking-sticks; but in the Crescent one did not get that idea, for the orders went up two stories and there was something of the effect of the right classical scale. There was no getting away from the fact that the dignity of classical architecture required a certain indifference to size; and tied down as the elder Wood was in the means at his disposal, he was not able to carry out the Circus on the scale demanded, and in looking at it one had to regard it from the point of view of an architectural model; and if one realised that a certain meanness in regard to the architecture of Bath, which first struck one, was due to that, one would be better able to appreciate what was good in it. Mr. Green had shown some beautiful interior work—staircases, ceilings, &c., which were remarkable. He wished that some one would do the same for old Dublin architecture, for in some of the old houses there there was much that was reminiscent of what was in Bath.

The vote of thanks having been heartily agreed to,

Mr. Green, in reply, said that in the provincial towns there was a great deal hidden away that had to be searched for and brought to light. In Bath, living in the place, it had been an easy matter for him to do that, and people had been very kind in allowing him to go into their houses to take photographs. He was glad the matter of speculation had been noticed. It was the hard-working, speculative master builder Wood who had achieved so much. He seemed to combine the profession of the architect and the business of the builder, and hired men himself to carry out his work. Wood must have had a master mind, and made nothing of difficulties which would have stopped other men. As to the scale of the Circus, he had come to the conclusion that it would have been worse to have made the scale twice its present size. To have made it twice its height would have made the houses uninhabitable. Wood relied on the nearness of view in the Circus. It was entirely different with the Crescent, which could be seen to perfection a long way off. The difficulty was

bound to occur where three orders were used on a building; dignity was sacrificed to detail. As to the book he was about to publish, there was so much of interest in Bath that it seemed desirable to put it in book form as a permanent record of these eighteenth-century buildings, for some of them were bound to disappear.

The Chairman announced that the next meeting would be held on May 10, when a paper would be read by Mr. A. Hinds on "The Protection of Buildings from Lightning."

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association on the 17th inst.—Mr. Henry F. Kerr presiding—Sir John Sibbald read a paper on the Plans of Asylums for the Insane Poor, looked at from the medical and administrative points of view. It was at least helpful if not absolutely necessary, he said, for a proper understanding of such questions to know something of the grounds or which persons familiar with the treatment of the insane had arrived at their present opinions, and this knowledge could be best obtained by taking a general survey of the changes that had occurred in the character of asylum buildings during what might be called the modern epoch. Sir John briefly referred to the kind of buildings in which the insane were lodged previous to the nineteenth century, and mentioned as illustrations the cells attached to the Charity Workhouse and the old Royal Infirmary. The duty of erecting asylums at the public expense was not seriously recognised in this country till the middle of last century, when the English Lunacy Act of 1845 and the Scottish Lunacy Act of 1857 laid this duty upon localities, and conferred on them powers for obtaining the necessary funds. To illustrate the growth of opinion in regard to asylums since that time, Sir John first referred to the plans of the Derby County Asylum, which was opened in 1851. He then drew attention to the plans of the London County Asylum at Bexley, which was opened in 1898, and referred to the improvements which showed themselves in the more recent plan. Among these it was noticed that the several wards into which the accommodation for patients is divided no longer consist, as they did at Derby, of rows of cells in prison-like galleries, identical in plan, but they are each specially designed for the patients they are to accommodate, according to the requirements of their different bodily and mental conditions—those requiring hospital treatment, for example, being placed in wards arranged like those of an hospital, and those in good bodily health, and whose mental condition does not require them to be housed differently from sane persons, being placed in wards of more home-like character. He pointed out that this type of asylum, which he called the aggregated pavilion type, differed from the next type to which he drew attention, chiefly by the several wards being connected to other wards either by being portions of the same building or by the existence of corridors of communication. The type in which the wards consist of separate and independent buildings he called the segregated pavilion or village type; and he illustrated it by reference to the plans of the Prussian asylum at Alt-Scherbitz and of other more recently erected asylums of the same type. He gave a number of reasons which, in his opinion, justified a preference for the segregated pavilion or village type. Among these he mentioned the importance of making the buildings and everything else about an asylum as likely as possible to have a beneficial influence on the minds of the patients; and he showed that it was difficult to prevent a huge building which was neither a palace nor a manufactory from being, both inside and out, gloomy and prison-like. He was also of opinion that where each ward was a completely independent building its arrangements could be made more efficient, both from the general points of view of cheerfulness and health and from the special point of view of the adaptation of each ward to its own purposes. He said that he thought the objections to the segregated buildings that had been raised from the administrative point of view were sufficiently met by the fact that they received no support from those who have had the actual administration of a village asylum. He

alluded to the fact that it was proposed to erect the new Edinburgh Asylum on the village type, but did not make special reference to the Bangour plans, as they had not yet been finally adopted by the District Lunacy Board or approved of by the General Lunacy Board. In the course of the paper Sir John drew attention to the difference in practice north and south of the Tweed in regard to the courts surrounded by high walls which were at one time attached to asylums as well as prisons, and which are generally known as airing courts. He said that in Scotland the use of these airing courts had fallen into disfavour as early as 1869, and in that year the walls were removed and the airing courts abolished in one asylum. Since then the walls had either been removed, or lowered so much as to cease to be restrictive, in nearly every Scottish asylum, and in no Scottish asylum erected since 1869 had any airing courts been provided. In English asylums, on the contrary, airing courts were still in general use, and he quoted from the English Commissioners' reports to show that in at least three of the London County Asylums from one-fourth to one-third of the inmates never took exercise beyond the airing courts. He strongly advocated the abolition of these airing courts. Another point to which he drew attention was a recent movement—to which he gave his support—for the diminution of the practice of locking up in single rooms during night-time the noisy, the excited, and others of the more troublesome patients, and he spoke strongly in favour of the great increase in recent years both in the amount and the efficiency of the night-nursing given to such patients, and he showed how such a change in the mode of treating them should affect the plans of future asylums.

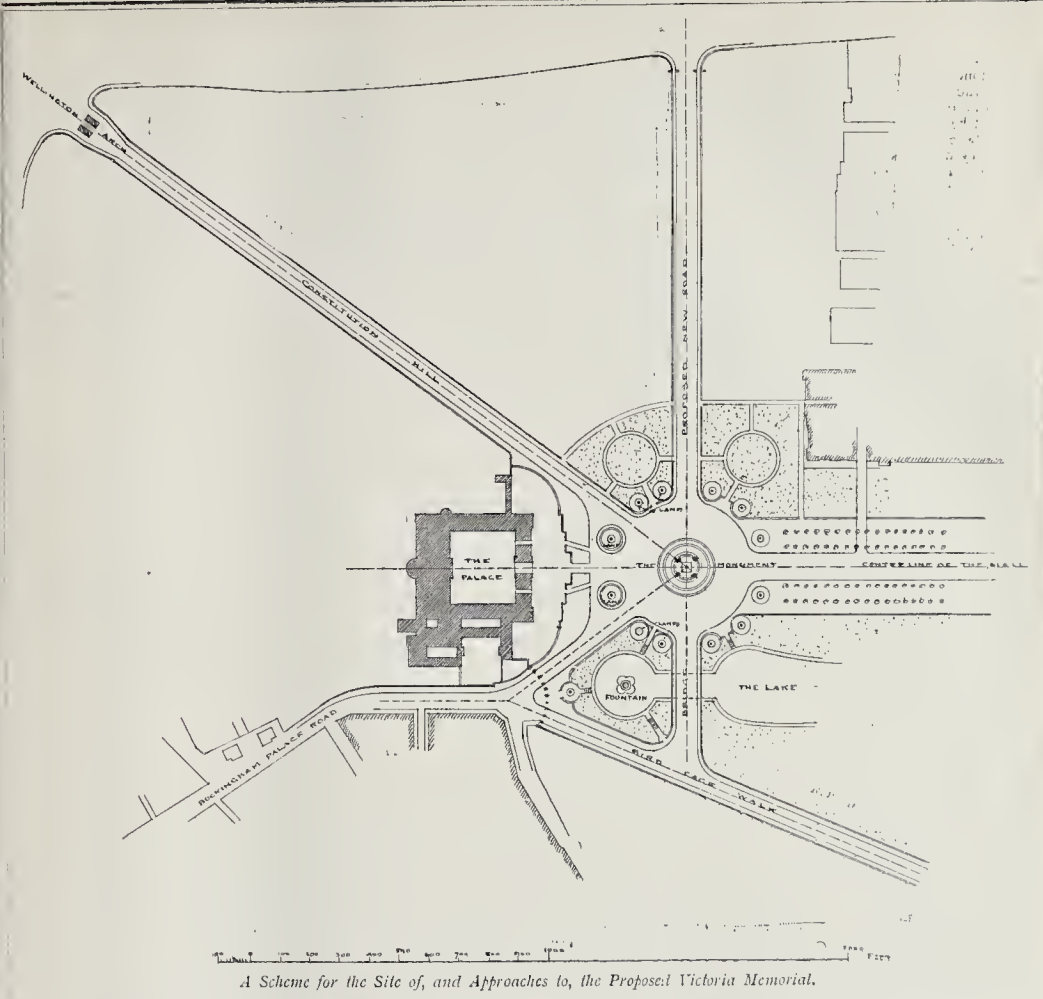
CARDIFF ARCHITECTS' SOCIETY.—The annual dinner of the Cardiff, South Wales, and Monmouthshire Architects' Society was held on the 20th inst. at the Royal Hotel, Mr. George Thomas, F.S.I., President, presiding. Mr. Downing, in responding to the toast of "The Society," said he could not speak in very congratulatory terms of the present state of architectural practice in the district. The building trade had not yet recovered from the effects of the recent coal strike. Alluding to public work, the speaker mentioned the new municipal buildings, and said he anticipated that they would be worthy of the reputation of Cardiff. The promotion of the study of architecture as an art and science, observed the speaker, was worthy of the consideration of the Welsh educational bodies. "The Master Builders" were toasted by Mr. H. V. Lancaster, and Mr. W. Thomas replied. The speakers to the other toasts included the President, Alderman D. Jones, Mr. Dashwood Capel, Rev. A. Henderson, Mr. John Sankey, Colonel Hopkins, Mr. Edwin Seward, Mr. Lewis Williams, Alderman Rainsdale, and Mr. D. Morgan.

COMPETITIONS.

BANK BUILDINGS, LEEDS.—In a recent competition for bank buildings at Leeds, the first premiated design was that sent in by Messrs. Oliver & Dodgshun, of Leeds; the second premiated design was by Messrs. Perkin & Bulmer, Leeds.

RESTORATION OF CHURCH, LONGRIDGE.—The church of St. Lawrence, Longridge, near Preston, which has been in course of restoration for a considerable period, has been reopened. The present restoration includes the reflooring, reseating, and reeroofing of the structure, the rebuilding and enlargement of the chancel and vestry, the erection of a new west entrance and baptistry, the reseating of the gallery, and other improvements, which have been effected from the designs and under the superintendence of Mr. J. A. Seward, architect, of Preston. The cost of the work was about 2,500l.

SCHOOLS FOR STEPNEY CHILDREN, STIFFORD.—Mr. J. Whyte Harper laid the foundation-stone on the 15th inst. of the new schools being built for the Stepney Guardians at Stifford, Essex. The cost of the site was 10,000l., and eighty acres of land had been purchased by the guardians. It was proposed to build two blocks, each accommodating sixty children, and four semi-detached cottages, each accommodating fifteen children, with the usual offices, swimming baths, laundry, &c. The children, it is hoped, will be educated at the Stifford Board schools, while the elder girls will look after the infants, and there will be a store at which the girls will purchase the articles required for the daily life of the homes, and thus fit themselves for their part in life when they leave the schools. The architect is Mr. Baggallay, and the builders are Messrs. Wall, of Chelsea.



THE QUEEN VICTORIA MEMORIAL.

SIR,—In the plan which has been published in a contemporary daily paper of the proposed "Place" to be formed in front of Buckingham Palace, the monument does not seem to be sufficiently emphasised. The Mall, and the Mall only, has a vista culminating in it.

In the plan, which I enclose herewith, the monument would be in a circular "Place" with five roads leading up to and concentrating attention on it. I beg to briefly explain.

At the bottom of Constitution Hill there is at present a bend; by slightly setting back the railing of the Palace forecourt the road is continued in a straight line from the Wellington Arch to the Mall and the monument placed at the intersection. The road from the Buckingham Palace-road is brought in so as to make the same angle with the Mall as Constitution Hill. A new road is proposed leading from the monument up through Green Park to Piccadilly, and this road is continued southwards to Birdcage-walk, being taken over the lake, the end of which is re-arranged by a bridge. The southern end would be useful for diverting the cab traffic away from the Palace on Drawing Room days, and the northern would make a fine approach from Piccadilly.

The monument is further from the Palace than in the published plan, and therefore would not clash so much with its inferior architecture.

PLAN THE BASIS OF DESIGN.

CONGREGATIONAL CHURCH AT WARING GREEN, BRIGHOUSE.—Two memorial-stones in connexion with the erection of a new Congregational church at Waring Green, Brighouse, were laid recently. Messrs. Sharp & Waller are the architects for the building.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held at the Rooms, No. 9, Conduit-street, Regent-street, W., on Monday evening, Mr. E. A. Gruning (Vice-President) in the chair.

The minutes having been taken as read, The Chairman moved "That the resolution of the Royal Institute suspending By-law 26 for one year, passed at a special general meeting on April 15, now be confirmed."

Mr. Alex. Graham (Hon. Secretary) seconded the motion, and it was carried.

Mr. W. J. Locke (Secretary) reported that three candidates attended the examination for the office of Building Surveyor, and the successful one was Mr. James Edwin Webb, Nottingham. There were also three candidates for the examination for District Surveyor, the successful of whom were Mr. Sidney Joseph Halse, Fulham, S.W., and Mr. F. Sizer Capon, Streatham Common.

Classification of Romanesque Architecture.

Mr. Francis Bond, M.A., then read a paper on "The Classification of Romanesque Architecture," of which the following is an abstract:—

In introducing his subject the author alluded to some of the difficulties which beset the student on his first introduction to the great style which preceded Gothic and was based on Roman work. This subject of the classification of the Romanesque styles was a large one, and could only be dealt with shortly within the limits of his paper. Classifications already existed—those of De Caumont, Quicherat, Viollet-le-Duc, and particularly Anthonyme Saint-

Paul, were referred to—but they helped one but little forward. It remained to consider whether a wider basis of classification could not be found—one resting on the main facts of plan and structure.

First of all, what was the one thing that the old builders—whatever the schools they belonged to—were trying to do? With the exception of a certain number of them who were attempting to solve the church-building problem by following the type of St. Stefano Rotondo at Rome or of St. Vitale at Ravenna, and whose furthest outposts, with the exception of the churches of the Knights Templars and the Knights Hospitallers, are to be found in the churches of Aix-la-Chapelle, Ottmarshheim, and Gernigny-des-Prés, all the builders of Western Europe, from the ninth century, when Romanesque architecture commenced, to the twelfth century, when it was superseded by Gothic, were engrossed with one supreme problem—how to vault a basilica. This was the master-problem of the builders of the Middle Ages from the end of the ninth to the middle of the twelfth century. The amount of engineering skill, the ingenuity, and the variety of the solutions proposed were astonishing. They seemed never to have had their full due. Gothic architecture got nearly all the credit. As a matter of fact, every single one of the main difficulties inherent in the task had been effectually met—and met in more than one way—before the first Gothic architect ever handled a trowel. Early in the twelfth century, or before, at least five complete solutions had been arrived at, as may be seen at Le Puy, Tournus, Cluny, Speyer, and Durham.

The problem how to vault a basilica meant—(1) that there were to be aisles as well as a high nave; (2) that some form of vault construction was to be devised; (3) that since a vault of stone was heavy, piers must be substituted for graceful, but weak, classical columns; (4) that the thrusts of the high vault of the nave must be stopped in some way by abutment in or above the aisles; (5) that top-lighting by clearstory windows was to be retained; (6) that the outer surface of the vault must be protected from the weather.

I. In most cases one or more of these conditions were evaded. One school—the most ancient of all, which held the whole of the field till the ninth century—simplified the problem by omitting the vault and retaining the colonnade.

II. A second solution—also very incomplete—was to omit the aisles; to build a hall-church roofed with a tunnel vault. This simplified the question of supports, for it substituted solid walls for hollow arches, any amount of clearstory light could be introduced, and the walls could be thickened to any extent to provide continuous abutment to the thrust of the great tunnel vault. Everywhere it was the natural and proper solution where only a small church was required, but it was employed in Provence even in churches of cathedral rank.

III. A third method, represented by the school of Périgueux, also removes the difficulties of supports, abutment, and top-lighting by eliminating the aisles. It presents us with another variety of hall-church, roofed, not with a tunnel, but a row of domes, and it is to be noted that the corners of each square bay of the nave are filled in with pendentives to support the dome.

IV. The next method is found only in the church of Loches, near Tours. Originally there was a low tunnel-vaulted nave, without aisles, of the eleventh century. But about 1160 the eastern portions of the nave were pulled down, two square bays were formed, and on these bays two spires were erected.

V. In two churches of the first rank a row of domes was employed to roof an aisled nave. The nave was spanned by a series of strong arches. These were so placed as to divide the nave into square compartments. On each square an octagonal dome was poised, the corners of the square being filled up with corbelling or squinches to afford support all round to the base of the dome. The typical example of this is the wonderful cathedral of Le Puy, the nave of which is roofed by a row of six domes on squinches.

VI. The next method may be distinguished as the arch-and-lintel system. Strong transverse arches were built across the nave about 9 ft. apart; a wall was built on each arch rising up to the apex of the arch, and then lintels of basalt were laid longitudinally—i.e., from west to east. Count Vogüé has fully illustrated this curious phase of architectural history in *La Syrie centrale*.

VII. We next come to a whole series of attempts to solve the problem by covering an aisled nave with what is called a tunnel, wagon, barrel, or cradle-vault. Of these the most scientific is that of Tournus Abbey church. As in the churches of Syria, the nave was spanned by stout arches, each arch carrying a wall. But each pair of these walls, instead of carrying lintels, as in Syria, carries a short tunnel set *transversely*.

VIII. We now come to the vast number of churches in which the tunnel-vault of the nave was placed longitudinally—i.e., in the direction of the axis of the church. The naves vaulted with longitudinal tunnels may be divided into those (a) where the tunnel rests on a pier-arcade; (b) where the tunnel rests on the arches of an upper vaulted aisle; (c) where the tunnel rests on a wall pierced with clearstory windows.

IX. Such interiors as that of Notre-Dame de Poitiers were painfully low. It would have been dangerous, however, to raise the tunnel much by increasing the height of the piers. So, in Auvergne especially, the expedient was hit upon of building two aisles instead of one, both vaulted; then the tunnel could spring at a much higher level. Moreover, some of the gloom of the Poitevin type of nave could be dispelled by piercing the back wall of the new upper aisle with windows.

X. The first step to carry out the one unfulfilled condition in the problem—the provision of clearstory light—was taken by piercing the base of the tunnel itself with clearstory windows. The final step—a most important

change—was to insert the windows wholly in a clearstory wall. This latter seems to have been accomplished independently in the south, in Provence and Languedoc; in the north, in Burgundy. The clearstory was already in use in tunnel-vaulted churches in the eleventh century at Saint-Guilhem-du-Désert, in the Southern Cevennes; and in Burgundy on a small scale at Saint-Benoît-sur-Loire (commenced 1062), and on a gigantic scale at Cluny (commenced 1089).

XI. This solution, which was destined, within a generation or two, to culminate in the Gothic architecture of Saint-Denis (1140), consists in covering a nave with unribbed groined vaults.

XII. The final step was to substitute the ribbed for the groined vault; to dispose the vaulting compartments of the nave in oblongs, to facilitate the vaulting of these oblongs, by the application of the pointed arch, and to transmit the thrusts of the high vault by means of flying buttresses to the buttresses of the aisle walls. To this, Gothic architecture added three developments: (1) It weighted the buttresses with pinnacles; (2) to a large extent it replaced the masonry of the walls by glass; (3) in Durham nave, the Abbaye-aux-Dames, and elsewhere, abutment was sometimes provided by flying buttresses disposed beneath the aisle roof. In Gothic the flying buttresses are placed above the aisle roof.

XIII. This method, which consisted in omitting the vault, was no solution at all. The nave is not constructed in genuine basilical fashion, as in the first method, but is built as if a vault were intended. The home of this unworthy construction is Normandy.

Of the above solutions of the vaulting problem, the third, the employment of a dome resting on pendentives, is by itself a full and satisfactory criterion. It occurs nowhere except in a group of some thirty-five churches in the district of Périgueux, with such "outliers" as Fontevrault and Angoulême. No. 2, the hall-church, is most common in the southwest and south of France, from Poitou to Provence. It may be vaulted either with a longitudinal tunnel or with groined or ribbed vaults. No. 3, where a tunnel-vault rests directly on the pier arches, occupies much the same districts as No. 2. No. 9, where the tunnel rests on the arches of an upper aisle, extends from Clermont-Ferrand, in Auvergne, to the south-west as far as Conques and Toulouse. No. 10a, where the tunnel is combined with a triforium and clearstory, is the final development reached in Burgundy. No. 10b, where there is tunnel and clearstory, but no triforium, is the solution of Provence and of Piedmont. No. 12, the ribbed vault, occurs sporadically, except in Germany and Lombardy, where it is characteristic. No. 13, the unvaulted nave, was nearly universal in Normandy and England till the twelfth century was well advanced.

The author went on to consider how these eight divisions will stand other tests. A very important test is afforded by the planning of a church, especially of its eastern limb. It must suffice to trace four main types of choir-plan. The first is that with three parallel eastern apses, of which there is a variant with square-ended aisles, as at Cerisy-la-Forêt, and another with aisles square externally and semicircular internally, as at Romsey. This is pre-eminently the plan where the unvaulted nave prevails, viz., Normandy. It is frequent in Lombardy and in those Provençal churches that have aisles. A second plan is that of the ambulatory and "chevet." It is rare in Germany, Lombardy, and Provence, and non-existent in Normandy (excluding England).

The plans alone, apart from other considerations, would entitle Germany to rank as a distinct architectural province. In Provence the aisled churches generally have three parallel eastern apses.

The divisions may be tested again by the treatment of the central tower: (1) its vaulting; (2) its shape, whether square or octagonal.

The Romanesque builders had three forms of vault at their disposal in the eleventh century: the groined vault, the tunnel-vault, and the dome. The most difficult problem they had to cope with in vaulting was the question of putting a vault over the crossing, resting not on walls, but on four unbuttressed legs. They had hardly dared yet to put a groined vault over their naves, fearing its concentrated thrusts. Their favourite tunnel-vault could not be used at all at the crossing, for it needed

solid walls for its support. They had perforce to use the dome, in all cases, except in the Périgueux district, resting on squinches. Secondly, they had to stop the thrusts of this dome by carrying up a central tower to weight the arches or walling on which the dome rested. As regards the shape of this tower, they had two alternatives. The crossing was square, and so the tower over it might be square, as was the great central tower of Cluny and that of Tournus. But the squinches reduced the square of the crossing to an octagon, and as the tower rested directly on the octagon, and not on the square, it was more natural that the tower also should be octagonal. Hence that magnificent series of octagonal central towers in Burgundy and Southern France, Germany, and Lombardy, culminating at Mayence and Saint-Sernin, Toulouse. In Normandy and England, on the other hand, the builders hardly ever dared to vault their naves at that early date, and never the crossing. And there being no dome in an Anglo-Norman tower, it is square.

Another test is afforded by the grouping of the towers. (1) The glorification of the tower reaches its highest pitch in Germany. Six towers are found at Speyer, Worms, and Laach, seven at Limburg. (2) In Burgundy the magnificent tower-group of Cluny seems to have remained without a rival. Its daughter churches were satisfied with a triplet; an octagonal central tower and two square western towers was the favourite arrangement. The towers have several stages, similar in form. (3) In Normandy also the triplet was the favourite, but the central tower was square, and not domed internally. (4) In Poitou the characteristic is the conical spire, "en pomme de pin," which often surmounts the tower. (5) In the Périgordian region is seen the same conical spire, together with the characteristic cupolas. (6) In Provence "a simple square tower is common, with a very low spire." But some have central octagons. (7) In Auvergne a specially characteristic arrangement is that of a square western tower in the centre of the façade and a central octagon. (8) In Northern Italy the campanile type greatly predominates, and where the massive Romanesque tower is found, it is usually divided (in campanile fashion) into very numerous stages. Nowhere, except in the Como churches, does the campanile form part of the structure of the church; often it is quite detached.

Summary.—We may discriminate the following eight schools of Romanesque:—I, the Périgordian; II, the Poitevin; III, the Provençal; IV, the Auvergne; V, the Burgundian; VI, the Norman; VII, the German; VIII, the Lombardic.

As regards the above classification, one word of caution is necessary. In speaking, e.g., of the style or school of Auvergne, it is not meant that all the churches in Auvergne were built in this style, or that there were no such churches outside Auvergne, but merely that such churches were more common in Auvergne than elsewhere, and may therefore for convenience be described as belonging to the style or school of Auvergne. Also that those features described as characteristic were not invariably found; they were merely those which occurred most frequently.

One is tempted to try to work out the relations to one another of the different schools. Certain resemblances are patent. The superposed aisles link the style of Lombardy to that of Auvergne; German Romanesque is connected with Lombardic on the one hand, and with Norman on the other. But a much more exhaustive classification is necessary before any results of lasting value are likely to be obtained.

Still stronger is the temptation to inquire into the origins of all the Romanesque styles; whether they are derivatives, as some have held, from Provence, or, as others have held, from Lombardy. Such architectural pedigrees are not, as a rule, trustworthy. And there always remains an alternative hypothesis, which seems to have within it much of truth, viz., that the styles were none of them mainly derivative, but that the same problem was engaging all the different regions more or less simultaneously; that the builders of each region were solving it, with some little light, indeed, from their neighbours, but mainly independently, by empirical experiments of their own, aided by the survival here and there of traditions of Roman construction, and by the study of local Roman monuments.

Another caution requisite is that the classi-

fication does not cover the whole ground. This is necessarily so. Between each region and the next there was always a debatable ground, where two or more styles would be in simultaneous use. Indeed, a "pure" region would be the exception; the greater part of the area of any one country would employ mixtures of style. England is an instance.

It had always been customary, the author believed, to regard the Romanesque of England and Normandy as one. The Romanesque of Normandy, however, seemed to be a "pure" style, and that of England a "mixed" style. While by far the most important factor is the influence of such pre-Conquest churches as Bernay, Jumèges, and the Abbaye-aux-Hommes, we must also attribute some degree of importance, at any rate in the planning, to the highly developed Romanesque of Auvergne and Burgundy.

The lecture was illustrated by a numerous and interesting series of lantern slides, mainly from photographs taken by the author himself.

Colonel Prendergast, I.I.A., said he had the pleasure of proposing a vote of thanks to Mr. Bond for the very important paper they had heard read. The subject which had been treated so ably that night was so great that there was no time to give the historical part of it. It so happened that he had recently made some researches connected with the buildings they had had shown them that night, and he had tried to find by what process this form of architecture had been arrived at. It prevailed everywhere, and it had reached even to their own land. Any one who cared about archaeology would know that the Venerable Bede, when in the North wrote clearly about buildings that were being erected about the year 780, and which were being built after he made his visit to Rome, which he described as being made "more Roman." He for one was very anxious to trace where the old Roman methods ended and what followed had arisen, and he paid a visit to Le Puy, of which a picture had been given, because their much-regretted member of the Council, Mr. Fergusson, had mentioned to him that there, perhaps, the missing link could be found. He confessed, however, that he was unable to follow that clue. Later on the work which had already been alluded to that night—the most valuable book of M. de Voglie, in conjunction with the French Ambassador, M. Waddington—gave him a better clue. There, he thought, they might make out what the processes were, and he considered it worth their while to follow it up. One of the advantages of the paper having been kept to the one phase of the Romanesque was that they kept clear of the pitting of one school of architecture against another. He hoped that they would remember that the ignorance of the general public as to this particular phase of architecture was absolute and, in this country, complete. No one knew anything about it. The British public was bound down with detail, and the paper read that night would be Greek to a large number of the British public, who cared little about technical construction. This, however, should no longer be the case, for these Romanesque churches had their effect. He had never met any one who had been to Durham or any of the great English churches of this period who did not come away saying there was something about them which it was impossible to describe. Surely it was worth their while to take some little trouble to know how the style was formed, and he, for one, was extremely grateful to the distinguished member who had given them the paper that night, because it really was a revelation.

Mr. R. Phénix Spiers, in seconding the motion, said it would be impossible now to follow Mr. Bond into the arguments he had laid down and which must have taken an immense amount of time to elaborate. He happened to have visited nearly all of the places he had mentioned, and his only regret was that he had not had that excellent paper with him when he visited them. At the same time it did happen that on his visit he took interest in the method of arched vaults, and the photographs they had seen reminded him of the buildings he visited many years ago. On the present occasion he thought he would be doing a greater service to the Institute and Mr. Bond if he limited himself to one or two additional examples which it might be interesting for him to take up, because he did hope that the subject would be pursued. Mr. Bond had given them

what could only, in the time, be the skeleton of his theory, and it was one on which many volumes might be written. He hoped Mr. Bond would continue the subject, because he was quite certain that it was one of the greatest possible advantage to them. With that view he would mention one or two buildings somewhat earlier and somewhat later than those given by Mr. Bond. Mr. Bond had been rather timid sometimes with regard to the date of the church he had shown of Périgueux. As a matter of fact, there was an earlier church in the vicinity of Périgueux—St. Astier, the date of which was 1010—and that was the first church he knew of which was covered with a dome on pendentives. The pendentives of the dome were gone, but the piers which sustained them were still there. This was the same as at St. Etienne, Périgueux. It was rather singular in this church and in St. Astier—and it may be found in other examples—that, instead of beginning, as had always been the custom, with the choir, they seemed to have begun at the other end. They had another instance of that in the case of Angoulême for the earlier period, 1117 to 1120. The east dome was probably the first portion erected, and the others added afterwards; and, as regarded St. Etienne, it was certain that two domes were erected and a third may have been erected and pulled down. As regarded the Church of St. Front, probably the church was begun much later than 1120. It seemed an additional proof to him that, after the basilican church of St. Front was burned down, there was an attempt to copy St. Etienne, for in the middle of the nave they built four great piers to support a dome. He presumed that some one saw St. Mark's, and then they commenced the building they knew well before its restoration. The problem of St. Hilaire, Poitiers, which was one of the most wonderful interiors he knew of, might be solved in this way. There were portions of it earlier than the nave portion. Certainly the aisles were older and portions of the transept. They wanted to vault the nave, but it was 50 ft. wide, and that was more than they dared at that time, so what they did was to build within the existing nave, piers at certain intervals and construct domes in each bay. But that was a theory which might be worked out later on. It was one of great interest, and he thought its suggestiveness for the treatment of modern churches was wonderful. Although Mr. Fergusson was not a practising architect, it was astonishing how closely he arrived at results, and he (the speaker) thought his idea was a valuable one when he pointed out that the object of the pointed barrel vault was to have less filling in at the top because it was the custom to cover over this barrel with a roof. For that reason the pointed barrel vault actually existed before the circular barrel vault. As regarded the Church at Tornour, it was a wonderful building, and he did not know why it had not been copied. The light they got was splendid and he was astonished that the type had never been reproduced, as he thought it extremely fine. Mr. Bond had stated that the consecration took place in 1019. The church was begun in 1007, after the fire, and the consecration took place in 1010, but the choir was of the twelfth century. The crypt was of the old church of the tenth century, and still existed. Mr. Bond had instanced two cases in which transverse vaults were run across the aisles, and he might add St. Remi, Rheims, and the basilican church of St. Front. As regarded the Church of Grandson, in Switzerland, which was put down as being of the tenth or eleventh century, its appearance was deceptive, and Mr. Street considered it to be twelfth century, a date also quoted by Reber. With regard to the test of plan, St. Sulpice, a small church in Switzerland, was certainly very early—only three apses and the transept remained. At Vignory there had been some change as regarded the east end, and it had been vaulted. It was vaulted with barrel vaults originally, and was one of the earliest instances of vaults carried round on apse. The two bays now built into the base of the tower of St. Front were identically the same as at Vignory, and the two vaults may have been built by the same masons. Architects, no doubt, in those days went about and brought in views of their own country, and it was natural that there should be later changes brought into buildings. He thanked Mr. Bond for the enormous research he had shown on the subject and the admirable way in which he had illustrated it.

The motion having been heartily carried,

Mr. Bond said he was extremely obliged for the hearty vote of thanks.

The Victoria Monument.

The Chairman announced that a special general meeting had been summoned by the Council in compliance with a requisition by twelve subscribing members, to be held next Monday, to consider the various resolutions regarding the proposed national memorial to Queen Victoria.

The meeting then terminated.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The eleventh meeting of the session was held on the 17th inst., Dr. W. de Gray Birch, Vice-President, in the chair. Mr. Charles E. Keyser gave a very interesting exhibition of photographic lantern-slides illustrating the Norman tympana of English church doorways. There were over 170 slides, besides a large number of bromide enlargements arranged in series on the walls of the room. Mr. Keyser explained that he did not intend to give a lecture or to read a paper, but simply to offer a few views in explanation of the subject of each view as it was shown, with the name of the church to which it belonged. The exhibition had been given before several other societies, and the collection of photographs—which is being continually added to—is certainly a magnificent one and, of its kind, unique. A paper was contributed by Mr. T. Cam Hughes upon some recent discoveries at Bleasdale, Lancashire. These discoveries consist of a group of pre-historic remains occupying a prominent position on a knoll of boulders in the midst of an amphitheatre of moorland hills due west of Fairsnape Farm. Mr. Shadrack Jackson, with the help of Mr. Kelsall, the occupier of the farm, made a series of excavations in what he suspected to be an early British burial-place. Two circles of timber were met with, the outer being 150 ft. in diameter, composed of round logs of oak placed closely side by side, five in a row, forming a kind of platform. The inner circle is much more complex and is 75 ft. in diameter. In the centre of the circle was found a rectangular hole which had been filled with wood ashes, and in the hole a group of three cinerary urns was discovered. Two of the urns contained calcined human bones. A small cup was also found in the mouth of one of the urns in an inverted position. The features of this remarkable discovery are all characteristic of the Bronze Age, and we shall await with the greatest interest a more full account, which, we understand, is to appear in due course.—Mr. Patrick, Hon. Secretary, announced that the Congress would be held at Newcastle-on-Tyne, from Thursday, July 18, to Wednesday, July 24, both days inclusive, under the presidency of Mr. Thomas Hodgkin, M.A., D.C.L., F.S.A., of Barmoor Castle, Beal, Northumberland.

BOOKS RECEIVED.

GUIDE TO THE SEARCH DEPARTMENT OF THE PATENT OFFICE LIBRARY. (The Patent Office, 6d.)

INVESTMENTS IN HOUSES AND LANDS. By R. Denny Orill. (Eltingham Wilson, 1s.)

SANITARY ENGINEERING: A PRACTICAL TREATISE. By Colonel E. C. S. Moore, R.E. Second edition, revised and enlarged. (B. T. Batsford.)

NEW TABLES FOR THE SOLUTION OF GANQUILLET AND KUTTER'S FORMULA. By Colonel E. C. S. Moore, R.E. (B. T. Batsford.)

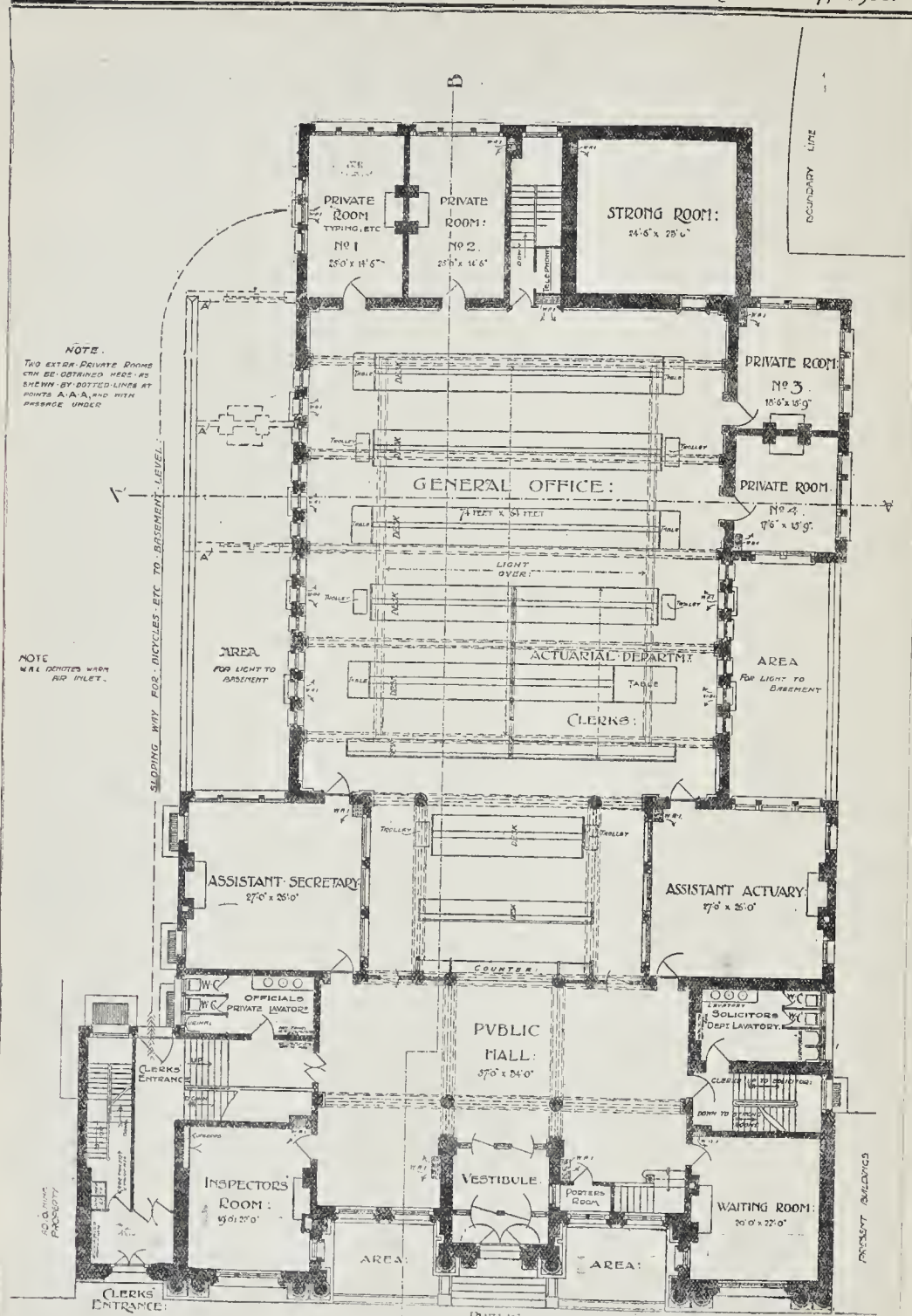
THE HOUSING OF THE WORKING CLASSES ACTS. By Chas. E. Allan and Francis J. Allen. Second edition. (Butterworth & Co.)

A HANDBOOK OF PRACTICAL GASFITTING. By Walter Gratton, F.C.S. (B. T. Batsford.)

THE WORKMEN'S COMPENSATION ACT, 1897: A PLEA FOR REVISION. By R. T. Thomson. (Eltingham Wilson.)

PROPOSED BATHS IN CHORLTON-ON-MEDLOCK.—The Baths Committee of the Manchester Corporation have adopted plans which have been prepared by the City Surveyor for the erection of new baths in High-street, Chorlton-on-Medlock, to be called the Victoria Baths. The building, which will include a variety of baths, in addition to plunge baths for both sexes, is estimated to cost 40,000.

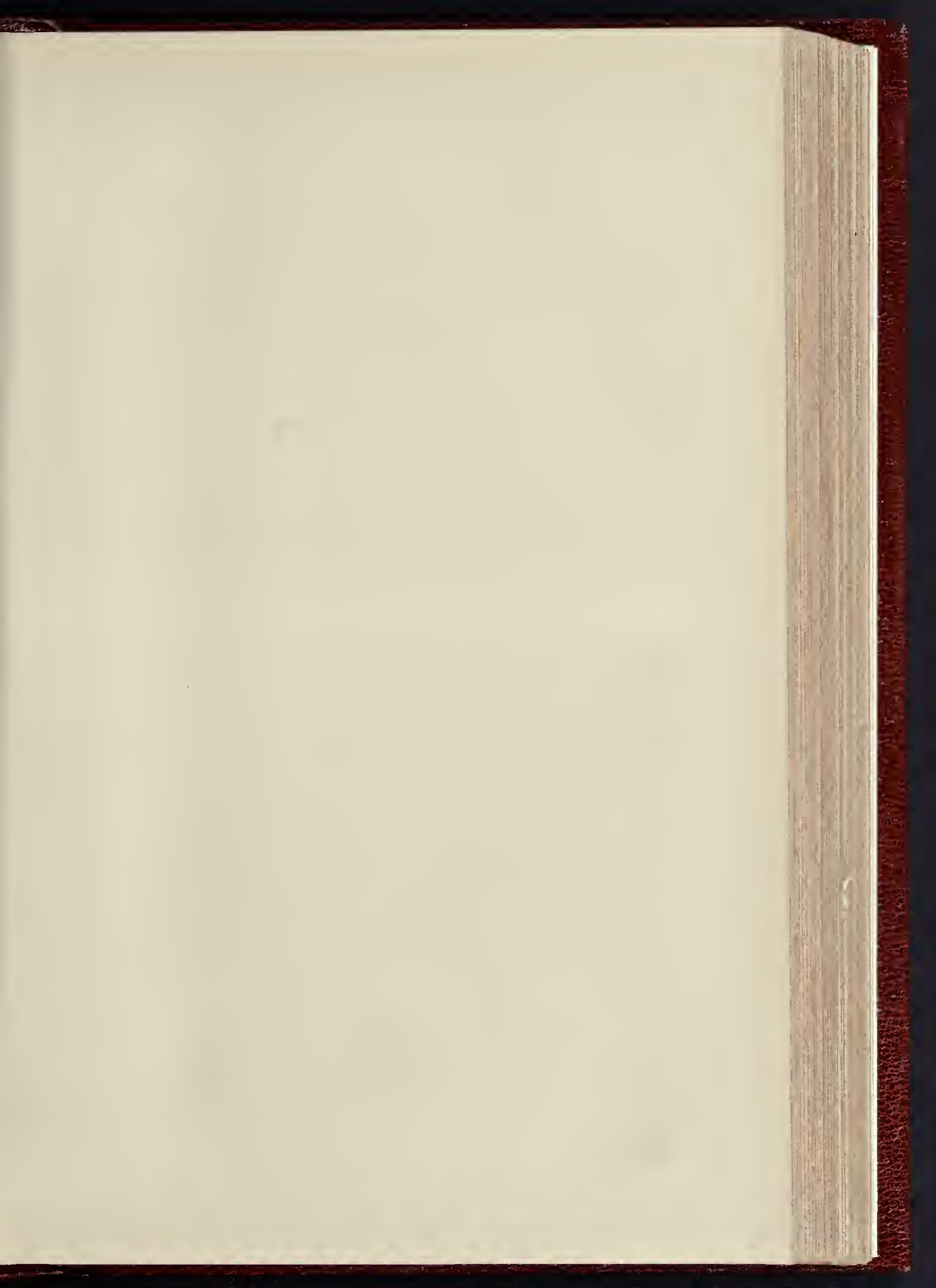
DRILL HALL, GOSPORT.—A drill hall is to be erected at Gosport from the designs of Lieutenant H. A. F. Smith, of Gosport. The building will be situated in Walpole-road, and will be three stories in height. The hall itself will be 80 ft. by 45 ft. The contractors are Messrs. Lane Eros, their contract being for 2,925/.



GROUND FLOOR PLAN:

Chas. Heston Architects, Manchester

Competition Design for Norwich Union Life Insurance Offices. Plan.

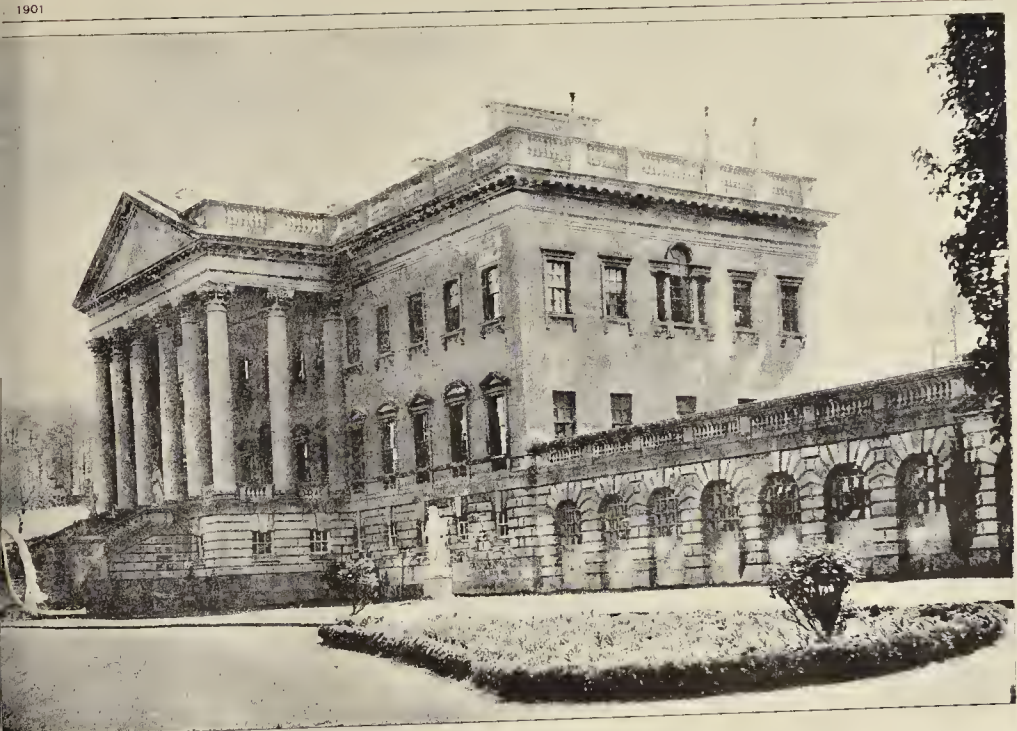




ENTRANCE FRONT.



PALLADIAN BRIDGE.

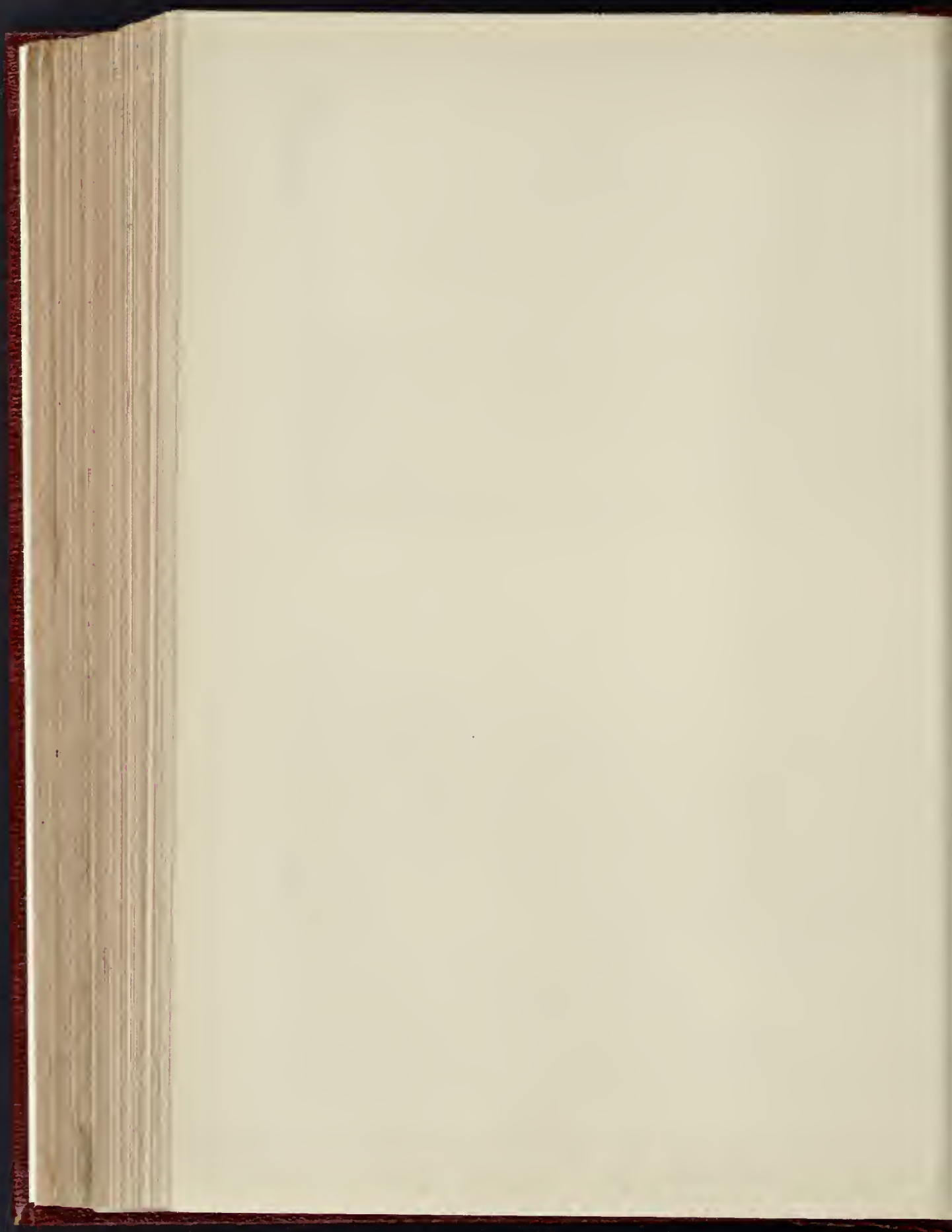


GARDEN FRONT.



THE GARDEN.

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



Illustrations.

DESIGN FOR NORWICH UNION LIFE INSURANCE OFFICES.

WE published a fortnight ago the selected design in the competition for these new offices at Norwich, which seems to have excited a good deal of interest, and called forth an amount of architectural ability unusual in the case of a competition for a private building.

We give this week the perspective view of the design submitted by Mr. Charles Heathcote, of Manchester, together with the plan for the ground floor.

PRIOR PARK, BATH.

THOUGH Prior Park has been the subject of a good many illustrations, these have been generally from pretty nearly one point of view, showing the garden front. A collection of four views gives a better all-round idea of a house which has acquired some celebrity both architecturally and otherwise, and the view in the garden shows that here also the element of staidness was not neglected.

Little did Colin Campbell, when he refused to use Bath stone in the erection of Greenwell Hospital, think of the results of his action; for Ralph Allen was the proprietor of large quarries, and if he could not induce them to use his stone, he would use it himself. He would build a mansion that should display not only the variety of uses of his stone but the grandeur of architecture. The site was one particularly calculated to set off any building that might be placed upon it. At the upper end of one of the many "combes" with which the neighbourhood abounded, with grassy slopes stretching away down to Old Widcombe House and church, was to lie the country house of Prior Park, the design of John Wood.

A word about the owner. Ralph Allen, whose name has come down to us associated with high principles of honour, loved to entertain at his home the cultured and learned men of the day. Although anxious to develop the natural resources of the neighbourhood, he was yet careful to show the greatest kindness to all whom he could befriend. Especially was this the case in regard to his workmen, for whom he erected dwellings on Combe Down. Among the great men who had tasted of his unsparring hospitality, were Pope, Fielding, Smollett, Warburton, and others. His natural abilities had brought him to this honoured position. Born in 1792, he had, after a good education, been a clerk in the Bath Post-office, and the story is often told of how he was fortunate enough to secure the attention of General Wade, who was then stationed in Bath, through the discovery of a plot for insurrection in the West of England. As a result he was made postmaster of Bath. In 1742 he was mayor, and in 1763, on his retirement from the Corporation, he gave the city 500*l.* towards the building of a new Guildhall.

It is not unlikely that in the first instance Wood had been found by Allen in Yorkshire and invited to come to Bath. In any case the two men were friendly for a period of some years, and no doubt Allen found that the advice which he received from Wood was such as tended to develop his schemes, while Wood, on the other hand, must have felt the advantage of working for such an influential patron.

Allen died in 1764, aged seventy-one years, and the estate descended to Bishop Warburton, who had married Allen's favourite niece, Miss Tucker. But he did not live much at the mansion, and the society fell away. After his death in 1779 the house came into the possession of Viscount Hawarden, whose wife was Mary, a daughter of Ralph Allen's brother. He died in 1803, and Thomas Ralph, second Viscount Hawarden, succeeded him. With the death of the latter, in 1807, the connexion of the Allen family with Prior Park ceased. In 1829 Bishop Baines bought the estate for 22,000*l.*, and it was for a time well cared for, although the interior of the house suffered considerably from a great fire which took place on May 30, 1836. After passing through other hands, it was in 1867 purchased by Bishop Clifford, and became a Roman Catholic college, which it has since remained. The real interest of the old work now lies in the central block and the building on the west of it.

M. A. G.

OLD ARCHITECTURE OF BATH.

THESF examples of the eighteenth-century architecture of Bath, taken from photographs, are given as illustrations to Mr. M. A. Green's paper on the subject read before the Architectural Association last week, and printed on another page.

SKETCHES AT WHITBY.

THE sketches which we reproduce were made at Whitby, a sketching-ground so well known, either by visit or reputation, that it is, perhaps, unnecessary to make any statement as to its suitability; but the town and neighbourhood abound with endless subjects for sketches of pictorial architecture and objects for study, in variety, perhaps, unequalled by any other town on the English coast. Until the year 1751 all the roads in the neighbourhood lay in a state of nature, rough, rugged, and uneven, and it was dangerous, especially in winter, for any one on horseback or by conveyance to come into the town. To this long-continued isolation may be attributed the primitive condition of the place and its inhabitants, a condition which, however, is in danger of disappearing owing to the increasing popularity of the town as a seaside resort.

The first object of interest on approaching the town is the well-known abbey crowning the East cliff, a ruin which, with the old church of St. Mary built on the same spur, dominates the surrounding country, and in conjunction with the old town and the river Esk flowing some 250 feet below, make a very striking composition. Of the old abbey all that now remains are the ruins of the church occupying the site of the old Saxon building, but exhibiting no traces of remains earlier than the twelfth century. The most ancient portion is the choir, which is Early English; the transept also is Early English, but of later date, and the nave is richly decorated. On the south side are foundations of cloisters and domestic buildings.

The town itself, with its quaint narrow streets and old-fashioned houses built in such picturesque confusion, also gives ample material for those fond of architectural sketching, and it is very interesting to wander in and out by the narrowest of passages and up and down by the steepest of stone stairs, the attention being constantly attracted by something worth sketching in the most out-of-the-way corners.

The river runs through the centre of the town, the two parts of which are connected by a bridge, apparently a combination of old and new work, its stone huttresses and wooden corbels giving it a very quaint appearance, somewhat spoll, however, by the iron draw-bridge in the central span. From this bridge some very effective sketches may be made, especially in the evening, when the town is bathed in the light of the setting sun, the outlines and colouring of the red-tiled cottages modified by the atmosphere, acquiring as the evening draws on that harmony and breadth of effect which is so restful and beautiful after a hot day. Leaving the bridge, and passing along the quay, where there are to be seen many objects of interest and "little bits" to be noted in the sketch-book, is the principal of the two piers which form the harbour entrance, a delightful spot for study or recreation. At the end of each pier is a lighthouse; the larger one, which has weathered to a beautiful colour, being exceptionally fine in proportion.

For change of scenery and study there are the moors and several picturesque villages within easy distance from the town, and Robin Hood's Bay is but seven miles by train, and although so frequently illustrated is none the less interesting and well worth a visit.

GEORGE W. COLLINS.

LOCAL AUTHORITIES' OFFICERS SUPERANNUATION BILL.—In reference to this Bill, a meeting of the surveyors to the Local Authorities in the Birmingham district was held on Thursday last week in Birmingham, when the question before them was the Bill now being promoted in Parliament, entitled the "Local Authorities' Officers Superannuation Bill." It was resolved: "That, this meeting of surveyors, being unanimously of opinion that the Local Authorities' Officers Superannuation Bill should be carried through Parliament this session, pledge themselves to do everything in their power to accomplish this end by interviewing the various Members of Parliament representing their several districts, and requesting their strong support thereto, and to also urge upon their Authorities to petition in favour of the Bill."

BUILDING TRADES EXHIBITION.

THE exhibits of bricks, tiles, terra-cotta, and similar clay goods are quite up to the standard of previous exhibitions. There is an increasing tendency to manufacture red terra-cotta, finials, ornamental bricks, and models of terrible-looking animals. Common bricks seem to have fallen into the background, and higher-class bricks, of the rubber and terra-cotta types, take their place at the exhibition to some extent. The increasing use of roofing tiles has brought forth several more or less original designs, whilst the perforated common tile is also present in great quantity. Chimney-pots, on the other hand, appear on the whole to be of a simpler character than usual, and many are executed in red terra-cotta. Rustic ware is well represented, and ornamental terra-cotta tablets with designs in high relief are conspicuous on some of the stands.

Messrs. S. & E. Collier, of Grovelands, Reading, have a large stand whereon are exhibited roofing and wall tiles, both machine and hand made; there are ornamental tiles in various patterns for vertical work, and small tiles for bays, porches, &c. There are many ornamental patterns of ridge tiles and finials. In regard to bricks, Messrs. Collier show smooth-faced air bricks, and common bricks both smooth and sand faced. These goods are for the most part made from clays, sands, and loams of the Reading period, and give a good idea of the wide range of utility of that formation.

Mr. Mark Gentry, of Sible Hedingham, Essex, also has a good exhibit of his "M.G." brand red facings, rubbers, arch bricks, and moulded and enriched bricks.

Messrs. Perrett Brothers, of Cheam, Surrey, have a well-furnished stand of red facing and moulded bricks, also rubbers, tiles, finials, chimney-pots, terra-cotta ware, vases, &c. The earthen employed in their manufacture are the clays and loams of the Reading series, which are well represented in the neighbourhood of Cheam; they take on a good red colour, of a uniform tint. This is a new venture, and we wish the undertaking success.

The Somerset Trading Company (late Messrs. Browne & Co.), of Bridgwater, have erected a small building which is covered with their patent interlocking tiles. It is claimed for them that they are easily laid, without nails, and as they are proof against rain and snow-drift, they are specially suitable for use in exposed positions. The same firm also exhibit interlocking double Roman tiles, square-shouldered to break the joint, Poole's tiles, Phillips' lockjaw tiles, triple and double Roman tiles, bricks, and terra-cotta.

Messrs. Candy & Co., Great Western Potteries and Brickworks, Heathfield, Newton Abbot, have a large stand exhibiting their bricks and stoneware of various kinds. The body of the ware is chiefly of a buff tint, but the goods are very largely glazed. The firm has published some interesting chemical analyses of the fireclay in the raw state and the brick made from the clay. The results are as follow:—

	Composition of the Fireclay.	Composition of the Fire Brick.
Silica	77.30 per cent.	82.90 per cent.
Alumina	16.60 "	14.11 "
Peroxide of iron....	1.90 "	2.39 "
Lime and magnesia	traces	traces
Potash (with some soda)	"	0.54 "
Loss	4.20 "	0.06 "
	100.00	100.00

The very small percentage of lime and the alkalis invests this material with special interest from a clay-working standpoint, for the raw clay is, practically, a pure silicate of alumina plus about two per cent. of iron. It is not surprising that bricks made from such clay should be capable of withstanding great compression. Six bricks tested for crushing strain, each about 3 in. by 9 in. by 4½ in., gave as a mean result 4452 tons per square foot; whilst tests as to porosity showed that some white glazed bricks absorbed from ¼ to ½ oz. of water during four hours. It would have been interesting had the precise method of experimenting been explained, as in absorption experiments that counts for much; and the effects of a more prolonged immersion than four hours might well be given. However, we are pleased to see that some attempt has been made to give the physical properties

of the bricks, for very few manufacturers go to the trouble and expense of doing so.

The Cattybrook Brick Company, of Bristol, have specimens of brickwork in different colours, red and buff terra-cotta and moulded bricks, with blue and brindle goods. The most conspicuous parts of the stand are in the buff terra-cotta, such as window-heads, mouldings, &c. The same firm also shows red facing bricks and vitreous blue bricks for stables. Experiments in regard to thrusting stress on six yellow pressed bricks, each about 2.65 in. by 8.75 in. by 4.20 in., show a mean stress per brick, cracked slightly at 286.6 tons per square foot cracked generally at 386.3 tons, and crushed at 393.7 tons per square foot. The results on six red bricks are—cracked slightly at 328.8 tons per square foot, cracked generally at 371.9 tons, and crushed at 381.2 tons per square foot. In all the experiments the bricks were bedded between pieces of pine 2 in. in thickness.

Messrs. H. J. & C. Major, of Bridgwater, have erected a hut whereon are displayed their patent roofing tiles, of Roman and other patterns; also Major's patent interlocking plain tiles of Brosley type, requiring neither nails nor mortar to make a good roof. There are also specimens of milklin and ornamental ridge tiles, bricks, &c., chiefly in red goods, but there are some good white perforated bricks.

Messrs. Stanley Bros., of Nuneaton, exhibit a variety of their goods, including white and coloured enamelled bricks, improved salt and grey granite bricks, red and buff chimney pots, ornamental red and buff terra-cotta, semi-ercaustic paving tiles, blue pressed bricks, garden tiles, red and buff terra-cotta and glazed vases, and Staffordshire quarries.

The Glenfield Premier Brick and Terra-Cotta Company, of Glenfield, near Leicester, show their best red, hand-pressed facing brick, tapped wire-cut for seconds facing, moulded and ornamental bricks, terra-cotta chimney-pots and ridge tiles and finials, all red goods.

Messrs. G. Tucker & Son, of Loughborough, exhibit their red and buff terra-cotta, red pressed facing bricks, red sand stocks, special sewer bricks, and roofing and paving tiles. The colour is good, and the different specimens seem to have been carefully burned.

Mr. Charles Watson, of Napton-on-the-Hill, Warwickshire, also shows some samples of bricks, roofing tiles, and quarries made from the well-known lias clays of the neighbourhood.

Messrs. Joseph Place & Sons, of Darwen, have a large exhibit of salt glazed bricks, enamelled bricks (white and coloured), chimney-tops, &c. An analysis of the fireclay employed gave the following results:—

Silica	47.20	per cent.
Alumina	35.70	"
Oxide of iron	2.07	"
Lime .....	.29	"
Magnesia .....	.36	"
Potash and soda .....	.98	"
Combined water and organic matter.....	13.15	"
	99.84	

The sample was dried at 212 deg. Fahr., and the analysis shows that the clay is an excellent material for the manufacture of fire bricks and lumps. The proportion of silica is somewhat lower, and of alumina higher than in most fire clays, which is in its favour as a refractory material. The fire bricks are made from the Lower Mountain Mine clay of Lancashire makers. Place's patent chequer bricks for kiln bottoms are also shown on the stand.

Mr. George Swift, of Liverpool, shows some plain and embossed enamelled tiles, mosaics and architectural faience for internal and external decorations, also some patent dovetailed security back tiles.

Messrs. Oates & Green, of Halifax, exhibit a number of salt glazed, white and coloured glazed bricks, as well as many examples of their sanitary goods. In the Smoke Abatement section the firm shows the application of certain of their bricks in connexion with the "Berceford" fire.

In the last-mentioned section the Flaming Fire Brick Company, of Mark-lane, have an exhibit. They claim that their process produces a smokeless fire by enabling coke, anthracite, or cinders to burn brightly in any open grate or closed range, with less trouble and less expense than ordinary coal or gas, yet without any structural alteration of the grate being necessary. These perforated bricks be-

come much more quickly and intensely heated than ordinary solid fire-bricks do. The use of anthracite must, of course, be beneficial from a smoke abatement point of view, and the bricks certainly appear to do what is claimed for them.

Stones are not well represented in the exhibition, and there are very few building stones. Mr. John Rooke, of Weldon, near Kettering, has a small stand of the cream-coloured oolitic limestone, known as Weldon stone. Messrs. Harwood & Young, of East Grinstead, exhibit some specimens of yellow sandstone from the Hackenden quarries. This stone comes from the Hastings division of the Wealden formation. Mr. S. T. Clothier, of Street, Somerset, has some blocks of blue Lias Keinton stone, including slabs and kerbs. The Crown Dale Stone Company exhibit their silicious limestone in the form of ashlar mouldings, carvings, &c. In the gallery there are a few good stone exhibits, principally illustrating the use of the material for surveyors' purposes. We noticed the stands of the Pwllheli Granite Co., whose specialities are granite setts, channels, kerbs, and macadam; the Hard York Nonslip Stone Co., Halifax, which firm has laid down a pavement to show the applications of the stone; Mr. James Runnalls, of Penlee, Penzance, exhibits specimens of Penlee stone; the Newry Granite Co., of Newry, Ireland, shows some setts and other uses of the stone; Messrs. John Wainwright & Co., of Shepton Mallet, have some basalt road metal, and samples of carboniferous limestone; the Mountsorrel Granite Company, of Loughborough, near Leicester, show the employment of their well-known stone for street purposes; Messrs. Field & Mackay exhibit Cleve Hill basalt road metal and kerbs from the Titterstone quarry; Messrs. Mackay & Davies, of Pontypridd, have some specimens of blue Pennant paving stone; Messrs. Darbishes exhibit their well-known Penmaenmawr stone, from North Wales; the Hopton Wood Stone Company, of Wirksworth, Derbyshire, have blocks of their carboniferous limestone for building, &c.; there is also a good display of Norwegian granites, opicalcites, and marbles.

Of artificial stones, the Patent Indurated Stone Company* have, in addition to their ordinary products, a red window bay, also a staircase made of broken Leicestershire granite mixed with Portland cement; Messrs. B. Ward & Co. have some samples of artificial stone dressings, stair-treads, and mosaic work; and in the gallery the Victoria Stone Company have a good exhibit of their ordinary materials.

Cements are hardly represented, but in the entrance-hall we observed an apparatus, known as the Patent Standard Flourimeter, invented by Mr. W. F. Goreham, of Belvedere, Kent, which by an ingenious adaptation of a specific gravity process separates the flour of the cement from the grosser particles; this instrument must prove of great value to large users of cement and others.

Messrs. John Knowles & Co., in addition to a goodly display of sanitary pipes and similar ware, have some blue quarries and firebricks, blue cornice bricks, white terra-cotta, brown salt-glazed ware, and the like. In connexion we also noticed Callender's bitumen damp-proof course, which has been largely utilised in recent years, especially in the construction of reservoirs, water-tanks, &c.

Messrs. Peter Wood, of West Bromwich, have an interesting stand whereon are exhibited a goodly assortment of their annealed blue bricks, including pressed facings, bull-noses, plinths, splays, stables, and pavings; also channels, platform, and wall-coping, of various kinds, kerbs, large step bricks, window-heads, &c. A chemical analysis of the clay employed is given as follows:—

Insoluble residue (quartz and felspar)	33.58	p.c.
Combined silica	27.33	"
Alumina	16.73	"
Ferric oxide	6.57	"
Ferrous oxide	3.38	"
Manganous oxide	0.34	"
Lime	0.39	"
Magnesia	0.86	"
Potash	0.75	"
Soda	1.06	"
Combined water, loss, &c.	9.21	"
	100.00	

This analysis shows that the clay is a very good one for clayworking purposes, and

* Where no locality is given, the exhibitors are London firms.

judging from the finished products on the stand, vitrification is easily arrived at. One of the types of bricks made by the firm is styled the "imperishable blue," which is said to be non-corrosive.

Mr. F. H. Brook has a composite exhibit made up of the produce of various firms. Messrs. John Carr & Sons, of North Shields, show some well-glazed bricks in different tints, as well as sanitary ware; the Lumley Brick Company, of Fence Houses, co. Durham, have some white and coloured glazed bricks; the Sussex Brick Company, of Warnham, near Horsham, exhibit machine-pressed common bricks, re-pressed red facing bricks, sewer bricks, and hand-made red bricks; Mr. William Moberley, of Woodseton, near Dudley, has some Stourbridge fire-bricks, lumps, and fire-tiles; and the Midland Stone Pipe Company have sent some buff terra-cotta chimney-pots, salt glazed bricks, and some sanitary ware. Altogether the combined exhibit is an effective one, if there is not much of novelty in it.

Messrs. Broad & Co. have a large exhibit of sanitary goods, as well as white and coloured glazed bricks, building bricks, glazed tiles, hearth tiles, and majolica tiles in various colours and patterns, for wall work.

Messrs. James Woodward, of Swadincote, near Burton-on-Trent, show various types of sanitary goods turned out by the firm, also buff terra-cotta chimney-pots, flower vases, white and coloured glazed bricks, fire-bricks, &c.

The Sneyd Collieries, of Burslem, have a small exhibit in the entrance hall of their bricks, glazed white, yellow, green, and other colours.

The Newellite Glass Tile Company, already mentioned in our former article, show their patent glass tiles, which have a special key or backing of a bituminous nature, enabling them to be readily fixed in position, and which also prevent cracking of the opal glass by the alternate expansion and contraction due to rapid changes in temperature.

The British Opal Wall Glazing Company also have a neat exhibit. Their tiles differ from those last mentioned, amongst other things, in that the backing is composed of little rough knobs of glass projecting from the back of the tile, to give it a hold to the cement or other substance in which it may be embedded. The tiles are usually set in adamant cement, and the firm makes its own glass. To show the use of the material from a decorative standpoint there are exhibited some Japanese and floral hand-painted panels on opal glass. The normal effect of the opal glass as a wall glaze is exemplified by an erection in the centre of the exhibit.

Messrs. Mintons have a display of wall tiles representing the general scope of their recent methods of wall decoration, including bird panels with raised outline, and painted in coloured glazes; another panel shows figures in slight relief; a third panel of fish; and a fourth pheasants and partridges.

The Artistic Tile Company exhibit some new designs in hand-painted and other wall tiles, also a large assortment of flooring tiles, marble mosaics, &c. The white terra-cotta shown is a pleasing material, and is employed both for interior and exterior purposes.

Messrs. Colthurst, Symons, & Co., of Bridgwater, have erected a hut, tiled and finished by their red tiles, and many other patterns made by the firm are shown.

There is much to interest in the sanitary exhibits, and great and general advance is being made on all sides, which is quite a revolution on appliances in vogue twenty years ago. In examining the several groups, it will probably be noted how the minds of manufacturers have been directed to meet what are the needs of the day, and it is interesting to note the similar results which have been arrived at. Mr. George Jennings has a fine exhibit of water-closet appliances of every imaginable kind, from the new arm-chair pattern water-closet for Windsor Castle to the ingenious arrangement for water-closets for steamship above or below the water-mark; and a very clever and very complete portable water-closet is also shown. Part of the exhibit from the Paris Exhibition is here on view. Messrs. Cliff's manufactures are too well known to require description and are fully shown, among which is a decorative item that may be referred to—viz., Lethaby's rough surface bricks. This is a glazed enamel of beautiful and varied colourings, and intended for building up mantelpieces; its use suggests many combinations. Messrs. Shanks & Co. have an excellent show of baths, siphonic and

other closets. Among these the new Aqua jet-flushing cistern will certainly attract attention. This clever invention entirely does away with the pulling of a chain to discharge the siphon. The chain, so constantly a cause of trouble, and at times, ineffective, is discarded. The Aqua jet-flushing cistern is pneumatic in action; an indiarubber ball, which can be replaced at small cost, is enclosed in a porcelain case held by screws. Switching a lever discharges a column of water which impinges on the siphon and effects the discharge.

One of the best sanitary exhibits is that of Mr. Walter E. Mason, of Horwich, the whole of which is of his own manufacture. Among the water-closets may be noted the "Maelstrom," siphonic in action and very powerful in flush. We saw quite 10 ft. of a ribbon of paper carried away by this apparatus. Another noticeable feature was a urinal with a patent flushing nozzle, doing away with the intermittent sparge discharge. The flush was one of the most effective we have seen. An excellent mixing tap for baths was also shown. Others, equally good, are exhibited by Messrs. Jennings and Shanks respectively.

Messrs. Oates & Green, Halifax, show a hospital closet above the floor, and not of the corbel pattern, being fixed upon iron brackets into the wall, the advantage claimed being that it may be removed for repair if necessary. An ingenious arrangement is also shown for school lavatories to meet the objection of children using the same water for washing purposes; and to prevent the conveyance of ophthalmia a supply is provided with a rose instead of a sparge pipe, and the supply can be either intermittent or a continuous flow from the valves, being turned on or off by the caretaker for a fixed period or manipulated by the child using same. The salt glaze work exhibited is excellent in quality.

A novelty in lavatories is the "Runwell," (Messrs. Mason), which obviates all the objections generally attendant upon such basins, and is distinguished by the absence of plug, chain, and lead trap, and is siphonic in action; it cannot overflow and is automatic, and very quick in action. The waste is easily accessible, and there seems to be nothing to get out of order.

In the gallery, and coming under the sanitary survey, is a somewhat novel and remarkable machine, Ravenor's patent drain tester, by means of which defects are indicated upon a water-gauge for low pressure, or a gauge-dial indicating the pounds pressure. Testing for high pressure, the procedure is the same for vertical as horizontal pipes; stop outlets connect with drain, and work the bellows. This creates a pressure on the water in an annular channel, and causes same to rise in a gauge-glass; if this column of water be maintained the drain is sound, but if the water falls the drain is defective. The next operation is to detect the leakage; a cap is removed and a smoke rocket introduced, and the powerful bellows again used. The machine also provides a test for high pressure. When the bellows are worked the pressure is indicated on a pressure gauge; if the dial pointer maintains its position the drain is sound, but if it falls towards zero the drain is defective. Some idea of the power may be gathered from the fact that the bellows will give a pressure of 4 lbs., equal to a column of water 8 ft. high. A higher pressure can be obtained by attaching a bicycle inflator to a special valve provided, but 8 lbs., equal to a column of water 16 ft. high, should be the maximum. The machine is quite portable, is made of brass, and costing but 5l. 5s., is within the reach of all. We consider it to be an effective and very useful invention, and architects would do well to insert the test by this machine in their specifications.

Mr. Fewster Wilkinson exhibits what he calls a new system of stairs. We greatly doubt if there is anything new in the idea, which is the principle of two risers to one tread, not uncommon in mediæval buildings. The sample shown is "designed to afford the cottager as easy a means of getting upstairs as his richer neighbour enjoys." If he has no children this may be desirable, but if he should in addition be given to excessive drinking, neither his life nor those of his children will be worth many years' purchase. The stairs are designed to combine easier risers with wider treads than can be arranged on the ordinary system. For instance, at an angle of 45 deg. the risers and treads can be in the following proportions, 5½ in. by 11 in.

or 6 in. by 12 in. or 7 in. by 14 in., instead of equal risers and treads, as in the ordinary system. At lesser angles easier risers and wider treads can be provided. The stair exhibited is at the angle of 50 deg.; there are eleven risers for a rise of 5 ft. ½ in., each riser being only 5½ in. high. The treads are 9½ in. wide. The "going" is only 3 ft. 10½ in. However, we think the system may be very usefully employed in positions where access is difficult to be obtained, but it is a questionable advantage for the cottager.

A very useful plunger is exhibited by Mr. Cooper, Finsbury Park. It is used for cleaning closet traps, drains, soil pipes, baths, sinks, stackpipes, &c., by suction. It is easily applied to water-closets and basins, and after ventilation pipes and overflow waste pipes have been stopped up any obstruction in the trap can readily be removed.

Sash and casement windows appear to still afford suggestion for variation and combination; climatic conditions, however, render it impossible to adopt continental systems here, and while reversible and other fittings are introduced to mitigate what are supposed to be evils in the older forms of English windows, which are both familiar to us in appearance and use, there is, however, generally an absence of charm in modern windows as compared with those of a century or so ago. Reference may be made to some ingenious arrangement shown, as, for instance, Carey's patent sashes, which are a clever combination of both sash and casement, in which the advantages of both are procured. The sample shown has the appearance of an ordinary double hung sash, by releasing a long flat bolt under the meeting rail and two smaller ones at the sill level, the whole is converted into four hung casements, which open inwards. The whole seemed to work freely enough in the example illustrated. The casements or sashes are hung on bolts, kept in place by other bolts at sill level, and are provided with water hollows against the side of the sash boxes. The sashes slide on iron or brass slips screwed to the beading and inserted into the sash.

The meeting of the sashes is unprotected by water-hollows, and would probably share the defect of all casements in not being so weather proof as the time-honoured sash. The advantages are, however, the absence of friction on the reversible joints of other systems, the possibility of cleaning the windows from within, and the opening of the whole area; the slides are of brass or iron, the latter painted which would show wear.

Another variation in window fittings is demonstrated in the exhibit of the Moore's Patents Company, when the sashes are at the bottom, by application of a handle the sashes turn inward. The opening side of the sash-box is solid and the weights are on one side only. This has elements of economy. The hinge side, however, presents at the level of the meeting rail an ugly cut, the advantage again being the sashes are not cut by a joint. The patent casement is even better. By moving a catch the outside will turn inside for cleaning, which seems paradoxical, but it works in a groove and, like all clever things, is very simple. In Moore's patent two-way door springs and hinges there is nothing to get out of order. They are screwed on the floor, are ball bearings, and by an ingenious arrangement will remain open without swinging back and without attachment.

An excellent one-way door spring is also shown, in which the spring on a wheel comes down a decline and gathers impetus thereby. Both these springs are quite inexpensive, and should demand a large sale. Another good exhibit is the New Idea Double Action Spring Hinge. It is an American invention. The spring—a spiral—is mortised into the door and fixed with screws; it can be tightened up without removing the fitting. We found this hinge to work quickly and efficiently, and will be of especial value when spring hinges are required over girders, its merits being simple in construction, inexpensive in cost.

A useful material is provided in Solignum (wood saver), a preservative for wood, stone, and brickwork. In appearance it is not unlike some qualities of tar. While being a preservative and soaking into the material, destroying all germ life, it at the same time possesses very pleasing qualities of colour and texture, shows the grain, and is capable of polish, although we prefer its pleasant flat appearance. It is produced in several gradations of

brown colour, and is most suitable for fences and half-timberings.

Among the most direct artistic exhibits must be mentioned the small but most interesting collection shown by the Terra Cotta Home Arts, Compton, Surrey (Mr. G. E. Watts). These consist of red terra-cotta sundials, garden vases, and other delightful works. In a stall adjoining the latter is also an interesting collection of decorative pottery. The Della Robbia Pottery Company, with which Mr. Harold Rathbone, of Birkenhead, is associated, have a small and representative stall.

Messrs. Carter & Co., of Poole, have an excellent collection of lustre tiles of all kinds. We were much struck with their richness. A raised tile with a Medusa head is shown which, in conjunction with others, is suggestive of successful fireplace treatment.

The Conduit and Insulation Company* have an exhibit of steel-armoured insulating conduit for electric wiring which will repay study. In their system of wiring the electric cables are not only completely protected from mechanical injury, as the steel conduit is nail-proof, but leakage of current is prevented by an insulating material which prevents the covering of the cable ever coming into contact with the metallic tube. When buildings get their electric supply from the mains of a public company, then it is notorious that in many cases the electric pressure between one of the mains and the steel conduit is greater than the pressure between the mains; hence in these cases it is imperative that when steel conduit is used it should be insulated. The method of making joints, and the useful patterns of joint boxes, switches, and fuses exhibited, show that this Company has perfected a very substantial and, from the wealthy consumer's point of view, a most desirable system of wiring for the electric light.

To electricians the exhibit in miniature of earthenware tubes for electric cables by Eredi Frazzi, of Cremona, Italy, for whose firm Mr. Arthur Brown is the sole representative in this country, will prove most interesting. The advantages of earthenware tubes for use with underground mains are well known to English electricians, and Messrs. Doullon have supplied them for many electrical undertakings. The advantages claimed for the Frazzi tubes are the great strength of the material used and its excellent insulating properties. The conduits are of two kinds. In the first kind it is formed of two distinct parts, the rectangular trough and the earthenware capping. If several cables are put in the trough leakage may take place between them, although they are well insulated from earth. Owing to the difficulties of getting a perfect fit for the cap for long lengths, the pieces are only about 2 ft. long. We were more interested in the second kind of conduit, which will be useful for many electrical purposes. In this case each cable has a separate compartment for itself, and the lengths are all in one piece. These conduits are excellently adapted for polyphase working, which is now the standard system in Italy.

On Tuesday afternoon Sir John Taylor, of H.M. Office of Works, and Mr. Edwin O. Sachs, architect to the Royal Italian Opera House, entertained on behalf of the Council and Executive of the Fire Prevention Committee some 600 members and visitors to view the special Fire Prevention exhibit which has been organised under the auspices of the Society. Sir John Taylor addressed the members and visitors, dealing exhaustively with the necessity of popularising the subject of fire protection, and he thanked the exhibitors for the spirited way in which they had co-operated, not only in their own interest, but with a view to putting before the public the scientific aspect of fire protection.

Mr. Edwin O. Sachs thereupon addressed the members and visitors as to the advisability of making the Exhibition a permanent one, similar to the permanent Sanitary Exhibition organised under the auspices of the Sanitary Institute.

The last Spring visit of the Architectural Association was also made to the Exhibition, on Saturday last, when the members found a good deal to interest them, especially the different forms of plaster partitions and forms of adapting the most recent developments of slabbed plaster to modern requirements. The general verdict was that this year's was one of the best that had been held.

Correspondence.

To the Editor of THE BUILDER.

THE SPECIAL MEETING AT THE INSTITUTE.

SIR,—Whatever individual opinions may be as to the limited architectural competition for the National Memorial—or, indeed, upon the whole question—the Institute meeting called for Monday next is most unfortunate; and it is to be hoped that the majority of those who attend will make a point of preventing any outcome from it, for the following reasons:—

1. Any recommendation made to the Memorial Committee should emanate in a dignified manner from the Council, not from a general meeting forced on by the action of a few members.
2. The member who has been chiefly instrumental in calling the meeting, is not one with whose procedure the general body of the Institute should desire to associate themselves.
3. The position is illogical, the President of the Institute being himself a member of the Memorial Committee.
4. It is far from likely that the recommendations made will be attended to, as the President, in his capacity of member of the Memorial Committee, will know exactly the value of this demonstration, and the Institute—should the meeting adopt the resolutions—will merely sanction a procedure leading to no result—and with loss of dignity.

F. R. I. B. A.

THE QUEEN VICTORIA MEMORIAL.

SIR,—It would appear, from the large number of letters appearing almost daily in the Press, and from the reports of meetings, that the disappointment at the very limited competition for this work is very widespread, and that there is a strong wish, if not a faint hope, that the committee may be induced to change their minds and open the competition to all artists of the British Empire.

Two mistakes seem to have been made, firstly, hasty decision before, at any rate, sounding the public; secondly, the assumption that a competition for a work of this kind is on all fours with a competition for a great public building.

It is more than likely that the advice of the authorities at H. M. Office of Works, as experts on the subject, was sought and followed. But in selecting architects for great public buildings artistic qualities are not the only essentials, for there must be present also great practical knowledge, wide experience, and business capacity. Here, however, before all things, we want art, and without presuming to say a word against the selected architects as artists, one feels compelled to exclaim that "There are others."

It is not only in the upper ranks of the architectural profession that there is at the present time a great amount of ability, but I believe that there is also a most exceptional amount of young talent only waiting an occasion to show itself. An open competition for this work would be a splendid opportunity—and when will there be such another, bringing such equal opportunities to the experienced and inexperienced? I feel sure that the results would be both a revelation and an education to the public; and judging by the large number of amateur suggestions, it is evident that there is a great amount of public interest taken in the subject.

But for an open competition there should be plenty of time, in order to put the small man more on a level with the great. The small man wants more time to work out his scheme than the great man, with an office full of assistants; and the great man would also be able to give more of his personal attention than he could do if he had to snatch short intervals in the midst of his large business.

If there is plenty of time there will be plenty of designs, and there will be more money also. Let the exhibition of designs be NEXT SPRING, and allow every one to illustrate his ideas in his own way, fixing a limit of size only. If the competition is open the public will take more interest in the scheme and more money will come in.

It was a surprise to many of us to learn that there is only one sculptor worthy of mention. Surely there are others.

F. B. WADE.

SIR,—I think most architects and others will agree with the remarks in the recent leading article you published, that there should be an open competition for this work; it might be for the memorial only, never mind about the avenue in front of it. It should consist of sketches only, and five artists from the competitors should be selected, and these should be added to the five architects already chosen. This, I venture to think, would satisfy the desire of many who would like to submit a design, and also would admit the already selected architects without their being subject to an open competition.

L. DE VILLE.

SITUATIONS VACANT :

SUGGESTIONS TO APPLICANTS.

SIR,—Replying to advertisements of situations vacant, by young men and old, is no doubt a necessary evil, but something might easily be done to improve matters, both in the interests of employers and employed.

In recently reading through some sixty or more applications with the accompanying testimonials, I confess to being greatly surprised that the young workers in our profession should send out manuscripts with so many defects. There were exceptions, of course, but I refer to the general rule.

Granted that the applicant considers himself suitable for the berth advertised, the first essential for a good application is good thinking, for an employer wants replies in a consecutive business-like way, and this can only be done after carefully thinking out what should be put into writing. A well-known writer says "The chief labour in writing is thinking." Let the applicant first jot down in regular order what seem the important points, carefully including any matter referred to by the employer in his advertisement and excluding the unimportant and trivial. Do not duplicate statements; cut out unnecessary words and phrases, remembering that the person who is to read the letter is very possibly a busy man. Applicants should study how to express themselves with the greatest force and grace, but, above all, seeking clearness and truth of expression.

It cannot be too plainly pointed out that failure must necessarily follow the loose ways of many who take no thought, but evidently pick up pen and proceed to put on paper such things as may chance to come into their minds during the process of writing.

Successful writing means thought.

G. A. HUMPHREYS.

ELTHAM PALACE.

SIR,—The present is a favourable opportunity for students to measure the ancient roof of the hall and the hall itself, as Messrs. Shillitoe & Son, of Bury St. Edmunds, are engaged in "strengthening" the roof. There are ladders and platforms put up. No doubt facilities would be given to students.

THOMAS BATTERBURY, F. R. I. B. A.

LONDON BRIDGE.

SIR,—Would you kindly, or possibly some of your numerous readers may be able to, enlighten us as to the probable fate of London Bridge? One of the daily papers informs us "that the Bill for the widening came before a Select Committee of the House of Commons on March 29 last. It was unopposed, and the preamble was passed and ordered to be reported to the House for third reading."

If the widening is to be effected by some overhanging arrangements without increasing the width of the foundations and the masonry from the base upwards, a permanent injury and weakening of the structure must result.

If the state of the foundations is such that they must not be interfered with, by all means leave the bridge alone.

I fear it will be too late to protest when the Bill has passed the third reading.

J. STANNAH.

VICTORIAN MEMORIAL, SCARBOROUGH.—A meeting of the committee appointed to deal with the proposed memorial to the late Queen Victoria at Scarborough was held on the 18th inst. Various schemes were submitted—namely, a Victorian Memorial Institute, including reading-room, reference library, and a fine art gallery; the erection of a statue, the erection of almshouses, and the provision of scholarships to encourage pupils to remain at school who would otherwise leave to earn a wage. One member said the erection of an obelisk on Oliver's Mount had been mentioned outside the committee. It was generally thought that the money subscribed should be devoted to what would obviously be a Victorian memorial, but eventually small sub-committees were appointed to report on various schemes to a full committee on May 2.

INSTITUTE OF SANITARY ENGINEERS.—At a meeting of the Election Committee held on the 10th inst. the following were elected as Associates:—S. L. Bartolomew, Clapham; C. E. S. Crawcour, Bray, Ireland; J. Moore, Whitley.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.
16.—WATER-CLOSET FLUSHING APPARATUS, &c.

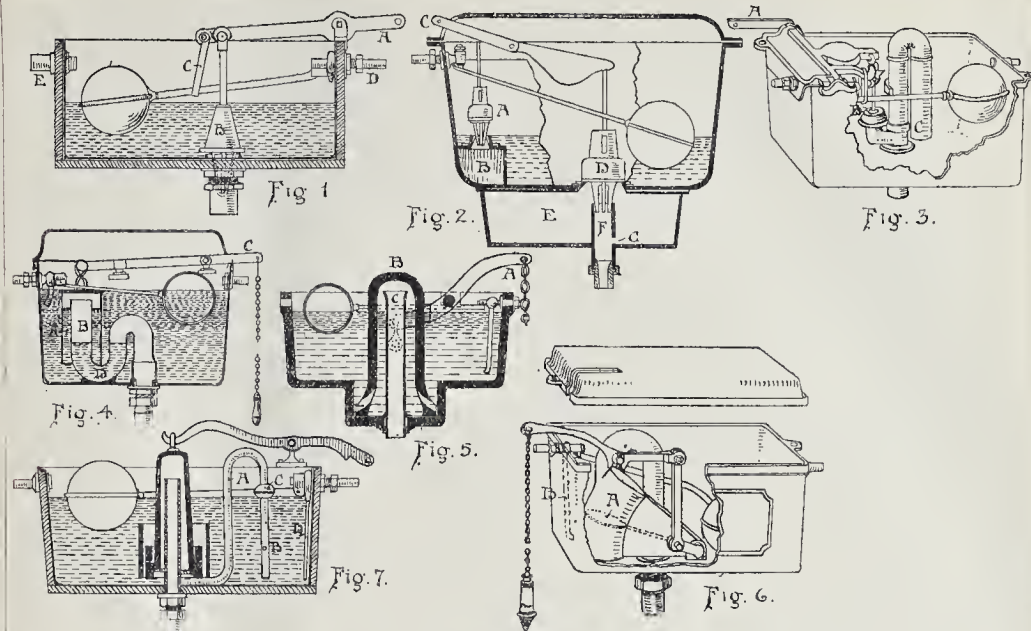
NO water-closet, however good it may be, will be satisfactory unless it is adequately flushed. The dribble of water which was formerly admitted to the basin through a small pipe was insufficient to cleanse the basin, and was absolutely useless for flushing the trap, soil-pipe, and drain. In the case of valve-closets, where the basins retain a considerable quantity of water, the soil may be carried through the trap by the rush of this water alone, but other closets require an adequate supply of water discharged in sufficient volume and at a sufficient velocity. In order to prevent waste of water, public water companies almost invariably insist on some kind of "water-waste preventer" being fitted to every closet, so that no more than a stipulated quantity of water can be used at each flush. The limit is usually fixed at 2 gals., and in such cases a closet and trap must be selected which will be thoroughly cleared by the proper discharge of this quantity of water.

Experiments have shown that, while this quantity is sufficient to clear a good wash-down closet and trap, it is not sufficient to carry the soil through a moderately long branch-drain and through the disconnecting trap placed between the house-drain and sewer, nor is it sufficient to carry the soil through the trap of a wash-out closet in every case. Eighteen tests were made by Dr. Charles Porter, of Stockport, with a well-known wash-out closet. In six tests a 3-gallon flush was used, and although the closet-trap was cleared in every case, the 4-in. disconnecting trap was cleared only twice; twelve tests with 2½-gallon and 2-gallon flushes showed that these were utterly inadequate—in eight cases the closet-trap was not cleared, in five the drain was not cleared, and in every case the disconnecting trap retained a portion of the soil. The results of tests with a wash-down closet were much better; the closet-trap and drain were cleared by a 2-gallon flush, but in no case was this sufficient to clear the 4-in. disconnecting trap. A 2½-gallon flush was not very much better, but three gallons invariably cleared the closet, drain, and trap. In all cases the drain was 47 ft. long with a gradient of 1 in 40, and had one rounded right-angle bend. With a 6-in. drain (gradient 1 in 60) and a 6-in. disconnecting trap, even a six-gallon flush cleared the trap only twice in four tests. These and other experiments show clearly that the limit of 2 gallons is too low, and there is a growing feeling that all water companies ought to be compelled by law to follow the example of Brighton and some other authorities in allowing at least 3 gallons for flushing a water-closet. The extra cost of a 3-gallon cistern is very small, and this size ought to be used in every case where the regulations admit or where the water supply is private. Many siphonic closets require a 3-gallon flush to ensure siphonic action.

It was at one time the practice to supply water-closets through a valve (either simple or regulating) placed in the cistern used for storing drinking water, but this arrangement is now almost universally condemned by sanitary authorities, and ought never to be adopted. Valve-closets are often supplied through some kind of valve fitted on the supply-pipe under the seat of the closet. The simplest forms are the "Stool" and "Cottage" valves, but as these continue to supply water as long as the handle is held up, they are not as a rule approved by water companies. Regulating valves were therefore introduced, which close automatically after the passage of a certain quantity (usually 2 gallons) of water, whether the lever is held up or not. All these valves are apt to get out of order, and water-closets are now generally supplied directly from a separate cistern having an inlet controlled by a ball-valve, so that the supply is automatically shut off when the cistern is full.

Water-closet flushing cisterns are of three main types—the valve, the siphon, and the tipper. A fourth kind, which may be called the pneumatic, may be used with high-pressure supplies.

1. Valve Cisterns.—The simplest form of cistern contains a single valve. Fig. 1 shows



Illustrations to Student's Column.

a wooden cistern of this kind lined with lead. When the lever at A is depressed, the valve B is raised from its seating, and the water continues to flow down the flush-pipe as long as the lever is depressed or until the cistern is empty. In order to prevent a continuous flow of water, the flushing lever in this example is attached to the lever of the ball tap by the link C, so that the ball is raised and the water shut off as long as the flushing lever is depressed at A. An arrangement of this sort is demanded by many water companies. The inlet is shown at D and the overflow at E.

Double valve cisterns consist of two chambers, usually formed by means of a longitudinal partition; in the first chamber the inlet and ball-cock are placed, and also a valve fitted on a small compartment communicating with the second chamber, in which the flushing-valve is placed. The two valves are so connected to the flushing lever that one is closed while the other is open. Fig. 2 shows such a cistern fitted with an after-flush box for use with a valve-closet. When the cistern is being filled the valve A is open, and the water passes through the opening into the small compartment B, and thence into the second chamber of the cistern, until both are filled to the level at which the ball-valve is closed. When the flushing lever at C is depressed it closes the small valve A, and thus closes the communication between the two chambers, and at the same time opens the flushing valve D so that the water in the second chamber pours down into the after-flush box E and the flush-pipe F. On releasing the lever, the valve C is closed and the valve A opened, and the water stored in the first chamber passes into the second, thus lowering the ball and admitting a fresh supply. A small hole G in the flush-pipe near the bottom of the after-flush box allows the water in this to drain away after the valve D is closed; and an air-pipe carried up from the box to the top of the cistern supplies the necessary air.

Sometimes the two chambers are above each other, the lower containing the amount allowed for flushing. In cisterns of this kind a stand-pipe passes upwards from the top of the lower chamber through the upper chamber to a point above the water-level, and the spindle attached to the flushing-valve is carried down the stand-pipe, which also serves as an air-pipe for the lower chamber.

The upper chamber of such cisterns is sometimes large enough to hold four to six gallons, an arrangement which is advantageous where the water-supply is intermittent.

It is obvious that if the flushing lever of a valve cistern is released too soon, only a portion of the water will be discharged, and although this may be sufficient to clear the basin, it may be utterly inadequate to flush the soil through the closet-trap and drain. The chief advantage of these cisterns is that they are less noisy than the common siphon cisterns, which are objectionable on account of the loud gurgling and sucking sound caused by the inrush of air as the water reaches the foot of the short leg of the siphon. The double-valve cistern has the further advantage of being more silently filled, especially if a pipe is carried from the outlet of the ball-valve to the bottom of the first chamber, as the end of this pipe will be always below water. In some valve-cisterns a float is attached to the flushing-valve, so that this does not return to its seating as soon as the handle is released; this device ensures the discharge of practically the full flush every time the handle is pulled.

2. Siphon Cisterns.—The water in these is discharged by siphonic action, and the principal difference between the various kinds lies in the method of starting this action. Four methods are in general use—the valve, the dome, the plunger, and the displacer. In the valve siphon cistern (fig. 3), the depression of the flushing lever A raises the valve B and admits water into the long leg of the siphon; on releasing the lever, the valve closes and the greater portion of the remaining water is drawn up the short leg C and siphoned out. If, on the other hand, the lever A is held down, the water continues to flow through the open valve B (exactly as in an ordinary single-valve cistern), but the discharge is less rapid than when the siphon is in action. In the illustration the cistern is of cast-iron and the siphon of brass; in cheaper cisterns the siphon is of cast-iron. A link connects the flushing-lever and the ball-lever, so that the latter is held up and the water shut off as long as the end A of the flushing-lever is depressed. An objection often raised to this type of cistern is that the valve may get out of order: on the other hand, the valve is noiseless in action and starts the siphonage most effectually.

Two examples of the dome siphon cistern are given in figs. 4 and 5. Winn's "Acme" cistern (fig. 4) has been very largely used. The dome or cap A forms with the stand-pipe B an annular siphon. On depressing the flushing-lever at C the dome is raised, and the water in the annular space rises with it and charges the siphon. The lever may then be released, and the siphonic action will continue till the cistern

is practically empty. The trap at D renders the starting of siphonic action more certain and more easy. The mechanism is extremely simple, and there are no valves (except the ball-valve) to get out of order. The cistern is made with tapered sides to reduce the risk of breakage by frost, and can be obtained of cast-iron, as shown, or of wood lined with lead, and in sizes from 1 to 4 gals.

The cistern illustrated in fig. 5 is made of white or amber enamelled stoneware with the movable dome of the same material. The stand-pipe is of lead 1½ in. in diameter, extending a little above the top of the cistern to prevent secret waste, and the flushing-lever is of cast iron. Although known as Duckett's "A1" Plunger Cistern, it is really of the dome type. The flushing-lever is forked at the inner end and attached to the dome by a link on each side as shown by the dotted lines. The lower portion of the dome is of greater diameter and fits somewhat closely into the sunk portion of the cistern. On depressing the lever at A, the dome B is raised, and when the lever is suddenly released, the dome acts as a piston sliding in the sunk portion of the cistern, and forces the water upwards over the lip of the stand-pipe, thus starting the siphonic action, by which water is drawn through the holes in the lower part of the dome until the cistern is nearly empty. Very similar cisterns are made of cast-iron with cast-iron domes. In order to ensure a sufficiently rapid descent to force the water over the lip of the stand-pipe, the dome must be heavy, it is therefore almost invariably noisy in action, and even in the best cisterns of this type the siphon cannot always be started at the first or even second attempt.

In the plunger siphon cistern the siphon is started by water forced into it by means of a plunger or disc. In some cisterns of this type, siphonic action stops when the handle attached to the flushing-lever is released; these have the disadvantage of the ordinary valve cistern in not giving the full flush every time the closet is used. Others, however, continue to act after the handle is released. Fig. 6 is an example of the latter kind, known as the "Monarch." When the handle is pulled, the disc A (shown by dotted lines) is raised and forces a small quantity of water over the bend at the top of the siphon, and thus starts the siphonic action. In other cisterns of the same type, the plunger works horizontally, and in others vertically. These cisterns are less noisy than those with heavy domes, and siphonage is more readily started. They are,

however, somewhat more complicated. The plunger and cylinder in the best cisterns are made of brass.

Siphonage is sometimes started by means of a larger "displacer" attached to the flushing-lever and dipping into the water. The displacer is so designed that, when the lever is depressed, the bulkier portion of the displacer enters the water and raises the level of the water sufficiently to cause it to overflow the standpipe of the annular siphon. In these cisterns, the top of the standpipe must obviously be below the top of the cistern, and secret waste may possibly occur.

3. *Tipper Cisterns.*—Cisterns of this type are not often used for water-closets, as they give rise to a considerable amount of splashing, and are also somewhat noisy. The essential part of the apparatus is a tipper or tumbler swung on pivots and attached to the flushing lever in such a manner that, when the handle is pulled, the tipper is partially turned and the contents are discharged into the chamber in which the tipper is swung, and pass thence down the flush-pipe.

4. *Pneumatic Cisterns.*—These are only adapted for high-pressure supplies. The cistern is a closed galvanised iron cylinder regulated to hold a certain quantity of water in addition to a quantity of compressed air. When the closet is not in use the cistern is empty, and there is therefore no risk of breakage by frost. In one apparatus of this kind pressure on the seat of the closet opens the supply valve, closes the lower portion of the flush-pipe, and allows water to flow up the flush-pipe into the cistern, where the contained air is compressed to an extent corresponding with the pressure of the water. With a water-pressure of 70 lbs., 2 gallons will enter the cistern in less than a minute. As soon as the pressure on the seat is withdrawn the supply-valve closes automatically, and in so doing opens the flush-pipe, down which the water in the cistern is forced by the compressed air with great velocity into the closet-basin. There is, of course, a possibility of the valves and other mechanism getting out of order. The apparatus has not proved satisfactory, and cannot be recommended.

In "combination" closets the cisterns are fixed immediately above the seats, and may be either of valve or siphon type, but with specially large outlets. In some valve-cisterns of this kind the outlet is 4 in. in diameter. Three-gallon cisterns ought to be used where possible. Siphonic closets must be fitted with special cisterns, adapted for the several closets, and designed so that the full flush will be discharged whether the handle is continuously held or immediately released. Valve-cisterns with floating valves may be used, or suitable siphon cisterns. The capacity ought to be that recommended by the maker of the closet. Some makers say that their siphonic closets will work "perfectly" with a 2-gallon flush, but at the same time they "strongly" recommend a 3-gallon cistern "where permitted by the water companies." This strong recommendation appears to throw some doubt on the perfection of the action with a 2-gallon flush, and the larger cistern ought therefore to be used.

Cisterns are commonly made of cast iron painted inside and outside, but the paint soon wears off, and the metal rusts and discolours the water, and eventually stains the basin. Galvanised-iron cisterns (either cast iron or sheet iron with seamed or riveted joints) are very little better in this respect if the water is soft. Vitreous enamel is often applied to cast-iron cisterns, and is a much better protection. Iron cisterns are, however, somewhat noisy, and are apt to be cracked by frost, especially if fixed in external closets. Wood cisterns are better in both respects, and may be lined with lead weighing 4 lbs. or 5 lbs. per superficial foot, or with copper. Glazed fireclay or porcelain cisterns are also occasionally used, but are not suited for external closets on account of the risk of breakage by frost. All cisterns in houses ought to be provided with covers to deaden the sound, or entirely cased with woodwork.

Many water-closets are undoubtedly very noisy in action. The rush of the water in the basin cannot be entirely prevented, but the sound may be deadened by the use of a hinged lid over the seat, and by fixing the cistern at a low level with a correspondingly larger flush-pipe and valve or siphon; it is one advantage of the "Combination" closets that the discharge creates very little noise in the basin. Flushing cisterns are often very faulty in this respect.

The ball-valve may admit the water with a loud hissing sound, or may give rise to "water-hammer" in the pipes; the mechanism (as in some dome siphon cisterns) may be very clumsy; and in siphon cisterns the inrush of air at the conclusion of the flush may cause a loud gurgling and sucking sound. In the case of high-pressure services it is a good plan to fix a screw-down stop-cock on the supply-pipe, so that the supply to the ball-valve can be regulated. If this is done, and the ball-valve is of the full-way type, hissing and water-hammer will be almost if not altogether prevented. A simple device for deadening the noise of the supply consists in attaching a pipe to the outlet of the ball-valve and carrying it down to the bottom of the cistern, so that the end is either permanently below the water remaining in the cistern after each flush, or is soon covered by the incoming water. Such pipes are shown at D in fig. 5, and at B in fig. 6. Cisterns with heavy mechanism ought not to be selected. Several devices have been designed for preventing the noisy rush of air in siphon cisterns. One of these (Baxendale's "New Pattern") is shown in fig. 7. The cistern is of the dome type, and an air-pipe A is connected near the foot of the stand-pipe, and carried up above the water-level and bent downwards again nearly to the bottom of the cistern. In this pipe a hole B is bored. When the siphonic action is in progress the float C descends and covers the hole, but as it does not fit closely against the pipe, a small amount of air is admitted at B during the descent of the float. This gradual introduction of air checks the siphonic action very slightly, but greatly reduces the rush of air when the cistern is emptied. The makers claim that "the sucking, swirling noise is entirely prevented."

Many cisterns are fitted with $\frac{3}{4}$ -in. ball-valves, but this size is too small for rapid filling if the pressure is low, and for silent action if the pressure is high. It is much better to have a larger ball-valve, controlled where necessary by a stop-cock on the supply-pipe.

Cisterns are usually actuated by means of a chain and handle attached to the flushing lever, but for asylums a brass slide working in a dovetailed groove is sometimes used; this is a convenient arrangement, and has a good appearance. A more novel device is a press-button, like that used for electric bells. Automatic seat-action is desirable in certain places. Numerous devices have been designed. One example was illustrated in the preceding article, and another has been described under the heading of pneumatic cisterns. The mechanism ought to be as simple as possible.

Flush-pipes from cisterns fixed in the usual manner about 6 ft. or 7 ft. above the floor are commonly $\frac{1}{2}$ in. or $\frac{3}{4}$ in. in diameter according to the type of cistern, and may be of lead (not less than 9 lbs. per yard for $\frac{1}{2}$ -in. pipe and 10 $\frac{1}{2}$ lbs. for $\frac{3}{4}$ -in.), or of galvanised iron, copper, or brass. Flush-pipes of the three last-named metals, bent to the proper curves, are supplied by the makers of the cisterns and closets, and are more easily fixed than lead pipes; they have also the advantage of being of the length which has been found by experience to be best suited to the closet and cistern. Galvanised iron can only be recommended for cottages, workshops, and other places where strict economy as well as rough usage must be considered. The brass pipes may be either polished or nickel-plated, and the copper may be finished in various ways.

OBITUARY.

MR. W. BASSETT-SMITH.—We regret to announce the death at Clapham, on the 10th inst., in his seventy-first year, of Mr. William Bassett-Smith, of North Side, Clapham Common, and of Drummond-chambers, No. 10, John-street, Adelphi, W.C. Mr. Smith was a member of the firm of William & Charles Aubrey Bassett-Smith. Of his architectural works we may mention Christ Church, Penge (1884-5), St. John's Church, Highbury Vale (1881-2), and the addition of the tower, spire, and south aisle, St. Mary's Church, Caterham—of which we published an illustration on November 21, 1883. The firm prepared plans and designs for the church of St. Barnabas, in North Side, Clapham Common, at the corner of Lavender-gardens, four years ago, and for the reredos—the latter being executed by Mr. Thomas Rudge, of Clapham Common. On April 20 last year a faculty was granted by the Consistorial Court, sitting in St. Paul's, under the presidency of Dr. Tristram, K.C., Chancellor of the Diocese of London, for carrying out, at a computed cost of about 6,000*l.*, alterations

and an enlargement of the church of St. Stephen, Westbourne Park-road, Paddington (Messrs. F. & H. Francis, architects, 1855-6), to embrace the taking down of the end of the church, which faces westward, the building of a new chancel with an apsidal end, a sanctuary, a new gallery staircase, a new vestry, new porch, new south chancel aisle, and a rearrangement of the interior, the re-pointing of the walls and general repair of the fabric, after the plans and designs prepared by Mr. Smith and his partner; the reredos and altar are by Mr. Pippet, of Solihull. The firm carried out the recent extensive restoration of the parish church of Stickeney, in Lincolnshire, at a cost of about 2,500*l.*, in accordance with a report made by Mr. Smith, in 1884 upon the condition of the tower, which, constructed principally of local sandstone, had become unsafe, and at the late Mr. Butterfield's suggestion had been fitted, though, as it proved, to little purpose, with an interior wooden frame for taking the weight of the bells off the wall. Mr. Smith recommended the removal of the bells, as well as of the upper half of the tower; this was done in 1887, and the porch was rebuilt. In the following year a tender of 1,735*l.* by Mr. T. F. Halliday, of Stamford, was accepted for the rebuilding of the tower and re-hanging of the bells; other repairs were also made, and Messrs. Warner, of London, have rehung the bells. Messrs. W. & C. A. Bassett-Smith superintended a remodelling of the sanitary arrangements at St. Mary's National Schools, West End-lane, Hampstead, and were the architects of the Church of St. Paul, Plumstead Marshes, which, when completed, after the entire designs, will accommodate 625 persons at a cost of about 4,800*l.* They were also architects for the restoration (Messrs. King & Ridley, of Lutterworth, contractors), at a cost of about 1,800*l.*, of New Wolvey parish church, Warwickshire, including new oak roofs for the nave and two aisles, a parapet on the nave roof, &c. (Mr. C. A. Bassett-Smith); and, in conjunction with Mr. R. Philip Day, of the Church of St. Gabriel, at Willesden Green (1897), Mr. J. Bentley being the contractor.

GENERAL BUILDING NEWS.

MARBLE HALL AND LOUNGE, DE KEYSER'S ROYAL HOTEL, VICTORIA EMBANKMENT.—De Keyser's Royal Hotel was opened in 1874, taking the place of a former hotel which existed in Chatham-place before the completion of the Embankment. When the present hotel was opened it was not intended that it should accommodate the number of visitors (over 400) which it now does, as the hotel has, since the above date, been twice enlarged. To comply with the requirements of hotel visitors of the present day, it became necessary to have a lounge in addition to the existing drawing-smoking, and reading-rooms, and it was therefore determined to abandon the courtyard into which vehicles then drove, and to form the lounge that has now been completed. This lounge measures 58 ft. by 52 ft., and has a central dome 35 ft. in diameter and over 30 ft. high. There is also an outer entrance-hall nearly 40 ft. long and 24 ft. wide. The work has been carried on without interrupting the business of the hotel, a temporary entrance being provided during the execution of the works. The new addition is paved with marble mosaic with a solid pattern to mark the circular floor under the dome. The dado is formed with a bronze base, alabaster die, and grand antique coping. The columns are of Languedoc marble with bronzed caps, the cornices in plaster, and generally painted white, and the walls are lined with gilt Japanese leather paper. The alterations have been carried out under the superintendence of the architects, Mr. E. A. Gray and Mr. H. A. Pelly, by Messrs. Holland & Hannen, of Bloomsbury, their foreman in charge being Mr. W. Mann. The alteration has necessitated the entire reorganisation of the offices and control of the hotel business. The following firms have carried out certain works: Messrs. Burke & Co., Newman-street, W., the marble work; Messrs. Dent & Hellyer, Newcastle-street, W.C., the sanitary work (which has been materially improved and extended); Messrs. A. L. Moore & Co., Southampton-row, W.C., the ornamental glazing of the dome and other parts; Messrs. Adams & Co., the electric bells; Messrs. Rasleigh, Phipps, & Co., the wiring for electric light; Messrs. Bennett, the electric light fittings; Messrs. Peacock & Co., Clerkenwell-road, E.C., the house telephones; Messrs. Simpson & Co., Fimlico, certain alterations to the hydraulic lifts; The Van Kannel Door Co., Finsbury, have also supplied two of their revolving doors for the entrance hall; Messrs. Lindsay, Neale, & Co., of Paddington, did the constructional steelwork; Mr. J. Annan, of Picnic, executed the cornices, which are in fibrous plaster, and prepared all the modelling for the plaster work.

THE NEW IMPERIAL THEATRE, WESTMINSTER.—In the new Imperial Theatre, which has just been opened, nothing remains of the old, except the outer walls and the fabric of the old dressing-rooms at the back of the stage. The work of reconstruction has included a new roof, an entirely new auditorium, new staircases and foyers, a new stage, and the most modern system of electric lighting. This has been carried out by Mr. Frank Verity, the architect, under Mrs. Langtry's personal

direction. The whole work has been finished in three and a-half months, having been commenced on January 1. The theatre has a holding capacity of 1,150 persons. The auditorium is 50 ft. wide, the proscenium opening 30 ft. wide and 25 ft. high, with a stage 40 ft. in depth and 65 ft. in width. The conventional scheme of modern theatre decoration has been disregarded, the whole treatment being of a purely architectural character, in which marble and burnished metal are the dominating materials employed. The style is that of the period of the First Empire. The general wall surface is of Pavonazetta marble, broken by the vertical lines of plasters of Sienna marble with metal caps and base. The proscenium opening represents the façade of a temple; on each side of the opening are two monoliths of Greek Cipollino marble upon Pavonazetta pedestals, the whole surmounted by a pediment of statuary marble. Metal enrichments are employed throughout the auditorium. Apart from this, the colour-relief is obtained from the burnished metal and the draperies of the two Royal boxes, and the draperies on the principal tier front, on the side boxes, and on the wall surfaces behind the various ranges of seats. No decorative painting or gilding of any description will be found in any part of the auditorium. The two Royal boxes, one on each side of the proscenium, form the most prominent feature of the interior, standing out in semicircle and carried up through the height of the two tiers, each surmounted by a dome from which are suspended curtains of a lustrous yellow silk with white powderings of fleur-de-lis. The drapery over the front is of green silk, richly embroidered with gold. The curtains, hangings, and embroideries have all been designed by the architect and executed by the Royal School of Art Needlework under the supervision of Mr. Verity. There is no painted act drop and there are no tableau curtains; but an adaptation of the old-fashioned drop curtain (of hideous green baize) in rich green and gold, which lowered hangs in graceful festoons with a deep valance and embroideries; thus, when the curtain is raised, forms an architectural frieze—a decorative substitute for the more conventional "proscenium border." A velarium forms the ceiling of the gallery, which in the general scheme partakes of the character of an atrium or forecourt. All the reserved seats in the house are upholstered in buttercup yellow. The principal foyers are decorated with an arabesque colour treatment in two tones, green on white or black on white. The lighting of the theatre depends throughout on electricity. The main source of light in the auditorium is by lamps concealed over sheets of amber-tinted glass in the ceiling; the effect of warm sunlight is thus produced. Electric torches are fixed round the tier fronts, and hanging lights of classical design are suspended from the marble walls. The tiers are built on the cantilever principle. Each section of the house has its independent foyer accommodation in the stalls and balcony, this is in addition to the buffet. Messrs. John Allen & Sons, Limited, of Kilburn, were the builders, and the clerk of works was Mr. E. W. Hands. The modelled plaster work and metal enrichments by Messrs. Geo. Jackson & Sons; the steel work by Messrs. R. Moreland & Sons, Limited; the electric lighting, both for stage and front of house, was carried out by Messrs. Vaughan & Brown, who also supplied the gas braziers, fire hydrants, wrought iron and glass ceiling for sunlight effects, are lamps, fireproof curtain and outside iron escapement, and ventilation. The marble work was by Messrs. Farmer & Brindley.

TOWER, CHICHESTER CATHEDRAL.—The Archbishop of Canterbury visited Chichester on the 16th inst. to take part in the dedication of the north-west tower of the cathedral, which has been rebuilt at a cost of just over 8,000*l.* No authentic records are in existence as to the exact circumstances in which the old tower fell, but the disaster is supposed to have happened about the year 1634, the cause most probably being the defective nature of the foundations. Not until the episcopate of the late Dr. Durnford were any active steps taken towards the rebuilding of the tower. When a fund was started for a general restoration of the cathedral the executive committee found that, owing to the insecurity of the west bay of the nave vault, the rebuilding of the north-west tower was the work which most demanded attention. The late Mr. J. L. Pearson prepared a design for the rebuilding of the tower, which, subject to certain modifications, was ultimately adopted. The south side of the tower, forming part of the nave of the cathedral, was intact, although the arches of the triforium and clerestory stages were walled up. All that remained was to carry the same design round the three remaining sides, but there was a good deal of controversy as to the character of the exterior of the building before a satisfactory agreement was arrived at. Messrs. Luscombe & Son, of Exeter, were given the contract for the work, which was carried out in sections, the money for each section being first obtained in subscriptions before the next stage was proceeded with. Mr. Frank Pearson succeeded to the duties of architect on the death of his father. The new tower, which resembles in its general character the south-west tower, is about 34 ft. square over all, and from floor to ceiling, a height of nearly 100 ft.

is open to the cathedral. The work has occupied about 2½ years.—*Times.*

DISPENSARY, CANTERBURY.—The foundation-stone of the new Canterbury Dispensary premises has just been laid by the Archbishop of Canterbury. Mr. F. T. Gentry is the architect, and Mr. A. Bromley is the architect.

PROPOSED NEW MUNICIPAL BUILDINGS FOR BOSTON.—A special meeting of the Boston Town Council was held recently, the Mayor (Ald. W. T. Simonds) presiding, to consider the advisability of purchasing a site in West-street for the new municipal buildings which it is proposed to erect at a cost of 16,500*l.* The Mayor proposed that a site in West-street, consisting of 1,140 square yards, be acquired at a cost of 1,400*l.*, and that a contract to that effect be signed. This was agreed to after discussion.

BRIGHTON PUBLIC LIBRARY.—The ceremony of laying the commemorative stone of the new municipal buildings in Church-street, Brighton, which are to include a public library, museum, and art gallery, took place recently. On the ground floor there will be a separate entrance to the Dome, 20 ft. wide, in Church-street, and separate entrances will also be provided to the library, museum, and art galleries. There will be a public newsroom, 73 ft. long and 28 ft. wide, and the dimensions of the leading library will be 88 ft. 6 in. by 44 ft., with a counter 65 ft. in length. There will also be a public reading-room for adults, and one for boys. The reference library will be a room 6 ft. long and 28 ft. wide, and the museum will also have on the ground floor, a committee-room, 28 ft. by 24 ft., and a pottery-room, 50 ft. by 28 ft. On the first floor, facing Church-street, will be a new picture gallery, 110 ft. long and 28 ft. wide. The present gallery will be used for loan exhibits, and there will be another room which will be used for local views. The entrance to the Dome in the Pavilion grounds will be improved by erecting a porte-cochère in the place of the old wooden pent-house which at present exists. The buildings have been planned by Mr. F. J. C. May, Borough Engineer and Surveyor.

ELECTRICITY WORKS, KEIGHLEY, YORKSHIRE.—The electricity works at Low Bridge, which will supply Keighley with electric light, have been completed. The contractors were as follows:—Masonry and concrete, carpentry and joinery and floor tiling, Mr. T. E. Sugden, Keighley; constructional steel work, Messrs. Carter Bros., Limited, Manchester; plumber and glazier, Messrs. W. & J. Harrison, Keighley; slater, Mr. W. Thornton, Keighley; plasterers, Messrs. Edmondson Bros., Keighley; painting, Messrs. W. Seaton & Co., Keighley; wall tiling, the Lancashire and Cheshire Opalite Tile Company. The architect, Mr. H. Chilvers, was recently presented by Alderman Paquet with a dressing-bag on behalf of members of the staff and some of the contractors.

SCHOOLS, ST. ALBANS.—New board schools have been erected at St. Albans in the Old London-road. The site is at the end of the road nearest the town, and is situated about 275 ft. above the sea level. It has a frontage to the Old London-road of 105 ft., and an average depth of 160 ft. The Education Department sanctioned a scheme of four classrooms, each for fifty boys, with provision for a future increase by two classrooms, also to accommodate fifty boys each. In the school, as now built, there is a schoolroom for 100, hereafter to be divided by a sliding partition, into two classrooms, each for fifty. The precautions has been taken to build the lozenges, cloakrooms, &c., of the size that will be required for 300 scholars; so that enlargement in this portion of the buildings will be unnecessary to complete the school. The storeroom of the larger school is to be used as a masters' room for a time before the permanent masters' room is built. The walls of the buildings are carried out in local red bricks, and the roofs are covered with Woburn red plain tiles. In the oak bell-turret is hung the bell from the house at Colney Park, which was sold when the old manor was pulled down. The floors in the passages are of Stuart's granolithic, and the rest of the floors are of Duffy's pitch-pine blocks. The heating is by Shorland's stoves. Fresh cold air is admitted by Tobin tubes. The floors of the classrooms are in steps. The plans for the schools have been prepared by Messrs. Clarkson, architects, of St. Albans, who have now completed four school buildings for the Board. Messrs. Whitley & Jarvis, of St. Albans, were the builders, and their contract was for 2,700*l.* Mr. H. Tanner was clerk of the works. The lavatories and other sanitary appliances are from Messrs. Adams, of Leeds. The whole of the building is lighted by gas, the fittings having been supplied by Messrs. Strode & Co.

THE PORTMAN MARKET.—The Portman Market in Church-street, Edgware-road, was opened on the 18th inst. The market, which is for meat, fish, and vegetables, contains 175 stalls and twelve shops, which are divided by avenues running diagonally as well as straight across. The building was designed by Mr. H. T. Gunton, of Messrs. Gordon & Gunton.

HOTEL, GLASGOW.—The New Century Hotel in Holm-street, Glasgow, was opened on the 10th inst. The building, which is intended for the middle classes, is 130 ft. by 60 ft., and has seven flats, containing upwards of 400 bedrooms. The building is fitted with lifts and is lit by electricity. Messrs.

Frank Burnett & Boston, of Glasgow, were the architects.

PROPOSED SCHOOL OF COOKERY, NEWCASTLE.—A Local Government Board inquiry was recently held in the Council Chamber, Town Hall Buildings, Newcastle, by Colonel A. J. Hopper, R.E., regarding the application of the Corporation to borrow 10,000*l.* for the erection of a school of cookery in Northumberland-road, Newcastle. Mr. Dyson submitted the plans for the school, which he explained to the Inspector.

HOTEL, SEATON HIRST, NORTHUMBERLAND.—The new hotel built by Mr. Deubar, Newcastle, at Seaton Hirst was opened recently. The building was erected by Messrs. J. G. Douglas, of North Seaton, at a cost of 10,000*l.*, from plans by Mr. Benjamin F. Simpson, F.R.I.B.A., Newcastle.

CONGREGATIONAL CHURCH, HANLEY.—On the 18th inst. the foundation-stones of a new Congregational chapel were laid at Hanley. It is to be called the Park Congregational Church. Messrs. Wood & Hutchings, of Tunstall, are the architects, and at present the school and classrooms alone are to be erected, at a cost of 2,000*l.*

BATHS, BATTERSEA.—On the 20th inst., Sir Charles Dilke, M.P., opened the new baths and washhouses which have been constructed at Nine Elms by the Battersea Borough Council. A site was selected in the Battersea Park-road, abutting upon Cringle-street, and the plans of Mr. Francis J. Smith, of Westminster, were accepted in competition. The new baths have been erected by the Works Department of the Borough Council, under the supervision of the Surveyor, Mr. J. T. Pidditch. The area of the land upon which the baths are erected is 83,020 superficial ft. but an additional 10,000 ft. of ground adjoining has since been purchased, so that future additions can easily be carried out if deemed advisable. The whole of the establishment devoted to public purposes is arranged on the ground floor, the upper floor in the Battersea Park-road being occupied by the rooms required by the Baths Committee and the superintendent's residence, other portions in the rear being used for the establishment laundry and artists' and club-rooms. The three chief entrances are in the thoroughfare mentioned, the private entrance to the board-room and superintendent's apartments, the men's entrance to the swimming-baths and slipper baths (of which latter there are thirty-eight), and the women's entrance to their slipper baths, of which there are twelve. The private baths are to be of enamelled iron, with divisions of marbled slate. The swimming-bath has a water area of 150 ft. by 50 ft., and faces Cringle-street. Steam is also to be used for heating the buildings and water for the slipper baths. Attached to the swimming-bath are the club-rooms, as provision has been made for utilising the structure as a public hall during the winter months for concert and other purposes. A gallery runs round three sides of the bath, with staircases for ingress and egress; and it is estimated that the accommodation at the disposal of the authorities will suffice for about 1,000 persons. The bath will be 3 ft. 6 in. deep at its shallow end, and 6 ft. 6 in. at the deep end. The entrance to the public laundry and washhouses will be at the extreme or northern end of Cringle-street. This establishment is designed to meet the requirements of sixty-four persons. Fifty-three washing compartments are provided, with three washing machines, sixty-three drying-horses, and four hydro-extractors. In the ironing-room adjoining will be four mangles, with ironing and folding tables. The house handy on the first floor is to be fitted up with the necessary machinery for doing the whole of the washing in connexion with the establishment. The buildings are of fire proof construction. They are erected with red bricks and Portland stone dressings in the English Renaissance style. Mr. F. R. J. Pearce and Mr. Mark Green have acted as superintendents of the work.

SANITARY AND ENGINEERING NEWS.

WATER SCHEME, ROCHFORD HUNDRED.—Mr. H. P. Boulnois, M.Inst.C.E., a Local Government Board Inspector, held an inquiry recently at the Board-room of the Rochford Workhouse, with reference to the Rochford Rural District Council's application for sanction to the borrowing of 25,000*l.* for works of water supply for Haldon, Hockwell, Hockley, Rayleigh, Rochford, and South Benfleet, and the Rochford special drainage district; and for the construction of works at Thundersley. The Clerk explained that out of an estimated total of 1,282 houses in the six parishes concerned, the scheme could supply 1,039. Mr. G. R. Strachan, engineer, explained the plans in detail. The quantity of water wanted was 100,000 gallons a day, and he was quite confident from tests that there would be that yield. Dr. Thresh, the county medical officer, had reported that the water was not only pure and soft, but the well was so constructed that contamination was practically impossible. The population to be served was between 3,000 and 4,000; and Mr. Strachan reckoned the well to be capable of supplying 6,000. The tower was to be 80 ft. high, and the tank would hold 40,000 gallons.

WATER WORKS FOR BEWDLEY.—The ceremony of turning the first sod of the Bewdley Water Works was performed on the 15th inst. by the Mayor of that borough. A scheme put forward by Mr. Berrington, C.E., of Wolverhampton, has been adopted. The contract for the works is 10,600l.

THE DOCKS AT BARROW-IN-FURNESS.—The lowering of the Ramsden Dock lock sill 24 ft. having been successfully accomplished, water has been let into it preparatory to drawing the piles of the coffer-dam. The contract has been executed by Messrs. John Aird & Co., and has involved the expenditure of 200,000l.

FOREIGN.

FRANCE.—At the Church of Sacré Cœur, Montmartre, the foundations for the tower have been commenced under the direction of the present architect, M. Rauline. M. Pagel, the sculptor, is completing the decoration of the Chapel de l'Armée, where the bas-reliefs represent military subjects. At the adjoining ancient church of St. Pierre the restoration work is being pushed on, and the choir is now detached from its surroundings and seen in its ancient condition.—The Municipal Council of Paris has decided on the formation of a new metropolitan line of railway connecting the Opera House on the one hand with Auteuil, on the other hand with Buttes-Chaumont. The Council is also considering the re-erection on the Place Dauphine of the monument to Desaix, the remains of which are at present preserved in the Magasins des Beaux-Arts at Auteuil.—M. Morin-Goustiaux, the architect, has been commissioned to prepare plans for the Cirque-Palace des Champs Elysées, which will replace the old Cirque des Champs Elysées.—The new buildings of the Sorbonne are to be traversed by a passage leading from Rue Saint-Jacques to the Place de la Sorbonne, which will be open to the public. It will be called Galerie Cuvier.—The widow of M. Falguère, the late sculptor, is about to arrange, in one of his former studios, a collection of the first models or *maquettes* of the most remarkable works of the great sculptor, also some of his works in marble and of his paintings.—The "Commission des Grande Travaux" of the Department of the Seine has issued a Report in favour of the completion of Boulevard Haussman from Rue Tailbot to Boulevard Montmartre, a work which has long been called for.—The Government has decided on the creation of a corps of Colonial architects, who will be employed in Indo-China, Guadeloupe, &c.—M. Bussière, of Bourges, has been elected President of the Society of Architects of the Centre of France.—The "Société des Amis des Monuments Rouennais" has bought the old house in Rue St. Romain, Rouen, which the municipality had intended to destroy.

The Minister of Public Instruction has been commissioned to institute a commission to inquire into the means of creating local provincial schools of architecture in France.—M. Weissenburger, architect, has been commissioned, along with M. Bussière as sculptor, to design a monument to be erected at Luneville to the memory of the late M. Erolmann, the joint author of the popular Erekmann-Christrian military novels.—The municipality of Troyes have opened a competition for a circus theatre, at a cost of 350,000 fr.—M. Girault, the architect who designed the monument to Pasteur at the Institute in the Rue Dutot, has completed a reliquary intended to receive the mask of Pasteur. It consists of a crystal coffer ornamented with six garlands of laurel in bronze chased and gilt, connected by an oak crown with a poppy finial.—The Architectural Department of the city of Paris is proceeding with a restoration of the Gothic fountain in the square of Notre Dame, the work of the architect Parfait Merlieux.

THE IMPROVEMENT OF THE NILE.—Sir William Garstin, Egyptian Under-Secretary of State for Public Works, has just returned here from a fifty days' journey of inspection up the Nile, which extended to Gondokoro, on the Uganda frontier. South of Gondokoro the Nile is now unnavigable, owing to its exceptional lowness. The main object of Sir William Garstin's journey was to inspect the *sudd* cutting with a view to deciding what further work should be undertaken and also to ascertain by measuring the river discharge above and below the *sudd* the amount of water lost in the marshes. The *sudd* has now been removed from the whole of the Bahr-el-Gebel, except for 23 miles. Owing to the early rainfall, the clearing of the last portion has been postponed to October, and will be completed by January next. The portions of the river cleared in 1900 by Major Penke are in good order, and there is no visible sign of fresh blocks. Lieutenant Denny, R.N., cleared four blocks at the south end of the swamps this winter, with excellent results. When the above-mentioned blocks have been cleared there will be a free navigable channel from Refaj to Omdurman, a distance of 1,200 miles.—The Cairo correspondent of the *Times*.

THE ARCHITECTURAL MUSEUM.—We learn that the King has been pleased to become the patron of the Royal Architectural Museum and Westminster School of Art in Tufton-street.

MISCELLANEOUS.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 18th inst., at 7, Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.—Building new churches at High Wycombe, St. John, Bucks, 175l.; and Holloway Christ Church, in the parish of Dethick Lea and Holloway, near Matlock Bath, 80l.; and towards enlarging or otherwise improving the accommodation in the churches at Chevening St. Bobolph, near Sevenoaks, 30l.; Llanddwywe St. Dwywe, near Dyffryn, Merioneth, 20l.; Lybury North St. Michael, Salop, 20l.; Walskington Holy Trinity, Middlesex, 35l.; Wendlebury St. Giles, Oxon, 25l.; and Worlington All Saints, near Soham, 15l. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Latchford St. James, near Warrington, 15l.; Leytonstone St. Augustine, Essex, 40l.; and Bishopswearmouth, St. Gabriel, Durham, 50l. The following grants were also paid for works completed:—New Foundry, St. Augustine, Leicester, 500l. on account of a grant of 1,000l.; Christy Church, on account of the Virgin, London, 50l.; Surfleet, St. Lawrence, near Spalding, 20l.; Newport, St. Cuthbert, Middlesbrough, 80l.; and Broadheath, St. Alban, near Altrincham, 30l. In addition to this the sum of 225l. was paid towards the repairs of twenty-eight churches from trust funds held by the society. The grants voted at this meeting have nearly exhausted the funds at the disposal of the committee, and contributions are invited to enable the committee to vote substantial grants and to continue the work which this society has carried on during the past eighty-three years. The annual general Court of the society will be held at three p.m. on Friday, May 17, at the Church House, Dean's Yard, Westminster Abbey, when the chair will be taken by the Archbishop of Canterbury, president of the society.

BIRMINGHAM ARCHITECTS AND THE UNIVERSITY BUILDINGS.—The statement that in the opinion of the University Council the principle of selecting designs by competition could not be advantageously adopted in the case of the new University building has raised considerable feeling among some of the subscribers to the funds of the University, as well as the architects of Birmingham, inasmuch as it will entirely exclude the latter from the opportunity of testing their ability to produce a suitable design for the proposed buildings. It has, therefore, been decided to request the Chancellor of the University (Mr. Joseph Chamberlain) to receive a deputation of architects and subscribers, who will place before him reasons why he should use his influence to have the question reconsidered, in the hope that, by means of a carefully-conducted competition, the best available architectural talent may be brought to the front. A requisition to Mr. Chamberlain asking him to receive such a deputation is in course of preparation.—*Birmingham Post*.

HOUSING SCHEME, &c., MANCHESTER.—At a recent meeting of Manchester City Council, the Sanitary Committee submitted for adoption a number of recommendations comprising the Blackley housing scheme, the extension of Monsall Hospital, and other measures for the provision of sanitary requirements in the city. The approval of the Council was asked to the following loans:—203 dwellings at Blackley, 60,000l.; labourers' dwellings (extras), 4,651l.; Monsall Hospital, 14,500l.; lavatories in city, 21,000l. Alderman Walton Smith, in presenting the proposal of the committee to the Council, said the housing scheme was intended to provide homes for a total of 650 persons who were displaced in consequence of the Long Millgate and Rochdale-road improvements, and the cutting of a new street from London road station to Ardwick. Estimating five persons to a family, 132 houses would be required, but they proposed to erect 203, which would leave seventy-one ready for further requirements. Cottages similar to those built at Miles Platting by the Corporation were to be provided, but larger gardens would be given. At 215l. per cottage the actual cost of building would be 43,045l., but the necessary sewerage and forming of a road on the estate brought the amount required to 60,000l. The extensions contemplated at Monsall comprised a laundry and a commodious waiting-room for friends who visited the patients, together with accommodation for convalescent patients who could not be kept in the wards. Alderman M'Dougall, in seconding the motion, said the houses at Blackley were to be built on land belonging to the Corporation. Sir John Harwood expressed the opinion that the dwellings built by the Corporation, according to the requirements of the Local Government Board, were far too expensive. They could be well built, he believed, 30 per cent. cheaper. Alderman Smith, in reply, said the Local Government Board would not allow them to deviate from their own by-laws. No Corporation dwellings were unoccupied, except a few in Post-street. Mr. Boyle moved an amendment proposing that the proposal be first submitted to the Council. The amendment was rejected and the proceedings and proposals of the Sanitary Committee approved.

PROPOSED WORKS DEPARTMENT, SHEFFIELD CORPORATION.—The Special Works Construction Committee, recently appointed by the Sheffield City

Council, have had before them a report by Councillor George Carr in regard to the proposal to establish a works department in connexion with the Corporation. In a lengthy report on Mr. Carr's scheme the Committee recommend the formation of a works department to execute certain work which in the past, has had to be done on behalf of the Corporation. The capital expenditure is estimated at 7,000l.

PROPOSED IMPROVEMENT OF MARINE PARADE, WESTON-SUPER-MARE.—On the 11th inst., at the Town Hall, Weston-super-Mare, Colonel A. G. Durnford, R.E., an Inspector to the Local Government Board, conducted an inquiry into an application by the Urban District Council for sanction to borrow 4,250l. for the widening and extension of the Marine Parade from Madeira Cove to a point westward, about 576 yards, terminating at the Pier Hotel. The scheme was explained in detail by Mr. Hugh Nettleton, the Surveyor to the Council.

PROPOSED BRIDGE, CATCLIFFE, YORKSHIRE.—On the 12th inst. Mr. A. G. Malet, A.M.Inst.C.E., an inspector to the Local Government Board, held an inquiry in the Board School, Catcliffe, relative to an application made by the Rotherham Rural District Council to borrow 2,600l. for the construction of a bridge across the river Rother, between the townships of Catcliffe and Treetor, and for the construction of the approaches. Mr. R. Bradbury, surveyor, handed in a detailed estimate and plans.

THE HOUSING QUESTION AND INSANITARY DUNDEE TENEMENTS.—The question of the housing of the working classes engaged the attention of the Works Committee of the Dundee Town Council on the 9th inst. A report by the inspector bearing on the provision of sanitary conveniences for city tenements was submitted. The report gave details regarding the nature and extent of such accommodation existing in the six registration districts of the city, viz. St. Peter's, St. Mary's, St. Clement's, St. Andrew's, Lochee, and Mains. The results, summarised in a letter from the inspector, showed that over the whole city there were 1,111 properties having either no sanitary convenience or what there was was of a very imperfect or deficient character. Of that number, 183 were devoid of any accommodation whatever, 734 had privy and a single accommodation, 102 had one water-closet, fifty-six had one water-closet and one privy, and thirty-six had more than one water-closet; but the accommodation under the three last heads was not, in his opinion, sufficient for the wants of the population and the separation of the sexes. In a large majority of the properties where only one water-closet was placed at the bottom of the main stair, with in some instances a privy and ashpit added, for the use of the whole male and female occupants of the building, the plans for those tenements had during the past thirty years or thereby been passed by the Works Committee of the Town Council as having sufficient sanitary conveniences for the male and female population, and the buildings had been erected in conformity with the plans thus passed. The Committee expressed the opinion that the information contained in the report was of great value, and ordered it to be printed and circulated among the members of Council, after which it was resolved to deal with the whole matter.

LORD PEEL ON CHAPEL ARCHITECTURE.—Lord Peel, a former Speaker of the House of Commons, in opening a bazaar in the Winter Hall at Leamington on Tuesday, April 23, for the object of raising funds for the erection of a new Wesleyan chapel at Kenilworth, had some words of criticism to offer with respect to chapel architecture. Lord Peel said he was happy to see in the account given of their object that they said the building they were about to erect would be in keeping with the historical associations of Kenilworth. He knew no reason why a place of worship—or any other house—should be ugly in its outside proportions. He thought we were outliving the day when those hideous erections that we saw in town and country were allowed to offend the eye and deface the recollection of places. He knew that in some cases—happily it would not be so in theirs—a deficiency of funds might oblige the erection of a very humble building, but in the humble building there was no need for disregarding the principles and axioms of taste. There was an exhibition now going on in London—he believed at the Agricultural Hall—where were shown a number of appliances by which buildings could be made of different kinds of materials, and it was hoped that by this means a stimulus might be given to street architecture. He hoped the funds collected by that bazaar would be sufficient to erect not only a place of worship convenient and capable of accommodating those of their persuasion and their church in Kenilworth, but one which would be a worthy adjunct to the surroundings of that most picturesque and interesting spot.

AMERICAN LUMBER.—The Baltimore Lumber Exchange expended 9,000 dol. on the exhibits it sent to the Paris Exhibition and to the Export Exposition at Philadelphia, and it claims that the money thus used brought a good return in the shape of greatly increased exportations. It publishes the statement that Baltimore's exportations of lumber and logs in 1900 exceeded that of New York and Philadelphia together. In consequence of the high price of poplar, which is much used in the manu-

facture of boxes, several cargoes of Nova Scotia spruce were imported to replace it. Some twenty years ago what is now known as North Carolina pine was unheard of in the home or foreign markets. Previous to that time no care was taken in preparing it for market; it was dried in the open air, and it soon became black and discoloured and almost useless, and the quantity shipped from Hampton Roads did not amount to 20,000,000 ft. a year. The process of kiln-drying has for some years been in operation, and the lumber is now brought from the mills bright and dry, and its quality is such that it is very extensively used in the home markets and in Europe generally. The quantity exported from Hampton Roads has risen greatly, and about 500,000,000 ft. are the figures for last year. It is very cheap and takes the place of white pine, cypress, and Georgia and Florida pine, to a great extent for inside finishing purposes. It takes a fine polish. The lumber is what is called short leaf or short straw pine. It is free from pitch and is manufactured by hand sawmills, which have taken the place of the old circular-saw. According to statistics obtained from Mr. Fraser, the British Consul, the quantity of lumber received at Baltimore during 1900 amounted to 37,941,350 ft., being an increase of 32,736,350 ft. over 1899. The British Isles were supplied for the greatest customers abroad, and of the 70,277,000 ft. of lumber and logs, and of the 1,046,521 pieces of staves and headings, valued at 547,103*l.*, exported, they took 41,280,000 of the former and 627,147 pieces of the latter, valued at 304,503*l.*, or considerably more than half of the whole exportation. There were exported to Germany lumber, staves, and headings to the value of 88,418*l.*; then came the Netherlands, Belgium, and France; but the value of the exports to the latter country amounted to only some 30,000*l.*

MIDLAND MASTER BUILDERS AND FEDERATION.—A quarterly meeting of the executive of the Midland centre of the National Federation of Building Trades Employers was held on the 19th inst. at the offices, Birmingham, and from the reports submitted from various parts of the Midland counties it would appear that a general depression is being experienced in the building industry. The president (Mr. A. Chambers, Leicester), occupied the chair, and amongst those present were County Alderman Bowen, Messrs. William Sapote, F. G. Whittall, and Albert S. Smith (Birmingham); Mr. E. Fox (Leicester); Messrs. J. Wright, H. Vickers, and F. Hodson (Nottingham); Councillor Green (Northampton), T. Skett and J. Herbert (Wolverhampton), D. Jaleman (Dudley), County Councillor Dallow (Stourbridge), H. Smith (West Bromwich), J. Sherman Wood (Worcester), W. Wistance (Walsall), H. Smith (Kidderminster), &c. A long discussion took place in connection with notices given to or received by workmen in the various branches of the trade at Burton-on-Trent, Coventry, Nuneaton, Newark, Dudley, Kidderminster, Sutton Coldfield, and other places, and it was pointed out that under the conditions generally observed in the trade these notices now expired at a period of the year when work, as a rule, was most plentiful, and consequently the employers, in order to carry out their contracts, were frequently compelled to make concessions that were unjust to themselves and extracted an unreasonable amount from the president remarked that as no body master builders had no desire to act arbitrarily against their workmen, but from experience they were aware that many of the conditions the workmen's trades-unions tried to enforce were detrimental to the best interests of the trade. Mr. J. Wright (Nottingham) said that one of the bugbears of the trade was what was known as the line of demarcation laid down by the trades-unions. Master builders were for the most part practical men, and were fully competent to carry on their business, but in many cases they were not permitted to do so with anything like reasonable freedom. The question was one of great importance to the welfare of the building trade throughout the country, and it behoved the National Federation of Employers to take steps to prevent unjust and meddlesome interference with the masters' common rights. Several speakers took a similar view, and a resolution was passed affirming the necessity for more combined action throughout the kingdom in dealing with disputes in the trade, which too frequently led to strikes and lock-outs. Another point discussed was the desirability for a uniform contract form containing clauses applicable all over the country in relation to such matters as strikes, lock-outs, arbitration, and weather.

ARBITRATION CASE.—At the Surveyors' Institution, Westminster, on the 11th inst., Mr. Arthur Cates sat as umpire to decide the amount of compensation to be paid to Messrs. Metcalf & Greig for land which the Borough Council of Kensington had acquired for the widening of Brompton-road. Mr. R. Vigers was arbitrator for the claimants; and Mr. T. W. Wheeler, the Borough Surveyor, for the Council; Mr. H. E. Duke, K. C., M. P., and Mr. Schiller appeared for the claimants; and Mr. Freeman, K. C., and Mr. Courthope-Munro represented the Kensington Council. Mr. Duke, in opening the case, said that the land was situated on the north side of Brompton-road, between Brompton-square and Cheval-place. The claimants were surveyors and architects of Serjeants'-Inn, and purchased the site in 1880, which was occupied by two old build-

ings, for the purpose of erecting residential flats. The price was 6,500*l.*, of which 1,000*l.* was paid as deposit. When they obtained possession the claimants proceeded to release the site from the dominant lights which prevented the erection of any large building; and in 1890, at some expenditure of time and money, they succeeded in making the building fit for their purpose. At the end of that year they prepared plans which were afterwards duly passed. In February, 1900, they contracted for the erection of the block of flats. The work was proceeded with, and in April they wrote to the vestry of Kensington offering to sell to them a strip of vacant land for the widening of the road. The parties did not agree as to the price, and on April 13 the Vestry Clerk wrote that the vestry proposed to acquire compulsorily half of the site under the powers of Michael Angelo Taylor's Act. The matter was, by an agreement of July 16, 1900, referred to arbitration, and the claimants contended that they were entitled to the sum which the site had undoubtedly cost them and to the profits which they would have realised if the building had been completed. The site was in an exceptionally good position for the erection of flats, and there was every prospect that the scheme would be successful. The learned counsel then called Mr. Andrew Metcalf, architect and surveyor, who said the building proposed was to be of seven floors, with electric light, telephone, and hydraulic lifts. He estimated the rentals of the flats at 3,380*l.*, which would leave a net profit of 2,564*l.* per annum. Their claim was for 46,722*l.*, 23,100*l.* of which was the value of the land, and 23,622*l.* the value of the profits of the undertaking. Mr. Freeman contended that the original plans were not in conformity with the County Council's building regulations, and the witness admitted that was so, but admitted that had been prepared by Mr. H. H. Collins, which he asserted would give the same accommodation and produce the same rental. —At a subsequent hearing the first witness for the Borough Council was Mr. A. R. Stenning, surveyor, who expressed his opinion that the claimants' original plans could not have been carried out, and that the amended plans of Mr. Collins were in many respects open to question. They would in any case require the consent of the London County Council, who might reasonably object that some of the provisions of the Building Act had not been complied with. In his view the best plan for utilising the land would be to provide three shops in Brompton-road, with three floors of residential flats above. The ground-rent of 700*l.* which had been created was an impossible rent and could not be secured by any building which could be erected on the land. The full rent was 315*l.* per annum, which at twenty-five years' purchase and the usual 10 per cent allowance for compulsory sale gave 8,652*l.* He did not admit that there was any other interest, but he considered the claimants were entitled to 1,000*l.* for loss of interest and expenses in connection with the undertaking, and to 650*l.*, the amount paid to the builder for work done. His estimate of the full compensation was 10,312*l.* Mr. A. D. Young, valuer to the London County Council, valued the ground-rent at 300*l.* a year, and the full compensation at 9,000*l.* Mr. Daniel Watney, surveyor, valued the land at 9,350*l.*, on the basis of 2*s.* 6*d.* per foot, and Mr. Snell (Robins, Snell, & Gore) and Mr. Knighton, house agents, gave evidence that the estimated rentals of the proposed flats were very high. The proceedings then closed, the umpire reserving his award.

LYCH GATE, HOLLINGBOURNE, KENT.—A new lych gate was dedicated recently at the parish Church of All Saints at Hollingbourne. The lych gate is constructed of Kentish grown oak, the whole being placed upon a low stone wall. The tympanum in the gables to front and rear are filled with tracery, and the sides are supported respectively by uprights, each separated from one another by pierced and carved tracery. The gabled roof is covered in by oak shingles. The actual gates are double ones in oak, and another gate of similar conception has also been placed as an additional entrance upon the right hand side of the lych gate proper. The work has been carried out by Messrs. Harry Hems & Sons, of Exeter, and the fixing has been superintended by Mr. E. A. Burgess.

CAPITAL AND LABOUR.

THE LONDON BUILDING TRADE.—The Amalgamated Society of Mill Sawyers and Wood-cutting Machinists and the London Labourers' Council have given formal notices to the London Master Builders' Association that the existing codes of working rules with them will terminate on May 1, 1901. In each case the notice was accompanied by a demand for an advance in wages of 3*d.* per hour. These demands have been carefully discussed, and the workmen's representatives have been met in conference thereon, with the result that the Master Builders' Council, considering the present state of the trade, has declined to grant the advances asked for.—The Conciliation Board, duly appointed in accordance with the provisions contained in Rule 10 of the agreement between the London Master Builders' Association and the Amalgamated Society of Carpenters and Joiners, met at 31-2, Bedford-street, Strand, W.C.,

on the 2nd inst. to determine a difference between the Amalgamated Society of Carpenters and Joiners and a member of the London Master Builders' Association, it being alleged that the employer referred to had violated the rule relating to hours of employment by keeping his joiners' shops open sixty hours per week at the ordinary rates of wages. Having heard and considered the statements of the parties concerned, the Conciliation Board unanimously decided:—(1) "We are of opinion that there has been no technical breach of the agreement by the employer." (The shop having been kept open at the request of the workmen. See Rule 3.) (2) "That though this is so, it should not be assumed that the provision in Rule 3, relied on by the employer, is to be construed as a cover for systematic overtime."

ABERDEEN PLASTERERS.—It is now reported that the men and Employers in Aberdeen met privately one night in the end of last week, when it was agreed that the rate of wages should be 8*d.* per hour, and that the operatives should resume work at once. The previous report of the Operatives' Central Executive in Glasgow blocking the proposed compromise seems therefore to be unfounded.

BRADFORD BUILDING TRADE.—Bradford is anticipating a complete stoppage of operations in the building trade on May 1, as a result of a demand by the employers for a reduction of 1*d.* per hour in the wages of masons and joiners. In the case of the masons the employers also ask that an alteration shall be made in the rules, so that union and non-union men shall work one job. After considerable correspondence and meetings, the men have declined, it is stated, the offer of the masters to submit the matter to a arbitration. Except with regard to the refusal to arbitrate, a similar state of things prevails between masters and men in the joinery trade. Other cognate trades sympathise with the men, and a general strike is feared when the intended reductions come into force.

LEGAL.

ERECTING STRUCTURES WITHOUT NOTICE.

At Westminster Police-court, on the 16th inst., several summonses were heard against the occupants of premises in the Victoria district for infringements of the London Building Act by erecting structures without the consent of the London County Council. Mr. Chilvers, who supported the summonses, said they were taken out in reference to stands erected on the day of the funeral of Queen Victoria. Some of the erections were in shop windows, and one on the roof of a house, and he submitted these were structures for which plans should have been approved. The stands were put up at the last moment, and sometimes in a very loose manner, and unless they were submitted to the Council the District Surveyor had no knowledge of where they were.

Fines were imposed varying from 5*s.* and 2*s.* 6*d.* costs to 40*s.* and two guineas costs.

CASE UNDER THE METROPOLIS MANAGEMENT ACTS, 1855 AND 1862.

The case of the Property Exchange Company (No. 1) v. the Wandsworth Board of Works came before a Divisional Court of King's Bench composed of the Lord Chief Justice and Mr. Justice Lawrence on the 17th inst. on appeal by way of special case stated from the order of a Metropolitan Police Magistrate ordering the appellants to pay to the respondents the sum of 60*l.* 11*s.* 3*d.*, the amount of the expenses apportioned to them of paving an alleged new street called Totterdown, Tooting.

It appeared from the special case that Totterdown was a roadway leading out of High-street, Tooting, and ran in an easterly direction. For some years prior to 1885 it was a formed road 16 ft. wide used for wheel and foot traffic, and led into meadows open only to foot passengers. It was a public thoroughfare, and has been repaired since 1855 by the Board. On the south side of the roadway is a row of houses which have been built about seventy-five years. In 1808 the roadway was widened to 40 ft., and a new street known as St. Cyprian-street was made running into Totterdown from the north, and the lands on the north side of Totterdown were laid out for building. The premises or walls now on the north side of Totterdown are the flanking wall of the premises owned by the appellants, known as No. 20, St. Cyprian-street, the flanking wall of No. 28, St. Cyprian-street, a yard and premises belonging to the London General Omnibus Company opening into Totterdown, a passage entrance to the rear of houses in High-street, and the flanking wall of premises facing High-street, and having a side entrance in Totterdown. The Board resolved in April, 1889, to pave Totterdown from High-street to a point 310 ft. east, and to charge the expenses upon owners of property abutting thereon. The owner of the houses on the south side resisted the apportionment, and the summons issued against him was dismissed on the ground that the southern side of Totterdown was an old street, and that it therefore could not be treated as a new street. The Board

then passed a fresh resolution, ordering that "a certain new street situate and being Totterdown on the north side thereof" be paved so as to make it conform to the adjoining part of the existing carriage-way, and that the estimated expenses of such paving be apportioned and charged on the owners of the houses forming and the land bounding or abutting on such new street. Under this resolution the expenses were apportioned among the owners of property on the north side of Totterdown only. The appellants contended that the portion of Totterdown proposed to be adopted was not a new street within Section 105 of the Metropolis Management Act, 1855, and Sections 77 and 112 of the Metropolis Management Act Amendment Act, 1862, and that the resolution of the Board was invalid and further that the apportionment was bad, as the owners on the south side of the roadway were not made contributory. The magistrate held that the portion of the roadway ordered to be paved was a new street and that the resolution and apportionment were valid.

After hearing the arguments of counsel, their lordships affirmed the decision of the magistrate and dismissed the appeal.

Mr. Richards appealed for the appellants, and Mr. Mattinson, K.C., and Mr. J. C. Earle for the respondents.

WORKMEN'S COMPENSATION ACT.

WHAT IS AN "ACCIDENT" ?

AT Marylebone County Court, Friday last week, before Judge Stonor, Richard Perry, carpenter and joiner, Napier-road, College-park, N.W., brought an action, under the Workmen's Compensation Act, against Messrs. Baker and Sons, High-road, Willesden-green, N.W., the claim being in respect of personal injuries said to have been sustained by the applicant whilst in the respondents' employ. Mr. A. H. D. Nonweiler, solicitor, appeared for the applicant, and Mr. W. Berryman, solicitor, for the respondents.

The applicant's case, briefly, was as follows: For about three years he had been in the employ of the respondents, his average weekly earnings being 2*l.* 4*s.* 8*d.* On September 18 last he was ordered by the foreman to make a large, heavy seat. While lifting the piece of work, to see a joint underneath, he strained a muscle in the side of his abdomen. In consequence of the injury he was confined to his bedroom for about five months, and still felt great pain and experienced difficulty in walking. Two medical men, called on behalf of the applicant, expressed an opinion that the man's nervous system was seriously affected by the injury.

A medical man, called by the respondents, said that during the whole course of his experience in the profession, extending over some twenty years, he had never heard of such a thing as a muscular strain causing shock to the nervous system. He considered that the man was not now suffering from the injuries sustained in September.

Edwin Prestige, the respondents' foreman, stated that he told off a lad to assist in moving the seat in question, and directed the applicant not to attempt to lift such a heavy thing himself. The applicant, recalled, denied that the foreman had told him not to attempt to lift the seat without assistance, and added that he heard nothing, until after he had injured himself, about a lad being told off to assist him.

The chief point of law raised by the solicitor for the respondents was that there had been no "accident" within the meaning of the Act. He referred particularly to the case "*Roper v. Greenwood*," 83 *Times* Law Reports, 100, in which it was held that an accident was the occurrence of "something unexpected and fortuitous."

The Judge: Nothing unusual appears to have occurred as regards the work itself, and it is difficult, therefore, to see how there could have been an accident.

Mr. Nonweiler: According to their own showing, there was something unusual in the work, for they say that they told off some one to assist in lifting the seat.

The Judge: I will consider the point. The case must be adjourned.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

25,353.—AN ELECTRICAL RESISTANCE: *E. F. Moy, P. H. Basile, and E. F. Moy, Limited.*—Within an exterior container which holds the liquid resistance is suspended an earthenware insulating tube, and a tubular leaden electrode which is cast integrally above a conical electrode which is cast integrally with a connecting strip, which is passed between the container and the insulating tube (through a slot in the flange of the latter) and is fitted with a terminal; the electrode is cast in one piece with a bridge and a connecting bar enclosing a brass strengthening rod and having an insulating pulley and a terminal.

25,384.—CANS, &c.: *W. Jones and J. Roberts.*—On to the neck of the can is hinged a funnel that under normal conditions will remain inverted over the neck, but when the can is being used for, say, filling

purposes, it is tilted on the hinge so as to turn the neck of the can into the funnel.

25,417.—ELECTROMAGNETS: *L. J. Delacaux.*—The inventor provides a movable armature or core having a long play for a sheathed electro-magnet, and makes the casing or sheath in one piece or more with a rounded opening at each end, a bobbin or reel wound with insulated wire being held within. A hollow cylinder or a solid shaft of soft iron constitutes the armature or core at one end or at both ends of which is a series of discs or washers, which may be made with varying cross-sections or diameters, and he set apart at different intervals.

25,450.—AN APPLIANCE FOR USE WITH HOISTS, LIFTS, &c.: *G. M. Brenner.*—The inventor seeks to prevent an accidental running down of the load. The self-sustaining appliance comprises a containing-box, across which is the power-shaft, from which project diagonally two arms for engagement with jugs upon loose discs; the annular rim of one of the discs takes rollers in recesses which are cut in it. Four flats are cut upon the other disc, whereby no jamming action will arise when the load is being lifted, but when the power is removed, the load as it starts to fall turns the latter disc a little with respect to the former disc, whereupon the consequent jamming of the rollers against the casing locks the latter disc and so holds up the load.

25,512.—TREATMENT OF LIME, HYDRAULIC CEMENTS, &c.: *Soc. J. et A. Parin de Lafarge.*—The wetted lumps of lime or cement are passed from a hopper into a rotating receiver having a steam-jacket. A slow movement of the material along the receiver is imparted with mutilated helices, whilst it is shaken and crumbled with ribs set lengthwise. It is then similarly treated in other cylinders, between which is put a reheating chamber, fitted with a continuous coil of steam pipes, in some instances the slaked hody should be kept for from twenty-four to forty-eight hours at 100 deg. C. in a pit surrounded with some non-conducting material.

25,518.—TAPS AND COCKS: *M. L. T. E. Vaïsse.*—Upon the end of the screw-threaded rod or working spindle is a collar from which hangs a socket into which the plug is screwed; the lower portion of the plug is kept in constant engagement with the seat in the valve, and another plug can be easily substituted.

25,526.—WALL, CEILING, AND SIMILAR COVERINGS: *Soc. Joss et Fils et Compagnie.*—An acid and weather-proof covering for walls, ceilings, and so on, is formed of paper, textile fabric, cloth, or other material by first steeping it in a solution composed of gutta-percha dissolved in an essential oil, 1 part; mineral pitch similarly dissolved, 1 part; Venice turpentine, 1 part; and a liquid dryer, 3 parts. Then it is dried and coated upon both sides with white lead that has been pounded up together with a drying oil that contains one-tenth part of liquid gutta-percha; to the material, having been dried again, is applied upon one side a coating of zinc white ground in clear linseed oil and copal varnish. It may then be impressed ornamentally and be secured in its position with a liquid cement composed of white lead, linseed oil, and a dryer containing one-twentieth part of liquid gutta-percha or some similar substance.

25,540.—MECHANISM FOR USE IN MOULDING BRICKS: *T. C. Fawcett, Limited, and J. D. Fawcett.*—For working the cutting-table of an extrusion-machine the inventors hinge a stop-piece on to the outer end of the table and join the stop-piece, with a rod and a bell-crank lever, to a weighted sliding rod that is disposed so as to engage with a stop and a fixed cam. As the stream of clay flows against the hinged stop-piece the sliding rod becomes lifted clear of the last-named stop, and the table is then moved together with the clay. With the forward movement of the table a lever attached thereto is passed clear of a cam, whilst a weighted lever that reposes upon the former lever falls down upon a clutch, which it puts into action to shift the table sideways. The clay is then cut up into bricks, and the table is next moved lengthwise at a speed faster than that of the clay by means of a second cam operated by the clutch. The cam is rotated beneath the lever of the table upon the return stroke of the latter; a roller of the sliding-rod begins to run upon the cam when the outward stroke of the table is finished, so that the hinged stop-piece shall be diverted outwards and clear of the end brick. In another form the motion of the table may be communicated by the band, the automatic clutch mechanism being in that case disconnected from the machine.

25,541.—OVERFLOW OPENINGS FOR BATHS, SINKS, URINALS, CLOSET AND OTHER BASINS, AND SIMILAR PURPOSES: *J. Jarvis.*—In order that the overflow openings may be protected and hidden from sight is devised a hanging lip which is fashioned out of the detachable part of the mould of plaster of Paris upon which the articles named are formed.

25,584.—PILES FOR THE BANKS OF RIVERS: *W. Baudisch.*—After the piles have been driven into the bank or bed of the river, their tops are cut off evenly, beams are then placed over the piles, vertical iron rods or tubes are thrust into holes bored through the beams into the piles, and a concrete wall is then constructed upon the beams about and around the vertical rods. When the work is done in part under water, stone foundation blocks should be interposed amongst the piles as high as

the level of the water, and grooves should be cut at the ends of the blocks to form means of hold-fast with the piles.

25,594.—A PROCESS OF ORNAMENTAL METAL ENLAY: *F. Eppler.*—For inlaying metals in marble, granite, syenite, or other materials by electro-deposition, and for filling, surfacing, chasing, and engraving purposes, the inventor fashions recesses in the metal by sand-blasting. The recesses may be undercut, or inclined holes may be made beneath them for the deposited metal, or metal pins of brass or copper or silver, gold, or platinum is to be deposited. When the recesses are wide, pieces of fine gauze should be pressed into them, and continuous metal wires which have been threaded through the holes or placed within the recesses may be brought up to the surface of the metal deposited. In order to render the surfaces conductive they should be chemically silvered or be rubbed with some soft metal, such as zinc, tin, or aluminium.

25,621.—ELECTRICAL SWITCHES FOR DOMESTIC USE: *A. P. Lundberg and G. C. Lundberg.*—The appliance concerns two-way and similar switches which are devised especially for regulating an installation from two points, as, for instance, in the lighting of staircases, and so on; for a two-way switch having a quick make and break the inventors apply on to the base three terminals provided with spring contacts, and mount a moving contact loosely upon a spindle, four pins are passed through that will engage underneath with a pair of flattened springs so as to effect a quick break and will engage above with a spring of which the projecting ends fit into recesses in the handle and thereby ensure a spring connexion.

25,646.—CHIMNEY TOPS, &c.: *W. B. Ramsey, C. Davies, and J. Leese.*—A chimney for the top of a chimney or a ventilating shaft is made in the shape of a truncated pyramid, square on base, in each side of which is made an opening over which are hung two pairs of shutters mounted at right angles upon two rocking beams.

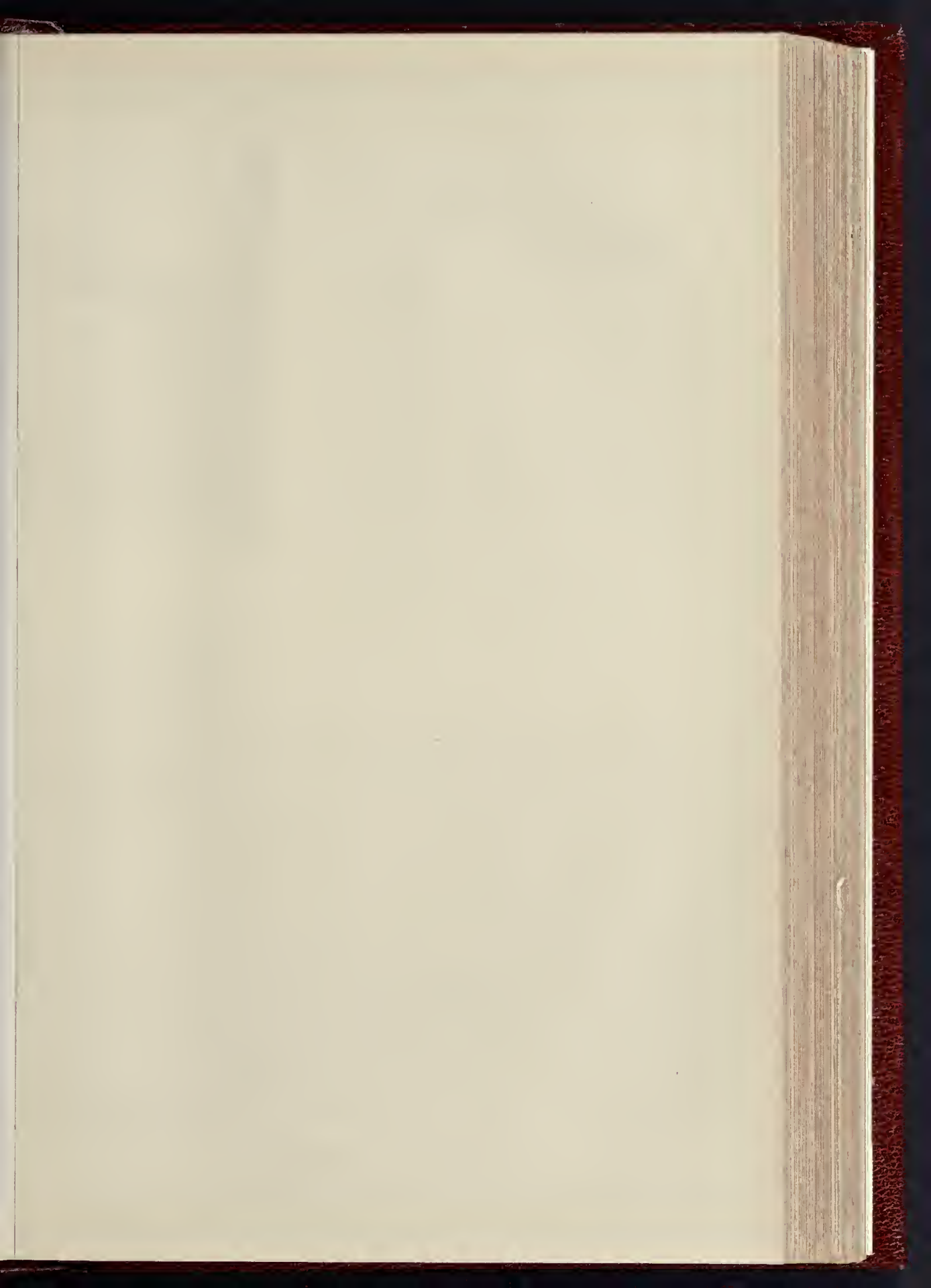
25,681.—AN APPLIANCE FOR AN ELECTRICITY ENERGY METER: *Algemeine Electricitäts G.*—The electro-dynamometer is intended to be used with an alternating current. In the space surrounded by a horizontally laminated iron block is fixed a set of coils around a separate and movable coil mounted upon a vertical axle fitted with a pointer, the movement being damped by means of a metal plate within the fields of two permanent magnets. Under that arrangement the outer portions of the magnetical circle of the fixed set of coils exert no influence upon the permanent magnets, since they rest within the iron block.

25,716.—CRAMPS: *Dodd Kimbley & Sons' Tool Manufacturing Co. and W. Kimbley.*—The invention relates to cramps for flooring and other cramps. Projections are made upon the head of the tool in order that as they lie upon the top of the flooring-board or other work, they shall serve to maintain the cramp and the board together in their relatively proper places.

25,723.—EXTENSIBLE LADDERS: *S. Deau.*—Two sections whose widths are equal constitute an extensible ladder, and are so fitted together that the upper section will slide in grooves or brackets upon the lower section, and will be sustained at the height desired by means of brackets upon a shaft which is turned and regulated by means of a pulley and an endless cord, the movement of the shaft being limited in its extent by projections from the brackets which are pressed against the sides of the lower section. To the ends of the two sections is attached a lifting-cord that is passed around a pulley upon the lower section. A spring (to be liberated with a cord) may be employed for holding up the sustaining brackets automatically when they are in action, and a crossbar provided with collars and rollers may be adopted for holding the upper section in its place.

25,734.—ARTIFICIAL STONE FOR BUILDERS' USE: *P. Timofeff.*—The invention comprises the manufacture of artificial stone for building and paving blocks and slabs and similar goods, and the manufacture of a cement for uniting the blocks and slabs together; the component materials consist of limestone, clay, brick, stone, and rubbish, mixed with fluxes, alkalies or alkaline earths, limes, oxides, mineral colouring substances and so on, all finely pulverised and melted at a high temperature in furnaces. The moulded blocks are then annealed in the same manner as glass is. For a cement is made an admixture of lime and calcium silicate, or a pulverised artificial stone mixed with ordinary cement. If very hard goods are needed a part of quartz sand is thrown into the molten compound just before it is cast.

25,741.—A LIGHTNING ARRESTER: *A. J. Wurts.* A common spark block is secured to divided spark blocks with wooden strips set with their grain at a right angle to the spark block, and charred grooves are made between the blocks. Sockets of the spark blocks carry resistance rods (composed of a dried mixture of starch, graphite, and kaolin), are socketed at their remote ends in an earth plate, and each of them is partially covered with rough paper wetted and lined with shellac or some other adhesive substance. With the specification should be read the United States specifications Nos. 509, 783-4 of 1893.





NASSAU HOUSE.



FRONT



BATH STREET COLONNADE.



GRA



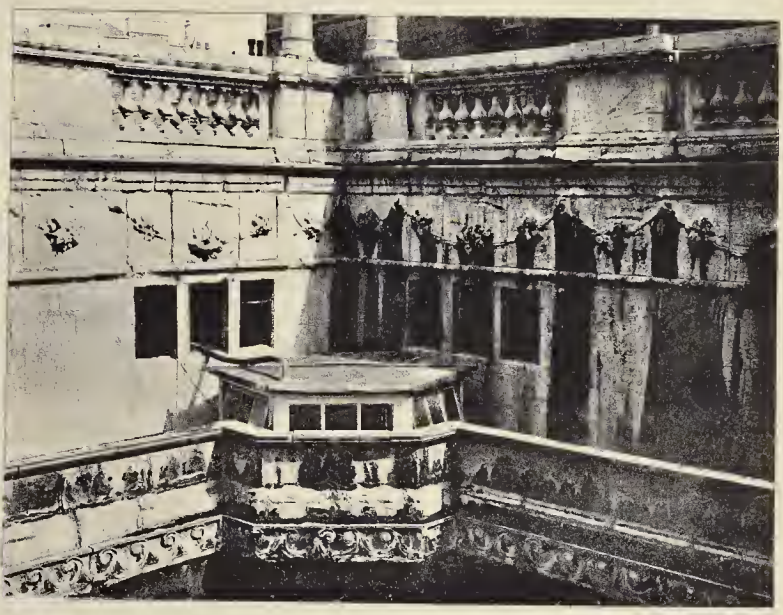
EMP-ROOM.



DOORWAY IN ALFRED STREET.

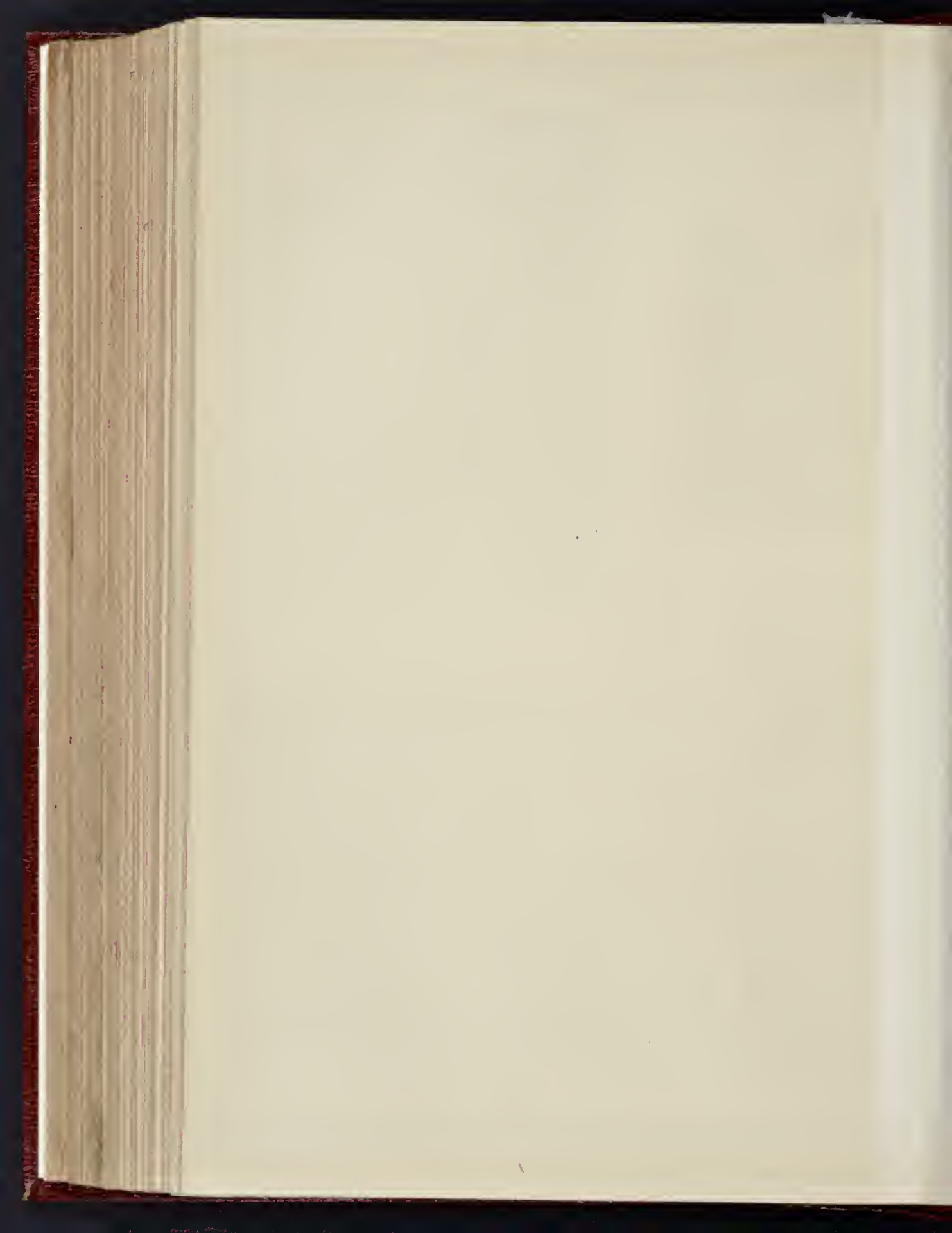


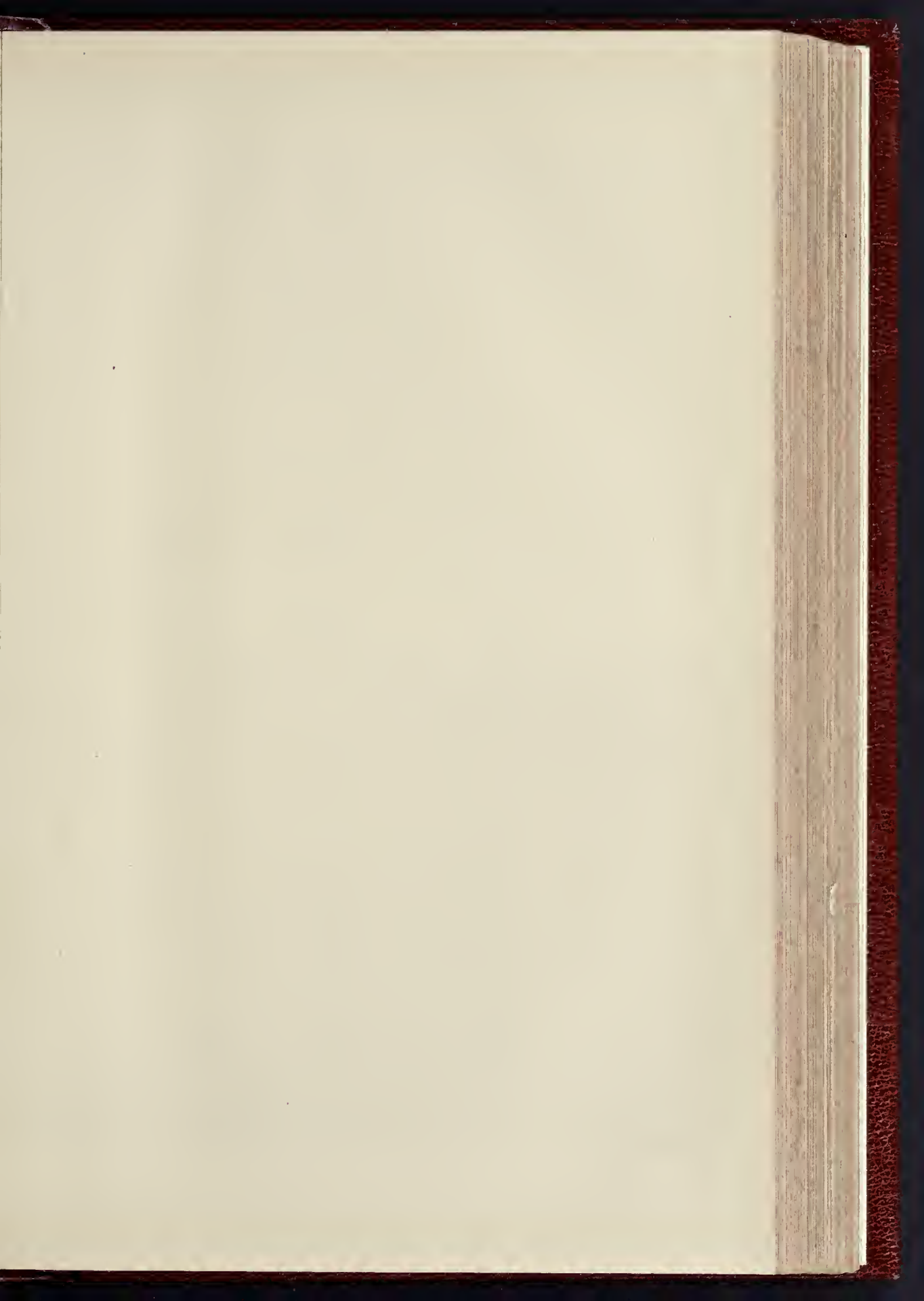
SCHOOL.



LEPERS' BATH.

INK-PHOTO, SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.





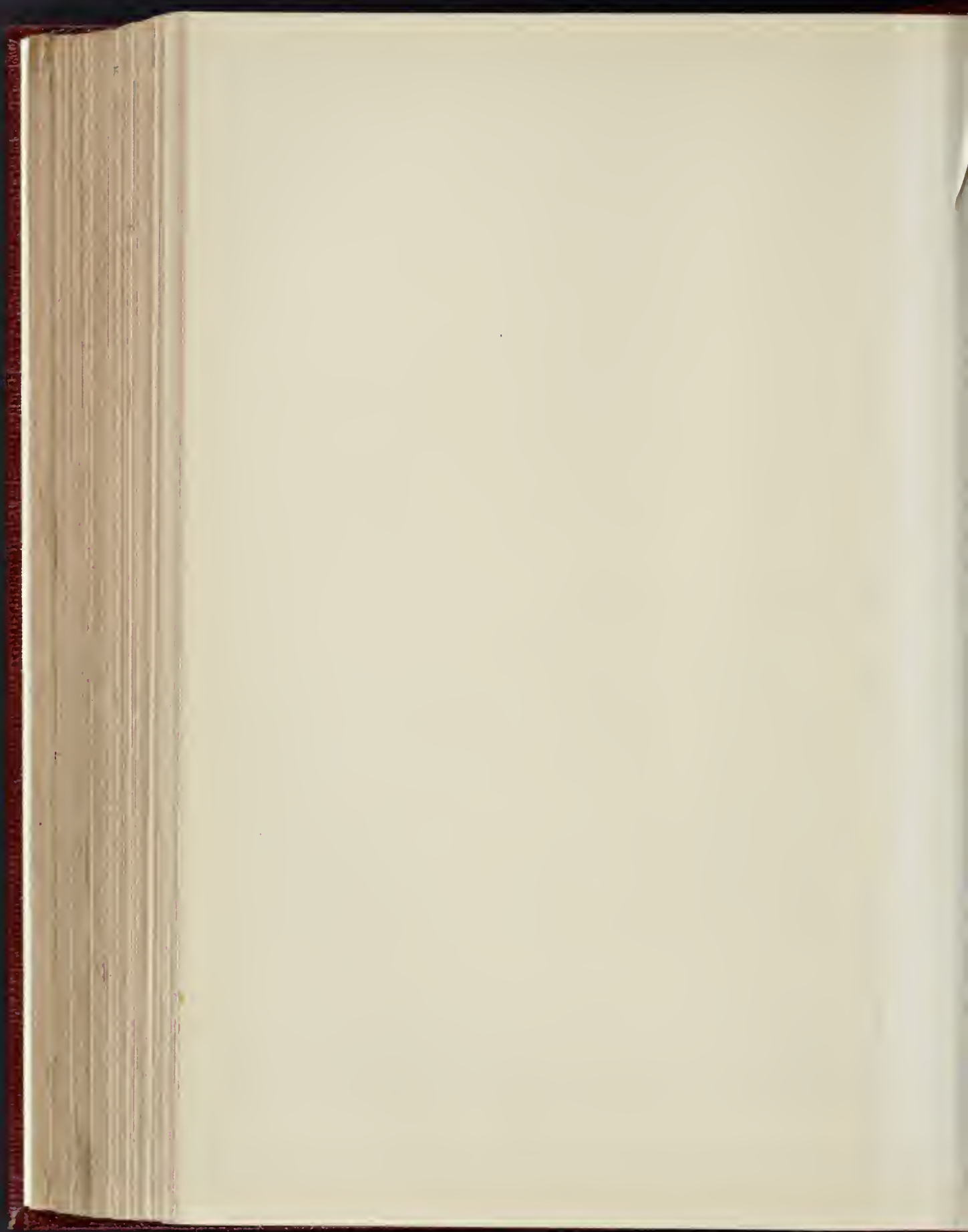


COMPETITION DESIGN FOR NEW BUILDING FOR NORWICH



INK-PHOTO, SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

LIFE INSURANCE SOCIETY.—BY MR. C. H. HEATHCOTE, F.R.I.B.A.



25,768. — CONTRIVANCES (ELECTRICAL) FOR LIFTS. H. Rowntree.—Electricity is employed as a motive power. At every landing is a push-button, and in the cage is a corresponding push-button, for regulating a circuit which embraces a magnetical switch; every switch regulates a circuit which embraces either the one or the other of two solenoids, and every solenoid circuit embraces a contrivance for making contact, which will be automatically broken upon the arrival of the cage at the landing which corresponds with the particular button that is manipulated, and will automatically reduce the speed of the motor with the approach of the cage to the landing where its arrest is desired. The various objects of the invention comprise the impossibility of bringing the lifting apparatus into play until all the well doors shall have been shut, the automatic arrest of the cage at any particular landing (together with its movement to that landing) by means of the working of a push-button at the landing or in the cage, the regulation of all the movements of the cage by push-buttons in the cage as well as at the landings, and the automatic regulation of the motion of the cage when it is started and stopped.

MEETINGS.

FRIDAY, APRIL 26.

Society of Arts (Howard Lectures).—Mr. Alfred C. Eboral on "Polyphase Electric Working." I. 8 p.m. Glasgow Architectural Craftsmen's Society.—Business meeting. 8 p.m. Building Trades' Exhibition.—Conference on standardising of bricks. 4 p.m.

SATURDAY, APRIL 27.

St. Paul's Ecclesiastical Society.—Visits to the churches of St. Mary, Willesden, and St. Andrew, Willesden Green. Members meet at St. Mary (the old Parish Church) at 3 p.m. Builders' Association (Memorial Hall, Farringdon-street).—Quarterly meeting. 7.30 p.m. Northern Architectural Association.—Excursion meeting. Members to assemble at the south end of Sunderland Central Station at 3.5 p.m.

MONDAY, APRIL 29.

Royal Institute of British Architects.—Special General Meeting to consider various resolutions as to the competition for the proposed national observatory to Queen Victoria. 8 p.m. Society of Arts (Howard Lectures).—Mr. A. Clavell Salter on "The Ownership of the Highways." 8 p.m. Society of Arts (Howard Lectures).—Sir William Chandler Roberts-Austen on "Alloys." II. 8 p.m.

WEDNESDAY, MAY 1.

Royal Archaeological Institute.—(a) Mr. A. R. Whitehead, M.A., on "The Pyrenean Neighbour or the Vicinal System in the Western Pyrenees." (b) Mr. H. Longden on "Cast Iron." 4 p.m. British Archaeological Association.—Annual general meeting. A paper by Mr. T. Cato Worsfold upon "The Porta Nigra, a Treasure of Treves." 4.30 p.m. Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the members. 8 p.m. Edinburgh Architectural Association.—Annual business meeting and President's valedictory address. 8 p.m.

THURSDAY, MAY 2.

Institution of Electrical Engineers (at the Institution of Civil Engineers).—(1) Messrs. C. G. Lamb, M.A., B.Sc., and Miles Walker, B.A., on "An Instrument for Measuring the Permeability of Iron and Steel," and (2) Mr. Frank Holden on "A Watt-Hour Meter." 8 p.m. Society for the Encouragement of the Fine Arts.—Mr. Ernest Hunt on "Stencil Painting as an Art." Illustrations. 8 p.m. Civil and Mechanical Engineers' Society.—Mr. A. H. Allen on "The Storage of Electricity." 8 p.m. Carpenters' Company Lecturers (at the Carpenters and Joiners).—Mr. James Bartlett on "Timber Framing." 7.30 p.m.

FRIDAY, MAY 3.

Architectural Association Discussion Section.—Mr. E. Greenup on "The Ethics of Professional Advertising." 7 p.m. Institution of Junior Engineers (Westminster Palace Hotel).—The Northcott prize paper on "How may the best efforts of Employers and Employed be exerted for their mutual advantage and for the National Benefit?" by Mr. William Powrie, will be read and discussed. 8 p.m. Society of Arts (Howard Lectures).—Mr. Alfred C. Eboral on "Polyphase Electric Working." II. 8 p.m.

SATURDAY, MAY 4.

Architectural Association.—Visit to Newgate Gaol. Edinburgh Architectural Association.—Geological ramble in Queen's Park.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

Table listing property sales including Milton, Oxon., Berkhamstead, and Stamford Hill, with prices ranging from £1,100 to £5,100.

Main table of property listings with columns for address, area, and price. Includes listings for Stoke Newington, Manor Park, Putney, Edmonton, Fairfield, Margate, Hackney, Walthamstow, and various other districts.

Table of property listings including Highbury, Pimlico, Holloway, Homerton, Paddington, Notting Hill, Hampstead, Bournemouth, and Kentish Town.

PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quantities and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Detailed price list for building materials including bricks, stones, and various types of bricks and slates, with prices per 1,000 or per yard.

[See also page 429.]

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.			
Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Schools	Aldershot School Board	See Advertisement	May 27
*Fire Station, &c.	Manchester Corporation	300L, 200L and 100L	July 31

CONTRACTS.			
Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Specified by	Tenders to be delivered
Road Metal, &c.	Uckfield (Sussex) U.D.C.	C. Dawson, Council Offices, Uckfield	April 29
Coventry Corporation	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Soldiers' Home, Tipperary	Grimshy Corporation	W. H. Hill & Son, Architects, 25, South-mall, Cork	do.
Alterations to Offices, Connamore-road	Harrogate Corporation	H. J. Hyatt, Civil Engineer, Town Hall-square, Grimsby	do.
Street Works, Victoria-road and others	Littlehampton Gas Co., Ltd.	Borough Surveyor, Town Hall, Harrogate	do.
Oas Main Pipes	Newbiggin Co-operative Society	A. W. Elton, Engineer, Littlehampton	do.
Street Works, Jackson-street, Stretford, Manchester	Ware Guardians	J. Bowden, Civil Engineer, 14, Ridgefield, Manchester	do.
Stabling, &c.	Witham (Essex) U.D.C.	Booth & Hardy, Architects, Morgan	do.
Broken Granite Road Metal	Banbury Town Council	O. H. Olby, Town Hall, Ware	do.
Wall, &c., St. Andrew's Churchyard, Norwich	Aberdeen Town Council	A. E. Collins, Civil Engineer, Outdiall, Norwich	do.
Boiler House, &c., Roxburgh District Asylum, Melrose	Belfast Corporation	Mitchell & Wilson, Architects, 13, Young-street, Edinburgh	do.
Chimney Stack, &c., Roxburgh District Asylum, Melrose	Sewerage Works, &c., Heaton Mersey	W. H. Perkins, Surveyor, District Council Offices, Witham	do.
Sewerage Works, &c., Heaton Mersey	Drainage Works	N. H. Dawson, Civil Engineer, Banbury	do.
Restoration of Methodist Chapel, Featherstone	Purifying House	A. Smith, Engineer, 2, Broad-street, Aberdeen	do.
Walls, &c., at Cemetery	Public Offices, &c., Hare-lane	City Surveyor, Town Hall, Belfast	do.
Electricity Works, Dee Village	Lining Reservoir, Hogshaw	B. H. Orives, Town Surveyor, Town Hall, Buxton	do.
Sewer along River Lagan	Paving Works, &c.	J. Semmons, 16, Museum-street, Ipswich	do.
Drainage Works	Stone Road Metal	E. Tretwey, Gas Offices, Keyham, Devonport	April 30
Purifying House	Paving Works, Partington-street	T. J. Trowdale, Surveyor, Council Offices, Anfield Plain	do.
Public Offices, &c., Hare-lane	Lining Reservoir, Hogshaw	W. H. Fearnley, Architect, Station-lane, Featherstone	do.
Restoration of Methodist Chapel, Featherstone	Paving Works, &c.	L. C. Evans, Town Hall, Salford	do.
Walls, &c., at Cemetery	Stone Road Metal	J. Oriffiths, Surveyor, Porth House, Porth	do.
Electricity Works, Dee Village	Paving Works, Partington-street	S. S. Platt, Civil Engineer, Town Hall, Rochdale	do.
Sewer along River Lagan	Lining Reservoir, Hogshaw	W. Harton, Surveyor, High-street, Darford	do.
Drainage Works	Paving Works, &c.	J. Griffiths, Council Offices, Neyland	do.
Purifying House	Stone Road Metal	T. Kidd, Surveyor, Coppice Side, Swadincote	do.
Public Offices, &c., Hare-lane	Paving Works, Partington-street	J. H. Taylor, Architect, 15, Grove-street, Kearsley, Farnworth	do.
Restoration of Methodist Chapel, Featherstone	Lining Reservoir, Hogshaw	L. J. Falconer, Architects, 27, Bank-buildings, Blaingowrie	do.
Walls, &c., at Cemetery	Paving Works, &c.	A. Clynne, Architect, 123, Union-street, Aberdeen	do.
Electricity Works, Dee Village	Stone Road Metal	Fairbank & Son, Civil Engineers, 18, Leudal, York	May 1
Sewer along River Lagan	Paving Works, Partington-street	J. W. Bradley, Civil Engineer, Town Hall, Wolverhampton	do.
Drainage Works	Lining Reservoir, Hogshaw	R. Collins, Surveyor, Court House, Enfield	do.
Purifying House	Stone Road Metal	E. M. McIvor, Architect, Carlton-street, Cleford	do.
Public Offices, &c., Hare-lane	Paving Works, &c.	J. P. Bestlow, Engineer, Union Offices, Chesterfield	do.
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	Town Clerk, Municipal-buildings, Lavender-hill, S.W.	May 2
Walls, &c., at Cemetery	Paving Works, Partington-street	D. M. Robbs, Council Offices, Oalsborough	do.
Electricity Works, Dee Village	Lining Reservoir, Hogshaw	M. Hall, Architect, 29, Northgate, Halifax	do.
Sewer along River Lagan	Paving Works, &c.	J. Boyd, Town Hall, Carrickfergus	do.
Drainage Works	Stone Road Metal	G. E. Beaumont, Engineer, Workhouse, Orenoside, near Sheffield	do.
Purifying House	Paving Works, Partington-street	E. Martlew, 14, Newton-road, Billinge	do.
Public Offices, &c., Hare-lane	Lining Reservoir, Hogshaw	J. Ranshaw, Architect, Brillington	do.
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	W. Burton, Surveyor, Billingham	May 3
Walls, &c., at Cemetery	Paving Works, &c.	J. H. Brierley, Borough Engineer, Town Hall, Richmond	do.
Electricity Works, Dee Village	Stone Road Metal	P. J. Sheldon, Civil Engineer, County Offices, Chelmsford	do.
Sewer along River Lagan	Paving Works, Partington-street	J. Boyd, Town Hall, Carrickfergus	May 1
Drainage Works	Lining Reservoir, Hogshaw	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Purifying House	Stone Road Metal	C. Creatore, Surveyor, Council Offices, Alvaston	do.
Public Offices, &c., Hare-lane	Paving Works, &c.	J. Scott, Town Offices, Coldstream	do.
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	J. Grant, 48, Blyth-street, Ferry Main	do.
Walls, &c., at Cemetery	Paving Works, Partington-street	J. Binley, Engineer, 7, Lowther-street, Kendal	do.
Electricity Works, Dee Village	Lining Reservoir, Hogshaw	Borough Surveyor, Town Hall, Rosebery-avenue, E.C.	May 6
Sewer along River Lagan	Paving Works, &c.	C. E. Wardlaw, Civil Engineer, 112, Bath-street, Glasgow	do.
Drainage Works	Stone Road Metal	City Surveyor, Town Hall, Ripon	do.
Purifying House	Paving Works, Partington-street	L. J. Veal, Surveyor, Council Offices, Chapel-street, Goole	do.
Public Offices, &c., Hare-lane	Lining Reservoir, Hogshaw	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	J. Marsh, Council-chambers, Shanklin	do.
Walls, &c., at Cemetery	Paving Works, &c.	A. H. Prescott, 712, High-street, Tottenham	May 7
Electricity Works, Dee Village	Stone Road Metal	T. Jenkins, Architect, 35, High-street, Burton-on-Trent	May 8
Sewer along River Lagan	Paving Works, Partington-street	Borough Surveyor, Town Hall, Brighton	May 9
Drainage Works	Lining Reservoir, Hogshaw	J. Parker, Civil Engineer, 14, Nelson-street, Hereford	do.
Purifying House	Stone Road Metal	W. Wyke, Engineer, 99, Railford-road, Leamington	May 13
Public Offices, &c., Hare-lane	Paving Works, &c.	Officers, 33, Bath-street, Abingdon	May 14
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	H. T. Hare, Architect, 13, Hart-street, Bloomsbury, W.C.	May 15
Walls, &c., at Cemetery	Paving Works, Partington-street	do.	do.
Electricity Works, Dee Village	Lining Reservoir, Hogshaw	See Advertisement	do.
Sewer along River Lagan	Paving Works, &c.	Beeley, Son & Nichol, Engineers, 14, Victoria-road, Westminster	do.
Drainage Works	Stone Road Metal	Architect's Department, County Hall, Spring-gardens, S.W.	May 17
Purifying House	Paving Works, Partington-street	Clerk, School Board Offices, East Ham, E.C.	May 29
Public Offices, &c., Hare-lane	Lining Reservoir, Hogshaw	See Advertisement	May 22
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	J. Laidis, Architect, 7, Douglas-street, Broughborough, W.C.	No date
Walls, &c., at Cemetery	Paving Works, &c.	See Advertisement	do.
Electricity Works, Dee Village	Stone Road Metal	John Rutherford, County Hotel, Jarrow	do.
Sewer along River Lagan	Paving Works, Partington-street	Sands & Walker, Architects, Angel-road, Nottingham	do.
Drainage Works	Lining Reservoir, Hogshaw	A. S. St. John, Architect, 45, Finbury-pavement, E.C.	do.
Purifying House	Stone Road Metal	J. Gibson, Engineer, Birnmore	do.
Public Offices, &c., Hare-lane	Paving Works, &c.	J. B. Broadbent, Architect, 15, Cooper-street, Manchester	do.
Restoration of Methodist Chapel, Featherstone	Stone Road Metal	G. Moxham, Architect, 39, Castle-street, Swansea	do.
Walls, &c., at Cemetery	Paving Works, Partington-street	W. Lewis, Architects, 7, Wellington-street, Warrington	do.
Electricity Works, Dee Village	Lining Reservoir, Hogshaw	A. Thompson, Architect, Wash, near Bournemouth	do.
Sewer along River Lagan	Paving Works, &c.	Mr. Powell, 4, King-street, Wakefield	do.
Drainage Works	Stone Road Metal	J. Hudson, Penrith	do.

[See also next page.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Application to be in. Includes Clerk of Works, Lecturer, and various council appointments.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.

PRICES CURRENT (Continued).

Table of TILES prices: Best plain red roofing tiles, Hip and valley tiles, Best Broseley tiles, etc.

WOOD.

Table of BUILDING WOOD—YELLOW: Deals, Battens, Fir timber, Second yellow deals, etc.

JOINERS' WOOD.

Table of White Sea, First yellow deals, Battens, Second yellow deals, etc.

OILS, &c.

Table of Raw Linseed Oil, Boiled Oil, Turpentine, Genuine Ground English White Lead, etc.

VARNISHES, &c.

Table of Fine Elastic Copal Varnish, Best Elastic Carriage Varnish, Best Hard Copal Varnish, etc.

JOISTS, GIRDERS, &c.

Table of Rolled Steel Joists, Compound Girders, Angles, Tees and Channels, etc.

PRICES CURRENT (Continued).

Table of METALS: Iron, Common Bars, Staffordshire Crown Bars, Mild Steel Bars, Hoop Iron, Sheet Iron, Galvanised flat, etc.

LEAD—Sheet, English, 3 lbs. & up.

Table of Zinc—Sheet, Vieille Montagne, Silesian.

COPPER—

Table of Strong Sheet, Thin, Copper nails.

BRASS—

Table of Strong Sheet, Thin.

TIN—English Ingots.

SOLDER—Plumbers'.

Table of Blowpipe.

ENGLISH SHEET GLASS IN CRATES.

Table of 15 oz. thirds, 21 oz. thirds, 25 oz. thirds, 32 oz. thirds, Fluted sheet, etc.

Hartley's Rolled Plate.

Table of 1/2 inch, 3/4 inch, 1 inch.

TO CORRESPONDENTS.

G. E. S.—W. R. (Below our limit). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

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

BRIDLINGTON.—For the erection of stables, &c., for Mr. J. Burrell. Mr. J. Earnshaw, architect, Wellington-road, Bridlington:— W. Barnes £1,575 0 0 T. Atkin £1,345 W. Corner £1,475 10 0 T. Spink £1,324 E. Wilson £1,400 14 0 Blackburn & Son £1,274 10 0 Sampson & Liddall £1,359 3 1 [All of Bridlington.]

BURSLEM.—For work at Messrs. Keeling & Co.'s works, Burslem. Messrs. Scrivener, architect, Hanley:— Bennetts £370 Grant & Son £710 Cope £740 Longden £709 Cooke £749 Godwin £674 Ellis £745

CARNARVON.—For new villa at Priestley-road, Carnarvon, for Mr. A. W. Kay Menzies. Mr. R. L. Jones, architect, Carnarvon:— Williams & Roberts £2,575 0 0 Jones, Roberts, & Jones Pwllheli, Carnarvon-shire £2,267 17 6

CARNARVON.—For new villas (semi-detached) at the corner of St. David's and Warfield roads, Carnarvon, for the Committee of Castle-street English Wesleyan Chapel, Carnarvon. Mr. R. L. Jones, architect, Carnarvon:— Jones, Roberts, & Jones £2,252 0 0 Williams & Roberts £1,380 0 0 Richard Jones £1,802 14 9 Williams £1,470 0 0 Edward Parry £1,782 0 0 Jones Bros. £1,750 0 0

CARNARVON.—For the erection of a new C.M. Chapel at Tanycoed, Llanrug, near Carnarvon, for the Committee of Tanycoed C.M. Chapel, Llanrug. Mr. R. L. Jones, architect, 14, Market-street, Carnarvon:— H. Hughes £1,160 0 0 O. Williams £1,083 0 0 Williams & Roberts £1,099 0 0 R. Jones, Llanwnda, near Carnarvon £1,059 8 4

CASTLEFORD (Works).—For the erection of park lodge, for the Urban District Council. Mr. W. Green, Surveyor, Council Offices, Castleford:— Building—Gallagher Bros., Castleford £170 Joinery, &c.—Perry & Sons, Allerton Bywater £79 Plastering—Fred. Beighton, Castleford £12 Painting—M. H. Watson, Castleford £5

GROESLON DINAS.—For new infant school at Groeslon Dinas, Llaniestyn, Pwllheli, Carnarvonshire. Mr. R. L. Jones, architect, Carnarvon:— Jones, Roberts, & Jones £721 13 6 J. Griffith & R. Jones £594 0 0 G. Griffiths £65 0 0 Griffith Jones £15 0 0 J. H. Roberts £60 0 0 Morfa Nevin, via Pwllheli £575 0 0 [See also next page.]

GEDDINGTON.—For new club premises for the Working Mens' Club and Institute, Geddington, near Kettering. Messrs. Mosley & Scrivener, architects, Northampton:—
 C. Andrew ... £650 18 0 | Smith, Edmunds & Co. £575 0 0
 Johnson & Phillips.... 621 5 0 | H. Judkins 557 0 0
 Gray Bros. 618 0 0 | E. Patrick 559 9 0
 Howard & Lewis..... 600 0 0 | W. J. Ford & Judkin 550 0 0
 T. & C. Berrill 599 0 0 | Smith & Bunting 524 15 0
 A. Lewis 596 10 0 | J. Patrick, Geddington* 496 0 0
 A. G. Godwin... 595 7 0

HANLEY.—For new sick wards at Denstone College. Messrs. Scrivener, architects, Hanley:—
 Bagnall £2,207 | Thorley..... £1,998
 Alcock 2,207 | Tompkinson & Betting 1,927
 Wood & Sons 2,026 | Godwin, Hanley* ... 1,860

HARROW.—Waldstone Bridge School, for the Harrow United District School Board. Messrs. Houston & Houston, architects. Quantities by Mr. R. T. Wreathall, F.S.I.:—
 R. A. Tonge £16,000 | Symonds £14,806
 Forster Bros. 15,977 | Thomas Turner ... 14,733
 Almond & Son 15,700 | Brightman 14,590
 Gough 15,524 | Smith & Sons 14,583
 C. Gray Hill 15,499 | Tout 14,538
 Lovell 15,432 | Lawrence & Co. ... 14,359
 Cowley & Drake ... 15,404 | F. J. Chinchon ... 14,200
 Chessum 15,132 | A. J. Batchelor, Harrow* 13,400
 Martin & Wells... 15,100 | J. Cracknell 13,470

ISLEWORTH.—For proposed lime and cement warehouses, river wall, pavings, alterations and reparations to premises, Lower-square, Isleworth, for Messrs. Wm. Lee, Son, & Co., Ltd. Mr. Henry Poston, architect, 39, Lombard-street, E.C. Quantities supplied:—
 Mowlem & Co. £4,492 | Hall, Beidall, & Co. £3,389
 Killaly & Gayford ... 3,423 | Blyton & Sons* ... 3,269
 Todd & Co. 3,419 | [Architect's estimate, £33,500]

LETTERKENNY.—For the renovation of second Presbyterian Church, Letterkenny. Mr. J. McIntyre, architect, Letterkenny:—
 W. Wilson £576 0 0 | J. Mooney, Londonderry* £544 0 0
 Stitt & Co. 572 0 0 | D. McCaffrey 546 0 93

LICHFIELD (Staffs).—For the erection of two semi-detached villas, Trent Valley-road, for Mr. Heath. Mr. J. W. Godderidge, architect, 4, Bolebridge-street, Tamworth:—
 W. Harvey Gibbs ... £1,975 | B. Mason, Glascote, Tamworth* £1,850
 T. Wainley 1,950 | Dent & Son 1,775
 E. Williams 1,900

LONDON.—For the erection of shop premises at Barking, E. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. Quantities supplied:—
 C. Deering & Son ... £2,037 | F. & T. Thorne ... £1,895
 Sheffield Bros. 1,944 | Courtney & Fairhair 1,853
 T. Osborn & Sons .. 1,905 | Todd & Co.* 1,839

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The Builder.

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St. Matthew's Church, Chapel Allerton, Leeds.—Mr. G. F. Bodley, A.R.A., Architect	Double-Page Int. Photo.
Hayes Lodge, Morley, Derbyshire.—Mr. G. F. Bodley, A.R.A., Architect	Double-Page Int. Photo.

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Architecture at the Royal Academy.



THE collection of architectural drawings in the Royal Academy this year is curiously heterogeneous in character. It would certainly be very difficult for any one unacquainted with English architecture to gather from it what were the dominant tendencies or convictions of English architects at the present moment. There is little to suggest the consideration of new paths in architecture; on the contrary, Classic on the one side and Gothic on the other seem more than usually emphasised. There is rather a want also of any really leading drawings of a powerful and effective type, such as are usually selected to occupy central positions; the hanging committee seems, in fact, to have been rather in a difficulty as to grouping the drawings, on this account; they have adopted the drawing of one Academician, Mr. Jackson, to occupy the centre space on the east wall, and three church interiors by another Academician face it on the west wall; but the south wall is a medley with no centre and no leading motif.

The unexpected change of "Press view" day from the usual Wednesday to Thursday, for no obvious reason, must have occasioned considerable inconvenience to the representatives of many weekly papers, and obliges us to be content, in this first article, with rather hurried notes of some of the principal designs. To begin with the Academicians, Mr. Jackson's drawing before referred to (1,568) represents, in two long coloured elevations, his new buildings at Cambridge, which if we remember right were represented either in perspective or in another elevation last year. The buildings, in red brick with curved gables, and red-tiled roofs, are completely collegiate in character, and convey the impression of having been purposely assimilated to Cam-

bridge surroundings, as the same architect's buildings at Oxford are assimilated to Oxford surroundings. The manner in which the large windows of the Law Library, which show on both elevations, are slightly varied in treatment though kept to the same general proportions, is a nice little point in the detail. We are glad also to find an Academician architect setting the example of illustrating buildings in geometrical drawings in this exhibition. Another Academician, Mr. Aston Webb, also exhibits a large geometrical drawing (1,616), a coloured detail elevation of a portion of the intended façade of the completion of the South Kensington Museum. This shows a terra-cotta-faced building with multioned windows, a column between them in the lower story, while in the upper story the windows are separated by niches containing statues of artists (Donatello and Matsys are the two shown here—a curiously-assorted couple), shadowed with canopies. In this case the character of the design shows that kind of eclecticism which we noticed as less conspicuous than usual in this year's exhibition. The detail shown is suitable to terra-cotta, and is not too exuberant—the besetting danger in detailing with such a plastic material. Mr. Webb also exhibits a view of a more unambitious and practical building, the block for the "sick quarters" in connexion with the Britannia Royal Naval College at Dartmouth, which is illustrated in our present issue. As will be seen from the plan, it consists of three blocks of wards with two-story connecting corridors; these, and the loggias facing south-east at the end of the wards, are made use of so as to gain a little suitable and unpretending architectural effect. We also illustrate in the present issue the interior of the church of St. Matthew, Chapel Allerton, near Leeds (1,654), by Mr. Bodley; the drawing forms the centre of his group of three church interiors at the end of the room already referred to. The architecture, as will be seen, is of that perfectly orthodox and conservative type of the Gothic revival which we rarely meet with in new church designs now. The organ is placed

in the old cathedral portion, over the chancel screen—a very good position for sound and for effect, provided the building is on a scale to afford proper space for it. In the present instance the organ gives the impression of being rather small, and we should like to know where the 16-foot pedal pipes are provided for; and it strikes us also that the appearance of the base to the organ-case, from which it is corbelled out, is not adequate to carry the super-structure; but it might have a different effect when seen in detail. We have no doubt that the colour effect of the nave and aisle roofs will be very agreeable and harmonious. Mr. Bodley exhibits, too, a perspective view of a house, "Hayes Lodge, Morley" (1,647), of which also we are enabled by his kindness to give an illustration in the present issue. There are some interesting points in the plan of the house, but we should not ourselves have thought a very large end window, facing full south, a good way to light a dining-room. The question of prospect, however, may have influenced this. We may observe that both this house and the church, in their architectural character, illustrate very well what Mr. Bodley said a year or two ago in an address at the Institute, in regard to the value of refinement and repose in architecture. Some of us may consider these two buildings wanting in originality; they repeat well-known types of Gothic architecture. But they certainly possess that quality of refinement to which their architect attached so much importance, and which he considered (we fear not without reason) was too often wanting in modern architecture.

Of Mr. Bodley's two other church interiors—"St. Mary's, Eccleston" (1,651) and "New Church, Kensington" (1,657), the former shows a vaulted nave, the latter a painted barrel ceiling carried by (apparently) stone arches acting as principals. One is inclined to think that in such a case more of the stone arch should be shown below the ceiling; we know that there must be a sufficient depth of spandril to make such an arch stable, but the eye rather wants to see some of it. Both these churches are

in the arcade design, of Early Decorated character, the first somewhat massive in proportion, the second with slender piers which rather remind one of Pugin's habit of design; in both of them the east window represents a late period of Gothic, verging on Perpendicular. We presume that Mr. Bodley thinks it allowable to play with and mix the details of past styles in this manner. It is open to question; perhaps, if we consent to the use of imitation mediæval at all, we have a right to pick and choose, and combine as we please. A fourth exhibit by Mr. Bodley is of considerable interest, it is the new tower designed by him (we know not if already built) for the splendid church of Long Melford in Suffolk. However one may in general object to the addition of modern Gothic to an ancient building, the former Georgian tower was so utterly devoid of interest and such a disfigurement to the church that we would certainly rather see a modern tower designed to harmonise with the rest of the building. Mr. Bodley has kept, of course, faithfully to the architectural tradition of the church, introducing the characteristic flint decoration in the basement and parapet; the angle pinnacles of the tower are very finely and effectively designed; the whole thing is done, in fact, as well as it is possible to do in such a difficult task as adding a new feature to an ancient building.

Two notable competitions, the Old Bailey and the Strand Improvement scheme, have furnished their quota to what may be called the show drawings of the exhibition. Mr. Flockhart exhibits a fine perspective drawing (1,561) of his design for the Public Building block for the Strand Improvement scheme; a very effective piling up of classic materials out of what Mr. Lethaby called "the Renaissance box of bricks," which is shown extending on a curved line behind St. Mary-le-Strand; but it must be observed that it quite crushes the church, both in respect of scale and tumultuous character of detail; and this is hardly to be wished. Messrs. Runtz & Co. exhibit two drawings of their design in the same competition; "Sketch for Exterior of Gaiety Theatre and Morning Post Offices" (1,560), and "Suggested Scheme for Municipal and Commercial Buildings" (1,559). The former shows a picturesque irregular grouping of blocks of building lying in different directions, with a low tower, crowned with a dome and angle pavilions, coming unsymmetrically into the composition. All this looks well enough, but a key-plan at least should have been given. In the other drawing (1,559) the towers at the extremities of public building block are very pleasing in effect, with graceful cupolas mounted on nearly plain masses of masonry which serve to flank and terminate this part of the composition; the general architectural treatment, while dignified, is quiet and reserved; but somehow the columned portico and pediment in the centre seem out of place, and as if they belonged to another building. Near these, and in the centre of the wall, a considerable space is occupied by a very large perspective drawing of some street buildings at Finsbury-circus, which is entirely without architectural or artistic interest; it is just a big drawing of "new premises." Why is this kind of thing hung, to the exclusion of works of artistic in-

terest? We know of drawings far superior in interest to this, which have been refused; four good works illustrated in smaller drawings might have hung in the space occupied by this large piece of commonplace; and if the Academy is to act up to its title as an Academy of Arts, it should surely prefer artistic quality to superficial area in a drawing.

Two of the Old Bailey competitors are represented; Mr. Mountford by a beautifully neat and finished perspective drawing shaded in Indian ink, of his exterior design (1,611), and an equally well executed one of the interior of the central hall (1,608). The latter represents a very dignified domed interior; the exterior design is of the kind that is called "imposing;" it looks exceedingly well and there is no fault to find with it, but somehow it does not interest one very much: it is correct and cold. In the draughtsmanship, by the way, there is a fault in the drawing of the curves of the dome cornice where interrupted (to the eye) by the angle feature; the curve on each side is "tucked in" too much, and does not appear like a continuous curve interrupted; so exceedingly rare is it to see the perspective curves of a dome cornice correctly drawn, even in a careful drawing presumably by an architectural draughtsman. As to painters, they are hopeless in such a case; none of them can draw a dome. Mr. Baggallay's design for the Old Bailey Sessions House is also represented in a large perspective drawing (1,612); as we said at the time of the competition, we considered this the most characteristic and suitable design in the competition, and it presented also the best plan. The plans are not given in either case. Mr. Belcher also exhibits the perspective view of his exterior design in the same competition.

Messrs. Ernest George & Yeates, from whom we are accustomed to see drawings of pleasant and picturesque domestic interiors and exteriors, exhibit this year only one work of quite a different class, viz., the North London Crematorium in Finchley-road. They succeed in showing, however, that a crematorium may be made the occasion for an interesting and picturesque architectural grouping. The plan is given, showing an entrance forecourt with the chapel on one side of it, and a door at the further side leading into a long round-arched cloister which connects all the buildings together. A kind of Lombard-Romanesque style is adopted; above the furnace rises a tower stopped short with a cornice and a flat roof, which acts as campanile to the chapel, the bells being visibly hung in the openings of the tower; but we presume this tower also acts as an escape for the fumes from the furnace. Connected with the cloister by a portico is a small octagonal dome building, not named on the plan, but perhaps the columbarium, which groups well with the rest. What one notes in this design is that it is treated with a picturesque simplicity, added to by the plain tiled roofs, which forms a complete contrast to the dead kind of official architecture often found in erections of this class, built for public authorities.

Among others of the more important buildings illustrated is Mr. A. C. Blomfield's "Rebuilding of Bank Buildings, E.C.," for the Bank of England (1,646). This is a classic design shown in a careful outline

drawing; a treatment of an angle site, the centre block at the angle being kept in a flat mass, contrasted by a pavilion crowned with a cupola at a little distance on each side of it, the intervening portions of the front being treated as subordinate. The prominent portions are decorated with an order, and the whole tied together by a continuous rusticated ground story. The effect of the contrast of the centre and side pavilions is very good; but the whole façade seems to want something rather stronger at the ends to flank it. Profess Aitchison exhibits a drawing of offices at 44, Mark-lane (1,538); it may be described as a Romanesque design of very North Italian character, in three stories of round-arched windows, the arches carried on columns with very widely-projecting caps; the voussours of the arches have an ornamental device hatched into them, and over the ground story is a frieze composed of a flowing inlay of coloured marbles. The whole treatment is very original. Mr. Colcutt's perspective view of Lloyd's Register Offices (1,561) represents in complete form a building of part of which there was a very effective drawing in last year's Academy.* This building is a fine example of remarkably bold and picturesque treatment of columnar orders, rendered possible by walls evidently of ample thickness; the design of the piers of the attic, a collection of colonnettes bonded together in a bold rustication, is remarkable effective. Sculpture is well introduced in the spandrels of the grand story arches. The corbelled-out angle turret, a very effective feature, would be the better for a little more simplicity; it is rather too much cut up with small detail.

We may conclude our present notice by drawing attention to two small drawings, both hung low and which might easily be passed over, but remarkable for their originality. One is Mr. Beresford Pite's perspective sketch for "A Memorial Bridge" (1,672), showing a bridge with a triple archway built across the centre, crowned by a sculptured trophy in the centre of the block, while on each hand, to right and left, a double colonnade extends, covering the footways, and stopped at the ends by an arcaded pavilion. The idea is fine and original, and worth working out on a larger scale. The other is Mr. Ricardo's remarkable design for the "Terminal Station for the East Indian and Bengal and Nagpur railways, at Howrah (Calcutta)" (1,588). It has been maintained that it is impossible to absolutely originate an architectural treatment which is not more or less based on precedents, but Mr. Ricardo really seems to have succeeded in doing it, for this is like no other architecture we have ever seen, and seems to be a treatment growing directly out of the practical requirements, without regard to what are generally looked on as architectural features. It is impossible to describe the design, because it eludes the usual terms to be found in architectural glossaries; but we shall be able to illustrate it shortly. We should have liked better if the open loggia in the upper stage had stopped against the towers instead of partly extending in front of them, which produces rather a piecemeal look. But the whole thing is a healthy contrast to the "Manchester Gothic" terminal station which has hitherto excited the admiration of the Anglo-Indian.

* Illustrated in the *Builder* of September 22, 1900.

SPANISH ART AT THE GUILDHALL.

THE idea of making the popular Guildhall Exhibition this year an illustration of Spanish art was a happy one, since it was likely to interest artists as well as the general public, by bringing before them the works of some modern painters who are not very well known in this country. Modern Spanish pictures do not come this way very much, or are the names of their authors familiar. But we do not know that the collection in the large gallery, entirely composed of works by living or recently deceased Spanish artists, is calculated by itself to awaken much enthusiasm. There is a head of a Morocco negro by Fortuny (5) which is of amazing power; but then Fortuny stands alone. There is a large sketchy picture by him of "Acrobats at Tetuan" (7), which in every way reminds one of Decamps. Of the larger works in the same gallery those of Goya and Velasquez are of a grandeur of radilla are the most important in scale and subject; his "Boabdil Surrendering the keys of Granada" (8) is a well-composed historical picture, in a broad full style of execution, but, like some other works in the gallery of the same class, it seems to fall short of dramatic point and expression. What interests one in general in the large gallery is a certain special quality of painting which strikes the eye as unusual; a very bold use of colour without a corresponding attention to detail; a very strong and vivid effect of sunlight in outdoor scenes, as in Rodriguez' "Garden in Seville in November" (11). We say outdoor scenes purposely, for of landscape painting the real sense of the word there is nothing; if we are to judge by this show, it does not exist for the Spanish artist. The elaborate interior by Salvador, "A Late Concert" (22), in which a scene, common-place enough in its incident and its personages, is made the occasion for a kind of gem-like effect of points of colour, is a remarkable work of its kind, but it is of a type which the French would call *cliquant*, and appeals rather to the eye than to the intellect. Gallegos' elaborately finished ecclesiastical interiors are familiar to the requesters of Messrs. Tooth's Gallery, and are admirable of their kind. Among the pictures which have some interest of character and expression is Melida's "The Communion of the Nuns" (31), in which the group of heads forms a remarkable example of contrasted character. Cordero's architectural pictures are very good. But in general the interest of execution is beyond the intellectual interest. Such a picture as Tusquets' "A Roman Shepherd" (26) is hardly to be called art at all, any more than wax-work is art.

There are in fact only two real painters among the Spanish—Velasquez among the ancients and Fortuny among the moderns; and the best of all the others are bad seconds, or hardly seconds to them. It is they who in this case really make the exhibition, which is not confined to modern work. The second gallery contains a sad and sombre collection of the respectable mediocrities of the Spanish school, reminding us—

"how Spagnoletto tainted

His brush with all the blood of all the sainted,"

and how Zurbaran produced unhealthy-looking monks painted as if his brush were dipped in an inkpot. Murillo's one sweet

and lovely though sentimental ideal in painting, "The Immaculate Conception," is represented in the picture lent by Sir Cuthbert Quilter (84), shining here like a light in a dark place; his "Infant Jesus Asleep" is also worth attention, and has a little of that expression of supernatural power which we see in Raphael's wonderful infant. Two or three portraits by Goya have character and colour; and his picture of "The Bulls" in the arena (72), black and dingy as it is, is certainly not lacking in energy. But otherwise this room is a melancholy spectacle, from which we escape up two or three steps to find ourselves, in Gallery 3, amid a whole collection of Velasquez pictures; a culmination which takes one by surprise. At the first sight of his masterful portrait of Quevedo the mediocrities of Gallery 2 fade from one's recollection. Here we are in a room where nearly every work is a masterpiece. Among the collection is the "Water-carrier of Seville," the picture which came by such odd fortune of war into the hands of the Duke of Wellington; one of those works in which an ordinary incident of lower-class life is raised into intellectual interest by the power of art. Compare this with Tusquets' "Roman Shepherd" before mentioned, and realise the distinction between art and mere realistic painting. "The Omelet" is another lesson of the same kind. Among the exhibits is the splendid portrait of Philip IV.; that of Isabel de Bourbon, and that of Olivares, a political scoundrel whose chief value to us now lies in the fact that Velasquez painted his portrait, a perfect embodiment of dignity of manner and rationality of character. The picture is here in two editions, of which that belonging to Mr. E. Huth (127) is undoubtedly the masterpiece; it is possible to imagine that the other (130), lent by Captain Holford, is a copy; at all events, if there is any question of authenticity, this is the one that must give way; compare the painting of the hands in this with those in No. 127. The whole roomful is a delightful and exciting surprise, led up to in a most effective manner.

There is a further surprise in store for the visitor, however, in the works by Fortuny in Gallery 4. As we have said, Velasquez and Fortuny are the two real Spanish painters, and it is curious that Fortuny, like Velasquez, should be notable for that kind of artistic power which compels our interest in commonplace and even repulsive subjects by mere power of treatment. We confess that, to our thinking, Fortuny's picture called by the beautiful title "The Garden of the Poets," suggesting associations so far from those conveyed in the painting, is in feeling and character detestable—one is inclined to dislike the man who painted it; but it is a work you cannot pass over. The interior entitled "The Spanish Marriage" (177) has not this kind of drawback, and it is a perfect triumph of brilliant effect, and splendid indication of detail all subordinated to the total result—indication of detail, for Fortuny had that power which only belongs to the first class of masters of the brush, of indicating everything without any hardness of mechanical finish. In the same gallery there are a good many other small works of interest; various architectural subjects by Cordero; Fortuny's charming fancy entitled "The Butterfly"; and others worth atten-

tion. It is in this gallery and the Velasquez room that the real interest of the exhibition lies; the rest is of comparatively little consequence.

NOTES.

Architects
Certificates.

OUR readers must be all acquainted with the cases of Chambers v. Goldthorpe and Restell v. Nye, in which it was decided that an architect in giving a certificate was in the position of an arbitrator, and, therefore, was not liable for negligence. When they were decided we commented on these cases at length. It is, therefore, now sufficient to say that in the official Law Reports for April there will be found the opinion of the Court of Appeal on these two cases. The decision of that Court confirms the lower Court, and it is now definitely settled that an architect under the circumstances above stated is to all intents and purposes an arbitrator. The case of Rogers v. James, which was also a decision of the Court of Appeal, is distinguished, and we may regard the point as now beyond discussion for good or for evil. It is desirable, however, to mention that Lord Justice Romer differed from the other two Judges. He considered that the authorities did not bear out the contention of his brethren, and he added that he considered that the liability of the architect to his employer for negligence was "more in consonance with natural justice." "It would be lamentable," he said, "that in cases of this kind an employer who pays an architect for supervising work, and who has sustained damage by his negligence, should have no remedy against him." It may fairly be said that the law as it stands does not tend to care on the part of an architect, and puts a careless in the same position as a careful practitioner.

By the Electric Lighting Act of 1882 the Board of Trade is empowered to make, amend,

or repeal regulations for securing public safety or for ensuring a proper and sufficient supply of electrical energy. We cannot congratulate those who drafted the amendments issued this week to the old regulations. In the first place, the amendments are an almost unintelligible mass of verbiage, and in the second place we fail to see how they are going to help to secure the public safety or to ensure a steady supply of the electric light. So far as we can understand the second amendment, it amounts to this, that the Board of Trade is ultimately to have the power of forcing a consumer to give up his vested interest in a low-pressure supply. If they think it necessary they can employ a single arbitrator to fix the amount of compensation due for any loss or damage incurred in the changing from low to high pressure. The position of this arbitrator would not be an enviable one, as it is notorious that electricians are at present divided amongst themselves as to the merits and demerits of a high-pressure supply. The Board of Trade cannot be accused of unduly oppressing the supply companies; when their regulations tell against the companies the penalties are not enforced, and when the regulations favour the consumer they are amended. If these amendments are legal, then high-pressure supply will become practically universal, and it is to be hoped that inventors will design new systems of

distribution in which there is no danger from shock, and in which no damage is done by leakage currents.

The ninth "James Forrest" "James Forrest" lecture was delivered by Dr. Frank Clowes before the Institution of Civil Engineers on the 25th ult. The subject of the lecture was "Chemistry in its Relations to Engineering." Dr. Clowes emphasised the importance to engineers of at least an elementary practical acquaintance with the science of chemistry. Chemists and engineers should, he thought, work together. Engineers should have some knowledge of chemistry, and chemists should know something of engineering. As a rule, in this country engineers knew too little of chemistry, and chemists too little of engineering. He recognised that engineers could not possibly devote sufficient time to chemistry to become expert chemists or analysts, but with an elementary acquaintance with chemistry they could co-operate more intelligently with the professional chemist. As Chemist to the London County Council, Dr. Clowes has had experience of the utility of the joint application of engineering and chemical skill to the study of sewage disposal, and he considers that the success of his oil and hydrogen safety-lamp, which is now so extensively used in mines and for testing the condition of the atmosphere in the tanks of oil-tank steamships, is due to the assistance he received in its construction from engineers. Much that Dr. Clowes said concerning the relationship of chemistry to engineering might be applied with equal truth to chemistry and building construction. We have repeatedly drawn attention to the necessity for more co-operation between the members of the allied professions, and pointed out how such co-operation has been adopted with advantage on the Continent. We are glad that so eminent and able an officer of the London County Council as Dr. Clowes has taken this opportunity to demonstrate the desirability of reform.

THE papers by Mr. Campbell and Mr. Crawley on electrical measurements which were read to the Institution of Electrical Engineers treated of a subject of great importance to the industry. Mr. Campbell in the first part of his paper dealt more particularly with alternating current measurements, and the many methods he described showed the great variety of problems connected with measurement that have to be solved in a busy test room. One of the members who spoke criticised severely this part of the paper. In his opinion a good watt-meter would make all the measurements better than any of Mr. Campbell's combinations of instruments. In our opinion, however, he overlooked the fact that these methods were supplementary to the ordinary watt-meter methods, and, in fact, are absolutely necessary in order to check them. We can hardly be expected to take alternating current watt-meters on trust from the makers; tests must be devised in order to see whether they read correctly, and some of the methods described by Mr. Campbell answer this purpose excellently. In the second part of his paper he described various methods of getting a constant current or a constant

voltage from a varying supply. These arrangements, as pointed out by Dr. Glazebrook, will be valuable in standardising laboratories for testing ordinary electric meters. Mr. Campbell makes use of the fact that the electric resistance of a nickel wire varies in an extraordinary, but well-defined manner with its temperature. He showed experimentally how he could maintain a lamp at constant brightness by his regulator, although the pressure of supply altered between wide limits. Mr. Crawley described a method he had perfected of measuring resistances accurately and with great rapidity by means of a differential galvanometer. This method has been tested at the Board of Trade laboratory, and has been found of great use for many every-day tests.

A PAPER read by Mr. Gill before the Dublin Section of the Institution of Electrical Engineers, on the 18th ult., describes a most remarkable experiment with a telephone and a microphone. An ordinary microphone transmitter is placed in series with an electric battery and the primary circuit of a small induction coil with the vibrator screwed tight. A telephone is then connected across the secondary terminals of the induction coil. Now, on bringing the telephone within an inch or two of the diaphragm of the transmitter, an extraordinarily loud musical note is emitted, and this note continues as long as the telephone is held near the microphone. On first reading Mr. Gill's paper we thought that very careful tuning would be necessary, and we were agreeably surprised to find that we could reproduce the experiment with the first apparatus we tried, and that no tuning is necessary. In fact, it is very difficult to put it out of tune. Placing a small variable condenser across the telephone, we were able to alter the note by moving the condenser plugs, and hence could attempt to play a tune on the telephone which could have been heard in a large concert hall. The explanation of the phenomenon is difficult. Mr. Gill is probably right in attributing it to electrical resonance, the vibrations being transmitted between the diaphragms of the telephone and the transmitter by the air. On putting a thin wooden board between the two diaphragms the note at once ceased. This experiment is very much easier to reproduce than the one shown by Mr. Duddell at the Institution last December, when he made the electric arc between the carbons of an arc lamp emit a musical note, and the note emitted is quite as loud. Mr. Gill's discovery, that the pitch of the note is altered when the telephone connexions are reversed, is very remarkable, but we are not altogether satisfied with his theoretical explanation of this effect.

WE learn that under a revived scheme for making an underground railway from the West End of London into the City, the church of St. Mildred is again threatened with demolition. Nearly three years ago the vaults were cleared to a depth of from 16 to 17 ft., their contents were removed to the City of London Cemetery at Ilford, and a new floor, constructed of steel girders and concrete, was laid by Messrs. Dove Brothers, under the superintendence of, we believe, Mr. Charles Innes. The interior of the church—

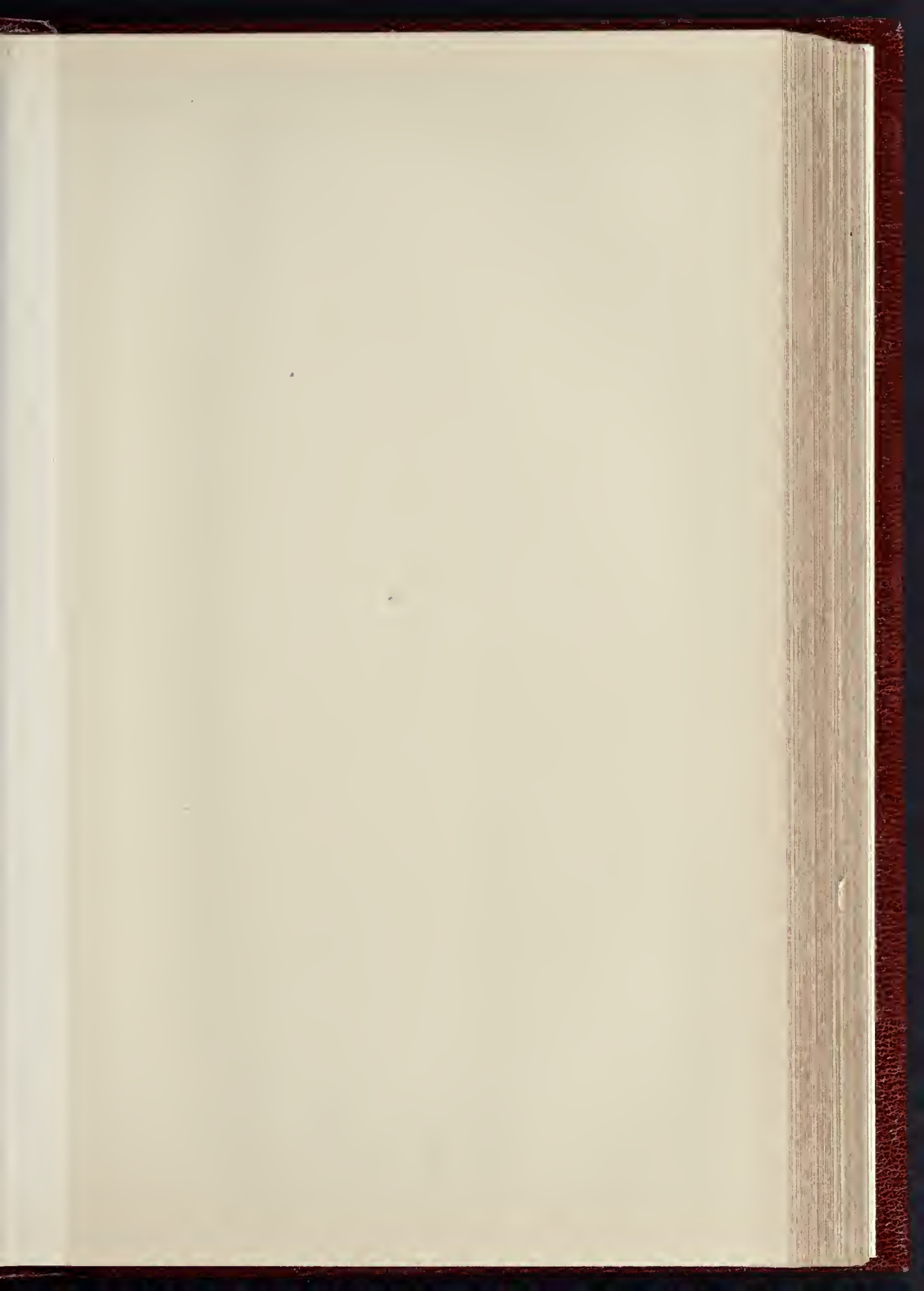
illustrated in our number of July 3, 1880—had been repaired and beautified in 1856, when the cherubim placed in pairs and holding crowns, badly executed in high relief, were removed from the dome ceiling. It has, however, escaped from the untoward fate that has attended many of Wren's London churches, for it stands, undisfigured with mediæval adornments and nineteenth-century rearrangements, just as the master left it upon the completion of the fabric in 1683, at a cost of 3,705*l.* The plan is an oblong with a brick tower, 18 ft. square at base, at the south-eastern angle. The tower carries a lead-covered spire, rising to 140 ft., comprising a concave pyramidal roof above the blocking course of the tower, above which are a lantern having large openings with a slender spire surmounted with a ball and vane. The roof of the church, too (as constructed by E. Strong the elder), is noteworthy, the cupola, which rests upon four pendentives, being formed within the external roof of the ordinary tie-beam and king-post kind, with slight deal ribs secured to the principal timbers and lathed and plastered, whilst in order to give space for the swell of the cupola, some of the tie-beams, instead of being attached to the feet of the principal rafters, are lifted about half-way up, so as to constitute collar beams, and diagonal braces from rafter to rafter are inserted. The beautifully carved work of the altar-piece, the pulpit, and sound-board is attributed to either Grinling Gibbons or one of his pupils.

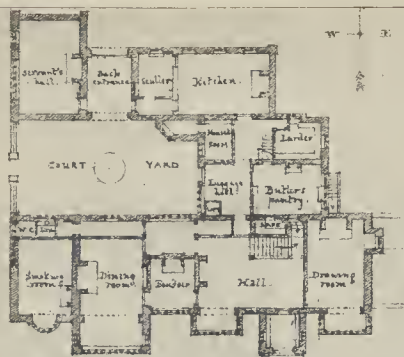
THIS interesting property, extending over 215 acres, is placed in the market. The house and grounds, encompassed with beech trees, are situated at an altitude of about 400 ft. upon the chalk range in the northern part of the county. The property, however, is chiefly notable for the ancient British camp, which lies just within the north-eastern angle of the crossing of the main road from Basingstoke to Salisbury, and the main road from Winchester to Silchester. The camp, which is circular on plan, is in a field along the eastern side of a portion of the ancient military road, the Herepathe, that may yet be traced across the country, extending almost due north and south to Southampton. At Winklebury and in the immediate vicinity have lately been discovered various early remains, including what are taken to be the horns, bones, and teeth, as burnt for sacrifice, of the *Bos longifrons*, or Celtic short-horned ox, a species that lived, as we are told, from the later Neolithic period to the close of the fourth century of the Christian era. It is believed that the fort existed at a time long antecedent to that of the Roman occupation of Great Britain. At a later period (870-1) it formed the stronghold of Ethelred, son of Ethelwolf, and of his brother Alfred, who, it is said, sallied forth from Winklebury camp at the head of the men of Wessex to meet the Danes who had advanced from Reading, at Basing, three miles distant. The camp was held by the Parliamentary forces when in 1643-5 they laid siege to Basing House.

THE present exhibition of the Society of Painters in Water Colours is not quite one of the best. The absence of Mrs. Allingham, who

St. Mildred's Church, Bread-street.

The Society of Water Colours.





Ground Plan

Scale 1" = 10' 0" Refd.



HAYES LODGE MORLEY
DERBYSHIRE
G.T. BODLEY : A.R.A. ARCHITECT
7 GRAYS INN SQUARE : LONDON.



INK-PHOTO, SPRAGUE & CO. LTY 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

has been concentrating her work on her own exhibition to open next week at the Fine Art Society's rooms, is a loss; some able contributors are not equal to their best; there are both dull and eccentric works to be found on the walls; the contents of the two screens are unusually devoid of interest. Mr. Robert Little, who is one of the irreconcilables, and whose style constitutes a "rendering" rather than an imitation of Nature, is nevertheless very powerful in his landscape "A Jacobite Gathering" (10); he has at all events a style. Mr. Albert Goodwin's views of cities and cathedrals become more and more delicate and beautiful but also less and less like reality; his "Naples" (15), with the pile of buildings in the foreground and Vesuvius in the distance, is a lovely composition, but too artificial. He gives among other things a view of the front of Wells seen at a little distance across the lawn, with the twilight just allowing the lights in the interior to show a glimmer; a very charming effect. Mr. Tom Lloyd's "Evening in June" (22) is one of the larger and more highly finished landscapes, the repose of which seems a little marred by the strongly marked oblique line of the mass of western clouds; this may be after Nature, but if so, Nature did not compose well in this case. Mr. R. W. Allan exhibits his bold and bright effect of open air and light very powerfully in "Scotch Fishing Village" (37), one of the most successful works in the room in giving the effect aimed at. Two of the finest landscape-painters in the Society, Mr. Eyre Walker and Mr. Cuthbert Rigby, have both painted winter scenes (99 and 92). Mr. Rigby taking Ennerdale, and giving us an unaccustomed aspect of the Lake district. Mr. Colin B. Philip's "At Barmouth, North Wales" (100) is also a very fine work. Mr. Arthur Melville is an experimenter, and is now trying to see "A Highland Autumn" (33) in masses of blue, instead of treating human figures in that way; but the experiment is hardly convincing. Mr. Pilsbury's "Golden Autumn" (82) is one of the best things he has produced in his peculiar highly-finished (rather too finished) style of landscape painting. The Exhibition boasts two contributions from Sir L. Alma-Tadema, both of them drawings made for scenes for "Coriolanus," and from their point of view very interesting, archaeologically and architecturally. Among other architectural drawings are two "Christ's Hospital" subjects by Mr. S. J. Hodson (19 and 36), "The Gate of the Apothecaries' Garden, Chelsea" (26), by Miss Rose Barton; "The Old Street of Paris at Senlis" (120), by Mr. Rooke, and "A Mosque Door, Cairo" (144), by Mr. R. Barratt. Among other works which we like are "A Cornfield in Sussex" (54), by Mr. Thorne Waite; "The Pillar Rock" (80), by Mr. Cuthbert Rigby; "View from above Aysgarth Force" (83) by Mr. Eyre Walker; "The Bristol Valley" (117), by Mr. Thorne Waite, a small but beautifully balanced landscape in a slightly old-fashioned style; and "Evening" (152), two women burning weeds, by Mr. A. H. Marsh. Mr. E. Alexander exhibits a very large "Study" (146) of a peacock, in which he seems to have got all of the peacock but the brilliant colour—a peacock glazed over with lampblack. Surely the colour is the most important element in the glory of the peacock.

Society of
Fine Arts.

THE collection of pastels by Mr. Sutton Palmer, now exhibiting at the Society of Fine Arts, shows admirable treatment of the material, but also indicates its limitations. The subjects are all landscape; and we hold that it is almost impossible to represent in pastel all the gradations of colour in landscape. In the evening scenes, a time when the meadows, &c., have lost much local colour and are rather blended into half tints, pastel may be more successful than with scenes in full daylight; this is illustrated, we think, in some of the works here; Nos. 7 and 12, for instance, and 20. There are some charming daylight landscapes however: "Stream near Barnard Castle" (35), showing masses of tree-clad hills and masses of white cloud; "Water Meadows" (39), and "Hayes Common" (16). Perhaps it may be said that Mr. Palmer has done with pastel all that can be done in landscape, and more than one could have expected; but for all that we think figure-subjects are the proper field for this medium. The drawings of hunting scenes, made by Mr. Jalland for *Punch*, exhibited in the same gallery, come under the head of comic or humorous art; they are very clever, but seem a little out of place here. Those who are familiar with them as engraved will be perhaps surprised to find that the originals are water-colour drawings, on a much larger scale than the *Punch* illustrations. On the whole they show more to advantage in black and white.

LETTER FROM PARIS.

THE work for the completion of the basilica of the Sacré-Cœur at Montmartre is now being rapidly pushed on under the direction of the architect, M. Rauline. Two wells, 110 ft. deep, have just been completed for the foundations of a belfry. The electric-lighting installation is being prepared for the crypt and the church. The sculptor, M. Fagel, is putting the finishing touches to the decoration of the chapel dedicated to the Army. In each metope are finely sculptured military scenes, and groups of soldiers representing various arms; on either side of the chapel are figures of Saints Maurice and George, the patron saints of the Army. The decoration of the other chapels dedicated to the Navy, Agriculture, Commerce, Industry, and Medicine, will shortly be put in hand. The restoration of the old Roman church of Saint Pierre, close under the basilica, is rapidly proceeding.

The jury has made its awards in connexion with the competition of facades of houses lately erected at Paris, as follows—House No. 81, Rue de Lota, architect, M. Bouwens-Van de Boyen; No. 270, Boulevard Raspail, by M. Breneau; No. 17, Avenue de Breteuil, by M. Marcel; No. 1, Rue Peletier, by M. Morin-Goustiaux; No. 11, Rue Edmond-Valentin, by M. Sinell; and No. 45, Rue du Chateau-d'Eau by M. Rives.

The plans for the enlargement of the Bourse having now been at the disposal of the public for the past fortnight, the necessary authority will be given, and the architect, M. Cavel, will at once proceed to start the foundations for the two important new wings. The postal and other services will be installed in temporary buildings in the square surrounding the Bourse.

The Commission du Vieux Paris at its last meeting, when welcome was given to the two new members, MM. Henri Lavedan and André Hallays, decided to submit to the necessary authorities its wishes with regard to the preservation of the old Hôtel Rohan, now occupied by the Imprimerie Nationale; the preservation of the house occupying the angle of the Quai des Orfèvres, in front of the Pont Neuf, in order to maintain the physiognomy of this seventeenth-century portion of Paris; the maintenance of the still existing pavilions of the old barriers of Paris, erected by Ledoux at the end of the eighteenth century; and the

respect to the characteristic names of some of the oldest streets of Paris so interesting in the history of the town. By the request of the Société des Amis des Monuments Parisiens, M. Selmersheim, Diocesan Architect, has decided to re-erect, in the small square close to the Cathedral of Notre Dame, the fine old railings characteristic of one of the best epochs of French art, which once divided off the choir from the nave, and which were suppressed by Viollet-le-Duc when he undertook the restoration of the cathedral. These railings once formed portion of the interior decoration designed by Robert de Cotte, under Louis XIV., in execution of a vow made by Louis XIII.

The prolongation of the Rue Villebois-Mareuil makes it necessary to demolish the interesting old pumping station of Chaillot, situated at the angle of the Quai de Billy and the Avenue du Trocadéro, called the "Pompe à feu de Chaillot." The building still carries on its front the date 1781, that on which the brothers Perier constructed the pumping station and installed therein two English pumping engines of the Newcomen system, brought over by them from England. These two engines, known to all Parisians as "Augustine and Constantine," distributed all the drinking water at Paris from 1782 to 1857, pumping the water from the Seine to the high-level reservoirs constructed on the present Place des États-Unis, the supply descending thence to the four principal water fountains in Paris, at the Porte Saint Honoré, the Chaussée d'Antin, the Porte Saint Denis, and the Rue du Temple, whence it was fetched by the water carriers. These two engines, which inaugurated the water service at Paris, have been constantly at work up to a few years ago.

The competition for the construction of the new Hôtel de Ville for Sens has been gained by MM. Dupont et Poivert, architects. The building will be a rather important one in Renaissance style. The summit will receive an imposing figure of the warrior Brennus by the young sculptor Anatole Guillot, a homage done to the memory of the warrior so closely related to the history of this warlike city of old central Gaul, a souvenir of the taking of Rome in 388 B.C. The figure, which will be 9 ft. high, will be made of hammered copper, gilt.

The leading event in the artistic world of Paris at the moment is of course the opening of the two Salons for the first time in the new Art-Palace; but the contents of these will be described and criticised in our usual reviews of works of architecture, painting, and sculpture at the Salons, which will appear in the two next issues of the *Builder*.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE MEMORIAL TO QUEEN VICTORIA.

A SPECIAL general meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, W., Mr. E. A. Gruning (Vice-President) in the chair.

The minutes of last meeting having been taken as read,

The Chairman said that, on the written requisition of twelve subscribing members so to do, under By-law 60, the Council of the Institute had summoned the meeting to consider various resolutions as under, submitted by Mr. W. Woodward:—

1. That in the opinion of this meeting the proposed National Memorial to Queen Victoria should be open to the competition of all British—including, of course, colonial—architects, sculptors, and artists.

2. That the first designs should be in the hands of the Committee at the date already fixed—viz., the end of June next—and that from those designs six should be selected, the authors of which should be engaged to perfect their schemes, and submit them at a date to be decided upon by the Committee.

3. That the author of the design selected from the six should be employed to carry out the work in collaboration with the sculptor, or sculptors, whom the Committee may designate.

4. That in the event of the memorial being thrown open to general competition, as above suggested, the information furnished to the five architects already appointed, for their guidance in the designs, be immediately made public.

5. That the whole of the preliminary designs, as well as the subsequent perfected designs, be publicly exhibited.

6. That these resolutions be at once transmitted

to the Viscount Esher with a request that they be laid before his Majesty the King."

The Chairman also stated that several letters on the subject had been received, and he would ask the Secretary, Mr. W. J. Locke, to read them.

The letters were from the President, Mr. Wm. Emerson; Mr. Macvicar Anderson, past-President; Mr. J. C. Nicol, of Birmingham; and Mr. P. A. Robson, of London.

The President wrote:—

"DEAR MR. LOCKE.—With regard to the meeting convened for Monday the competition for the Queen's Memorial, will you—as I shall not be in town—inform the meeting from me that the Committees discussed and considered the three points as to whether—

- (a) An architect of eminence should be selected to prepare designs;
- (b) There should be an open competition;
- (c) If a few names should be selected to prepare designs, being remunerated for the same.

The Committees, after considerable discussion, agreed to adopt the latter course.

Beyond supplying this information, I do not think there is anything further for me to say on the matter.—Yours very truly, Wm. EMERSON."

Mr. Macvicar Anderson wrote:—

"DEAR SIR.—I regret that I am unable to attend the special general meeting of the Royal Institute of British Architects this evening, and that I am thus obliged to resort to the less satisfactory medium of pen and ink in order to express my views, which I hope you will do me the favour to convey to the meeting.

I wish to enter the strongest possible protest against the object for which the meeting has been convened as expressed in the resolutions to be submitted.

It may be matter of opinion what might have been the best course to have adopted in regard to the Queen Victoria Memorial—whether to have selected an individual in whom confidence could be reposed, or to have a limited competition, or to have an open competition. Personally, the last proposition is the one against which I should have voted, but that is not the point of my protest. If the nation desire that it be left open to all to submit suggestions, let this be expressed through the nation's representatives or the Press. What I strongly feel is that the very last body which should express such views as are embodied in the resolutions to be submitted this evening is the Royal Institute of British Architects, for its doing so would be tantamount to asking that its members who have not been invited to submit suggestions should be permitted to do so. Anything more undignified or less professional I cannot conceive. The matter has already been carefully considered by the responsible advisers of the Crown and by a Committee, composed of the official representatives, of experts—among them the President of the Royal Institute of British Architects—and the procedure recommended by them and adopted by the King should, in my opinion, be accepted by all in a spirit of loyalty, as I feel sure would have been the wish of our much-lamented Queen.

For the foregoing reasons—which I hope I have expressed clearly and concisely—I most strongly protest against the resolutions which are to be submitted to the meeting this evening; and should the Institute be so devoid of what, in my judgment, is due to itself in point of dignity and professional etiquette as to adopt them, I must respectfully request that such adoption may be accompanied by this protest.—Believe me, yours very truly, J. MACVICAR ANDERSON."

The following were the letters from Mr. Nicol and Mr. Robson:—

"DEAR SIR,—Referring to your circular calling a meeting of the Institute for Monday next, I regret my inability to be present at this special meeting to support the resolutions submitted by Mr. Wm. Woodward, but trust that they will be carried as, in the interest of the profession, they deserve to be. It is also most desirable at the present juncture that your President and individual members of your Council should state at this meeting, for the guidance of those who are asked to elect them, what their views are and what their action has been with regard to this national subject, and whether they are prepared to support the general principle of competition amongst architects or otherwise when asked to advise or express an opinion to public bodies; also whether they are prepared to support and actively assist the Birmingham Architectural Association in their present endeavour to induce the Council of the New University to reconsider their decision with respect to the appointment of Messrs. Webb & Bell as architects for the proposed technical buildings at Birmingham.

Awaiting your report, I am, yours faithfully, JOHN COULSON NICOL, A.R.I.B.A."

"DEAR SIR,—The great stir which the decision of the appointed Committee has created on their selection of but six gentlemen—five architects and one

sculptor—to compete in designing the national memorial—to the greatest of all queens augurs most hopefully for the future of the arts during this century. It has been said that the memorial should be the best that the British can produce. But why British? Why narrow the scheme? Our late Queen not only merits the best possible memorial, but the universal love she inspired should alone be sufficient reason to check this insularity. The precise form of the memorial is a matter of hot debate, but it is surely clear that there must be no poverty of broadmindedness, that the scheme must be sufficiently comprehensive to be at once a Valhalla of a splendid monarch and of her greatest men. Let there be three architectural competitions. One, universal, with designs on a very small scale, adjudicated by a strong international committee with a British predominance; two, a selected competition, the number being dependent on the merits of the designs sent in for the first (but not exceeding one hundred)—the competitors for this second competition to be adequately paid for elaborating their previous schemes and preparing models; lastly, the final competition, limited to three from which one design is to be selected. Then let the final design be elaborated, and let there be a single competition for the sculpture by means of models. All these competitions would be adjudicated by the same committee, and the designs publicly exhibited for the benefit of the fund. Mr. Norman Shaw has said that there is no classic school of design in Britain. Even if this is so, surely here is the one great opportunity for stimulating the desire to create one. A competition on this scale could not fail to increase the national prestige, to revivify the arts, and revere our late beloved Queen in a lasting way. I understand that the Committee desired to give one architect the commission in the same way as they have appointed Mr. Brock as sculptor, and that the profession have to thank the President of the Royal Institute of British Architects for even this limited competition. However, the matter having gone thus far, there are, at present, only two courses open—(1) for the selected gentlemen to proceed with their competition, (2) for them to resign *en bloc* in deference to the loud note of disapproval which is being rung throughout the Press; and there is no question but that the latter course would meet with unqualified approval from the public, which asks very rightly, 'If five, why not twenty?' and further still, why impose a limit? The commonwealth of the arts is neither national nor racial, but universal. If the thing is to be done well, let it therefore be universal.—I am, dear Sir, faithfully yours,

PHILIP A. ROBSON."

Mr. Woodward said he must thank the Council for affording them the occasion of meeting at the earliest possible opportunity. He and those who thought with him desired to show that art in this country was not on the ebb but on the flow, and they desired to give young men and others who might have grand conceptions an opportunity of giving expression to them. The Press was practically unanimous on the matter, and the memorial was one which the nation desired to be open to public competition. Seeing that the money was to be subscribed by the public, the public had a right to say, as they had said, that the memorial should be open to public competition. The object of the meeting was to declare that, seeing there was an opportunity to erect a monument to our great Queen which would last for ages the memorial should be an exemplification of the artistic feelings of the time. As the meeting was aware, a general Memorial Committee had been formed, and from that committee a special sub-committee, which included the President of the Institute. The President had not told them in his letter what steps he took to represent the feelings of the Institute. One would have thought that the President would have desired to give his Institute and the members an opportunity to show what they could do. There was not one of his opinions were, and he ventured to express the deepest regret—

The Chairman: It was quite impossible for the President to let any one know what were the confidential opinions of the committee.

Mr. Woodward, continuing, said that no one had one word to say against the five selected architects; but it was impossible for any of those five architects to know more than any other five architects what was the particular character required in this memorial. Had the asylum, he could have understood the committee selecting five expert architects, but no one had opportunities of showing their skill in the design of memorials of the sort proposed. It had been said that open competition would involve considerable trouble on the part of the assessors; he was not so sure, for he doubted whether the committee would be overrun with

designs for the memorial. Even if they were it would be easy to reject the designs which would have no chance. There were two great buildings which would have been lost to the world but for open competition, viz., the Paris Opera House and our own Houses of Parliament, and in this case we were more likely to get the best talent possible by open competition than by a competition restricted to five gentlemen.

Mr. Woodward then moved the first resolution.

Mr. Wilson seconded. He was sorry the Council of the Institute did not call a meeting to discuss the matter. They had heard that five architects had been appointed, but very few people seemed to have any real knowledge of what had been happening. It was for the Institute to look after its members, and they should have protested against what had been proposed and against matters being done in a hurry. He had heard remarks as to the difficulty of assessing in open competition, but the assessing in this competition might have been done by the competitors themselves.

Professor Beresford Pite said he was heartily in sympathy with Mr. Woodward's position, but he desired to move an amendment on the first resolution. Mr. Woodward's first resolution was inconsistent with his second, for how could the competition be open to all British architects, including colonials, when the designs were to be in the hands of the committee by the end of June next? His amendment was:—

"That, considering the deep and widespread interest manifested throughout the Empire in the proposed National Memorial to her late lamented Majesty Queen Victoria, and in view of the limited opportunities for the exercise of monumental design in London that have been offered during recent years, and the absence of useful precedents, this Special General Meeting of the Royal Institute of British Architects, of which her late lamented Majesty was patron throughout her long reign, respectfully urges upon the Executive Committee of the National Memorial its earnest conviction that designs should be invited in open competition from all British architects for this most important and unique monument, which, it hopes, would thus become representative of the best and most enthusiastic efforts of modern monumental architectural art. And further, this meeting would suggest to the Executive Committee the necessity of affording sufficient time for the preparation and submission of designs by architects resident in all parts of the Empire, of whom many are members of this Royal Institute."

As a member of the Council, he should like to say that the subject had not been before the Council in any form at all—no doubt, because the President had been selected to act on the Executive Committee, which was an honour done to the Institute, and a recognition of the Institute by those in authority, for which they ought to feel thankful. As to the action of the President on that committee, he thought they could all feel certain that whatever action the President had taken had been taken in the best interests of the dignity of the profession, and in what the President conceived to be the true interests of the Institute. The nature of that action the President had in no way revealed to them, and in that, of course, he was perfectly right, for he was a member of a concrete body and was not in a position without their authority to reveal what had taken place at their discussions. But the President had written them a letter which left it perfectly open to them to discuss with respect one or other of the courses which had already been before the committee. If a mistake had been made, surely that mistake must be rectified? They must not admit that because a mistake had been made officially it could not be rectified. He did not think that any one would thoughtfully assert that a mistake had been made in form or in manner by the committee; the mistake had been made in judgment and in judgment only, and if they confined their discussion to that point any decision they might come to would have more dignity than if they discussed at large the mistakes which they imagined had been made in other directions. With regard to the whole subject of competitions, it must be remembered that the Council of the Institute and its President had from time to time been most energetic in repressing the competition fever, feeling that it had been the cause of many disastrous ills. But there were occasions, and the Queen's memorial was an occasion, when competition could do good. Reasons for this he had indicated in the amendment, because he thought it well that they should be given in the expression of

opinion of the meeting. What they objected to in the competition system, and what the Council and the Competitions Committee objected to, was the abuse of the system; but they must not let their dislike of that abuse drive them to the opposite extreme and dam up the channels of originality. There was one point on which he knew the President felt strongly, and that was as to the enormous waste of money which the competition system caused the profession; but that objection did not apply in this case at all, for it was a case in which the lamp of sacrifice would be burnt very willingly. In regard to the possible success of competition in such a subject, it must be remembered that in monumental architecture there was very little basis in facts for stimulus to build upon. The conditions were of the widest character, and unless the mind was kept fertile, and kept on what might be called the imaginative plane, no success would be achieved. He would remind them of the competition which resulted in the only fine monument of our era, *i.e.*, the Wellington monument in St. Paul's. That was a monument about which sculptors and architects would agree, and that monument was the result of open competition, and he could not imagine any committee of selection having selected Stevens before he had produced such a splendid memorial. The fine monuments of the world had been the result of competitions, and he did not think competition should be stamped out in this case because it was abused in small particulars.

Mr. H. V. Lancheater seconded the amendment. Mr. Macvicar Anderson had said in his letter that the Institute should be the last body to move in the matter, but surely it was for the representative body of architects to take a lead in expressing an opinion on an architectural question. Where were the public to look if they did not look to architects in regard to a subject that was so largely architectural? They were surely right in expressing what they thought—not for the sake of architects, but for the sake of the public; for no one believed that the work which would be put in the memorial *con amore* would, in the financial result, represent more than labourers' wages. Architects would give of their best, because they would feel proud to do so, and they desired the competition to be an open one, so that every chance should be taken to secure the very best result. He was rather sorry to see in one of the building papers a letter, signed "F.R.I.B.A.," discouraging action in the matter—not discouraging action on the ground that action was undesirable, but on the ground that they did not wish to be associated with the gentleman who had taken the matter up. To take such a course was not a sportsmanlike way of attacking a question.

Mr. Woodward: The letter appears in a journal the editor of which is a member of the Council of this Institute.*

Mr. E. W. Wimperis supported the amendment, and said that some attempt should be made to put their proceedings that night above the plane of personality. There was a consensus of opinion in regard to the five selected architects, who, it was recognised, had done a great deal to raise the standard of architectural art. Beyond that, those gentlemen had helped to found a school of national architecture of which young men of the present day would in time be the exponents. Still, the official recognition of those five architects (which other architects did not grudge them in the slightest) was also an official rejection, for there were other names which they could think of which ought to have been included. The situation was a peculiar one, for anything that might be done in the matter must be done by the younger and comparatively unknown men, for those architects who by their position might make an effectual protest were obviously not able to make any protest at all. That fact indicated a possible criticism of the proceedings that evening, *i.e.*, that the protest was by young and unknown men. That criticism was to be met by the simple fact that those who could have helped by virtue of their position were unable to do so because

of the official recognition already made, and because they would be charged with personal enmity.

Mr. A. Frampton having made a few observations,

Mr. Maurice B. Adams said he agreed with everything that Professor Pite had said, but if that meeting carried a resolution, they would make a great mistake. It was no use hitting unless they hit hard, and unless they wanted to make themselves ridiculous they had better let the matter alone. The President of the Institute was a member of the Committee, and it was quite certain that he would do his utmost in the direction indicated that night.

Mr. Woodward said, as his only object was to secure open competition, he desired to withdraw his resolution and to support Professor Pite.

Mr. Silvanus Trevail protested against ignoring the Colonies in the matter. For his part, he would like the competition to be open to the world, and the best that the world could produce in art to be obtained.

Mr. Elkington said the Institute ought to lead public opinion on a matter of that kind. He could see no sufficient reason why there should not be an open competition, and he did not think they need feel they were on unsafe ground in passing the resolution.

Mr. J. Douglass Mathews said he thought there was a middle course. As five architects had already been selected, the Institute would put itself in a very invidious position if it took up an attitude against what had been done. He had drafted a short amendment, to the effect "that the proposed memorial to Queen Victoria be of intense interest to the people of the Empire, that, prior to the preparation of designs by the architects invited to compete, an opportunity should be afforded to any person so disposed to submit suggestions, either written or drawn, which shall be publicly exhibited, with the author's name attached." There ought to be every opportunity given to those interested to submit suggestions, and his proposal would make that possible, while it did nothing to reject the architects already selected.

Mr. F. Lishman and Mr. H. T. Bonner having made a few remarks,

Mr. A. W. Tanner said they were in a very awkward position. Their President was a member of the executive committee, and that committee was practically presided over by his Majesty the King. He did not think a formal resolution should be sent to the committee. He thought it would be better to have their views submitted to the committee by a friend in court.

Mr. E. W. Hudson said he hoped that that meeting would not consider what it was expedient to do, but what it was right to do. There were occasions on which a great Institute like theirs should rise above expediency, and express itself according to its convictions.

The Chairman then put Professor Pite's amendment to the meeting, and declared it carried by a large majority.

The Chairman said there was a precedent for what had been done by the King's committee, for at the time of the competition for the monument to the Prince Consort the same course was adopted; six architects were then invited to compete.

It was announced that the annual general meeting will be held on May 6.

The meeting then terminated.

On the 20th inst. a meeting will be held when a paper will be read by Professor Flinders Petrie, entitled "The Sources and Growth of Architecture in Egypt," and on June 17 Professor W. R. Lethaby will read a paper on "Education in Building."

The annual dinner will be at Glasgow on October 3.

BOARD SCHOOL, OPENS HAW.—The memorial stone of a new Board school was laid on the 27th ult. in Wheeler-street, Openshaw. This is the thirty-fifth school erected by the Manchester School Board, and it will provide accommodation for 1,400 children. The new building, which has been designed by Mr. Frank Edwards, architect, Manchester, will have classrooms on the ground floor for the infants' department and the first standard of the seniors' department, and the remaining standards will occupy the second floor. Manual instruction for boys will be provided in the basement; there will be a special room for drawing instruction, and a cookery-room and laundry area to be built apart from the main building. The contractors are Messrs. Young, Tinker, & Young of Cheetham.

THE SURVEYORS' INSTITUTION.

A MEETING of this Institution was held on Monday at No. 12, Great George-street, Westminster, when Mr. A. Clavell Salter read a paper on "The Ownership of the Highways," of which the following is an abbreviated report:—

The simplest and most ancient form of highway was the footpath, the right of public passage on foot only; the next, the driftway or bridle path, the right of passage on horseback or with pack horses, or, of course, on foot; lastly, the full highway, the complete right of passage in any manner, on foot, on horseback, or in vehicles. There was no difference in principle between these classes of highway, and the same rules of law governed them all. A considerable number of highways in this country were made in times comparatively recent under Acts of Parliament, such as Turnpike and Enclosure Acts. But, with these exceptions, all highways had their origin in a dedication by the owner of the soil of a right of passage over his land. Instances of such dedication were seen daily when new roads and streets were opened, and used by the public. In the case of ancient highways, it was, of course, impossible to say that any express dedication, or any actual dedication, ever took place. The highway had existed from time immemorial, and that is all that is known. In such cases the law assumed from the fact of public user that there had been at some time a dedication by the then owner of the soil. No highway, therefore, could be made without a voluntary dedication by the owner of the soil, except, of course, by the authority of an Act of Parliament. On the other hand, a dedication to the public once made could never be revoked, and a highway which had once come into existence could never cease to be a highway, except by Act of Parliament or the Order of Quarter Sessions. In a reported case a highway had been so long disused that large trees had grown where it formerly ran; but on the existence of the public right being proved, the trees were ordered to be removed and the highway to be reopened for public use.

Dedication, however, might be subject to limitations. A person who dedicated a highway to the public did not divest himself of the property in the soil. He continued to own the soil subject to the public right of passage over the surface. In the absence of express enactment, the property in the soil remained in the former owner. Thus, where waste of a manor, the property of the lord of the manor, was enclosed under an Enclosure Act, and highways were set out, the soil of such highways remained the property of the lord, unless the Act expressly directed otherwise. Most of the highways in this country were of great antiquity, and no record of their origin existed. In such cases it was presumed that the soil of the highway to the middle of the road belonged to the owner of the adjoining land. This presumption was applied in the construction of conveyances, where the land conveyed was stated to be bounded by a highway, and such conveyance was construed to pass the soil of the highway to the middle points, even though the measurements and the colouring of the plan did not include the highway, unless the other terms of the deed made it clear that the parties intended the highway to be excluded. This presumption as to ownership applied equally where the space between the enclosed lands was occupied entirely by a metalled road, and where the space consisted of a metalled road with strips of waste on each side. Where a highway runs between enclosed lands, the law presumes that the whole space from hedge to hedge is dedicated and forms part of the highway, although only a strip in the middle may be metalled. But, notwithstanding this presumption, it is probable that most of these roadside wastes were not originally any part of the highway. There was an ancient right, when the highway was foundrous, to pass over unenclosed land adjoining the highway; and in the days when highways were always bad, and often impassable, this right of deviation was of great value. The land over which this right existed was not part of the highway, and could be enclosed; but an owner who enclosed such land, and thus made deviation impossible, incurred a liability to keep that portion of the highway in a certain state of repair. To avoid this liability owners of unenclosed lands adjoining a highway, when they enclosed such

* The letter referred to was written by an eminent architect who has no sort of connexion with this journal, and in its original form was much more strongly expressed than what we actually printed; and we may point out to Mr. Lancheater that the first and most important point made by the writer of it was, that it was not dignified for the Institute to interfere in the matter; a view strongly echoed in Mr. Macvicar Anderson's letter read at the meeting.—Ed.

lands, left between their fence and the highway itself a strip of land over which the right of deviation might be exercised. Such was, probably, the origin of most of the roadside wastes which were, happily, so common a feature in this country.

Certain recent statutes had made important alterations in the ownership of the soil of highways, and had vested such soil, to a certain extent and for certain purposes only, in the highway authority. But subject to the special property thus conferred on the highway authority, all the former rights of the private owner of the soil remained in him. The owner of the soil of the highway could use and enjoy his property in any way not inconsistent with the public right of passage. The trees and herbage on the highway belonged to him. He could let the right of pasturage on the roadside waste. If cattle are not using the highway to pass along it, but were depastured on the roadside waste, he could maintain trespass against the person so depasturing them. He can resist any encroachment on the highway as an encroachment on his land. He can remove anything put upon the highway not necessary to aid or regulate the public right of passage, and this whether the thing were an obstruction or not. He might excavate under the highway, make a tunnel, take minerals, provided he does not interfere with the public right of free passage over the surface. In the absence of statutory authority no pipes could be laid in the highway, no posts erected thereon, and no wires carried over it, without the permission of the owner of the soil. This applied to the whole highway, whether metalled road or roadside waste. There might be a valid dedication of a highway subject to the right of the owner of the soil to plough it up in course of husbandry along with the adjoining land. And when a footpath had always been so periodically ploughed up, the dedication was presumed to have been so limited. In the case of *Arnold v. Blaker** a footpath had been so dedicated. The highway authority repaired the path with hard materials which made it impossible to plough it up. It was held that their act was a trespass upon the rights of the owner of the soil. The rights of the owner of the soil of the highway were further illustrated by cases in which persons had made improper use of the highway, and had then endeavoured to rely on the public right of passage. In the case of the *Queen v. Pratt*† there was a highway bounded on both sides by the land of one Mr. Bowyer, who was, therefore (as they had already seen), the presumptive owner of the soil of the highway. Thomas Pratt was seen on this highway with a dog and carrying a gun. He sent the dog into a covert next the highway. The dog drove out a pheasant which Pratt shot at. Pratt was charged with trespassing in pursuit of game on land in the possession and occupation of Mr. Bowyer. He had never left the highway, and relied on his right as a member of the public to use the highway. The court held that he was not lawfully using the highway to pass along it; that the highway was land in the possession and occupation of Mr. Bowyer; and that Pratt was guilty of trespass on that land in pursuit of game. Several other examples of a similar reasoning were cited. These cases showed how completely the rights of the owner of the soil of the highway were recognised by the law, subject only to the full public rights of passage over the surface.

On the other hand, the highway authority or any member of the public might remove any unlawful obstruction of the highway, or proceed by indictment against the person responsible for such obstruction. In view of these wide powers, many people probably asked themselves how the erection of telegraph posts in the highway, the excavation of the surface, and the constant obstruction of the right of free passage can be justified in law. It might probably be safely said that no such acts would nowadays be attempted without the express sanction of Acts of Parliament, public or private. He had next to refer to those statutes which had vested the soil of certain highways in the local highway authority, and had therefore, to the extent of such vesting, deprived the former owner of his property in the soil.

Within the metropolitan area the matter was governed by the Metropolitan Management Acts, 1855, which by Section 90 provided as follows:—“All streets being highways, and the pave-

ments, stones, and other materials thereof, and all other things provided for the purposes thereof by any surveyor of highways . . . shall vest in and be under the management and control of” the Local Highway Authority. As regards urban districts throughout the country the Public Health Act, 1875, Section 149, provided that “All streets being or which at any time become, highways repairable by the inhabitants at large within any urban district, and the pavements, stones and other materials thereof, and all buildings, implements, and other things provided for the purposes thereof, shall vest in and be under the control of the Urban Authority.” As soon as a street was made up and taken over by the Highway Authority, the soil of such street was divested from the former owner and vested in the Highway Authority. In rural districts, the only statutory vesting of highways was in the case of main roads, as to which the Local Government Act, 1888, Section 11, provided that main roads should be wholly repairable by the County Council, that an Urban District Council might claim to maintain a main road within their district, in which case the County Council shall contribute to the cost, and further that “A main road and the materials thereof and all drains belonging thereto shall, except where the Urban Authority retain the powers and duties of maintaining and repairing such road, vest in the County Council.” The result, therefore, was that in the metropolis and in all urban districts, the property in the soil of the highways was taken from the private owners and vested in the Local Highway Authority. In rural districts only the main roads were so vested, all other highways remaining vested as before in the private owners of the soil.

It would be seen that these statutes made an important distinction between the status of Urban and Rural Highway Authorities in regard to the highway itself. He proposed now to shortly consider the nature of the statutory property so conferred. The property in the soil of the highway which was thus given was not by any means so complete as that of a private owner. It was limited in nature and extent. The rights of a private owner of land extended to an indefinite distance above and below the surface of the soil. The rights of property of the Highway Authority under these statutes extended only to such depth as was necessary for the due maintenance and repair of the road, and only to such height as was necessary to enable them to prevent any obstruction to the traffic. Outside these limits, both above and below, the property remained in the owner of the soil. In the case of the Corporation of Tunbridge Wells v. Baird, in 1896, the Corporation were desirous of excavating and constructing lavatories under the surface of the well-known highway called the Pantiles. The highway was vested in them as the Highway Authority. They proceeded with the work, and an action was brought to restrain them by the person who owned the soil of the highway subject to the statutory vesting in the Corporation. The Corporation contended that, as the soil of the highway was vested in them, they were entitled as owners to excavate the lavatories. But the House of Lords held that their statutory property did not go so far, and that the excavation was a trespass on the rights of the plaintiff as an owner of the soil.

Again, in the case of the Wandsworth Board of Works v. The United Telephone Company, the Telephone Company had erected a wire across a London street, but at such height as not to impede the traffic or to cause appreciable danger to the public. The Board, as the Local Highway Authority, sought to enforce the removal of the wire. They contended that, as owners of the soil of the street, they had a right to object to anything being erected over their land at however great a height. A private owner could certainly so object. But it was held that their statutory property did not go so far, and that, as the wire did not impede traffic or endanger passengers, there was no infringement of the rights of the Highway Authority. If the private owner of the soil of this highway had taken action, he could probably have enforced the removal of the wire. These and other cases served to show that the ownership of the highway by the Highway Authority was very limited in extent as compared with the rights of an ordinary landowner. Moreover, the rights of an ordinary owner were perpetual, but if a highway ceased to exist as such, as by being lawfully stopped

or diverted, the property in the soil immediately ceased to belong to the Highway Authority, and reverted fully in the private owner.

The cases cited assisted in defining the nature and extent of the ownership of the soil of the highway by the Highway Authority. The tendency of the decisions was to restrict such ownership within very narrow limits, and to trench as little as possible upon the right of the private owner of the soil. The position created by these vesting sections is somewhat anomalous. There appeared to be something in the nature of a dual ownership. The private owner of the soil remained the owner. He remains the sole owner outside the narrow limits to which the statutory property of the Local Authority was confined. Within the limits of the property of the Local Authority the ownership of the private owner seemed to be in abeyance. It was certainly not extinguished, because, if the land ceased to be a highway, the rights of property of the private owner immediately came into full force.

STANDARDISING SIZE OF BRICKS.

A CONFERENCE between representatives of the Institution of Civil Engineers, the Royal Institute of British Architects, and representatives of brickmakers was held on Friday last week at the Building Trades Exhibition, Royal Agricultural Hall, Islington, to discuss the question of standardising the size of bricks.

Mr. Thomas Blashill, who presided, said that the meeting was the outcome of meetings of a Joint Committee of the Institute of Architects and the Institution of Civil Engineers appointed to consider what appeared to be a very important matter, viz., uniformity in the size of bricks. Great difficulties arose in building works because of the difference of size in bricks which had to be used together in the same wall. The Joint Committee had drawn up certain regulations which they thought might be adopted, but before going further with them they desired to hear the view of brickmakers and others on the subject.

Mr. H. D. Searles-Wood, the hon. secretary of the Science Committee of the Institute of Architects, then read the following statement of the standard suggested by the Joint Committee:—

“The standard suggested by the Joint Committee of the Royal Institute of British Architects and the Institution of Civil Engineers is as follows:—

1. The length of the brick should be double the width plus the thickness of one vertical joint.

2. Brickwork should measure four courses of bricks and four joints to a foot.

Joints should be $\frac{1}{4}$ in. thick and an extra $\frac{1}{8}$ in., making $\frac{3}{8}$ in. for the bed joints to cover irregularities in the bricks; this gives a standard length of 9½ in. centre to centre of joints.

The bricks to be measured in the following manner:—

Eight stretchers laid square end and splay end in contact, frog upwards, in a straight line to measure 72 in.

Eight headers laid side by side, frog upwards, in a straight line to measure 35 in.

Eight bricks laid, the first brick frog downwards, and then alternately frog to frog and back to back, to measure 21½ in.

This is to apply to all classes of walling bricks, both machine and hand made, and facing bricks.”

Mr. Searles-Wood also read letters on the subject from Messrs. Thomas Lawrence & Sons, brick and tile manufacturers, of Bracknell; Mr. E. Holwill, of London; and Mr. Arthur Harston, of London.

Messrs. Lawrence & Sons wrote that they quite agreed with the idea, but they pointed out that with regard to red bricks there were bound to be some bricks from the bottom part of the kiln that would be shorter than those from the upper part; in fact, to burn the darkest red colour it was necessary, or usual, to burn these bricks stood on end, and consequently the weight of the bricks above, and the heat of the fire below, made these often-times shrink nearly half an inch in length. As dark red was the most difficult colour to procure, they saw, as brickmakers, very serious objection to it being specified in contracts that bricks shall be of the standard size.

Mr. Holwill wrote that he considered the most simple rule to adopt would be that the size of bricks should be such that they should in the work run four to the yard and rise four to the foot, which would enable the quantity to be estimated easily at per foot super or per

* L. R. 6 Q. B., 433.

† 4 E. & B., 860.

ward super. That, of course, included joints—and naturally the width of a brick should be half the length less thickness of joint. The question then became one of the thickness of joint—and different classes of bricks required necessarily different thickness of joint. Glazed bricks and some classes of facing bricks required $\frac{1}{4}$ -in. joint, and the sizes of these would then be $8\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by $2\frac{1}{2}$ in. For bricks that required $\frac{1}{4}$ -in. joint the sizes would be $8\frac{1}{2}$ in., viz., $8\frac{1}{2}$ in. by $4\frac{1}{2}$ in. by $2\frac{1}{2}$ in. Personally, he had always worked on the above rule and found it adjust itself to the present requirements, giving less trouble than in cases where other size bricks have been introduced. The question of the thickness of the joint had in his experience been the greater source of trouble.

Mr. Harston wrote that if a uniform size could be effected to be recognised as a standard a very useful work would be done. The size he endeavoured to promulgate was $8\frac{1}{2}$ in. long, $4\frac{1}{2}$ in. wide, and $2\frac{1}{2}$ in. thick. He had had to reject very good stock bricks because the length exceeded $9\frac{1}{2}$ in. without any proportionate increase of width; but the maker took no interest in altering to proper size, as he could sell faster than he could make. On the other hand, he (Mr. Harston) had had red pressed bricks sent to build a 9-in. wall, fair on both sides, where two widths of the stretchers placed dry, side by side, without space for joint, exceeded by $\frac{1}{2}$ in. the length of the stretchers, and the brickmaker appeared to be quite unaware of the fact. He had to convince the brickmaker by asking him to experiment by building a dry 9-in. wall without having recessed headers, which, of course, he failed in attempting. Some of the Staffordshire blue-brick makers were especial sinners. They made a thin brick for the purpose of bonding with London stocks, but their bull-nose quoins were so short that they required a $\frac{3}{8}$ -in. wide vertical joint at the square end, which made very unsightly facing work. The sizes suggested by the Joint Committee were $\frac{1}{8}$ in. more each way than his figures, and left too tight a joint in heart of wall between stretchers, which joint should not be less than $\frac{3}{8}$ in. It was always difficult to get it flushed in; but he thought that a brick which was to be used only for facing might be $\frac{1}{8}$ in., or even $\frac{1}{4}$ in., more than his figures, so as to get a neat joint, and because, being more square and truer in its surfaces, less allowance had to be made for inequalities. But he was not an advocate for a very thin joint even in facing; given true bricks and good mortar, with sharp and perfectly clean sand, a $\frac{1}{8}$ -in. joint for beds was an excellent thickness—better than $\frac{1}{4}$ in., both for appearance and strength. There was the difficulty of making London stocks and true-shaped facing bricks exactly of the same dimensions. He thought there might be a rule that the latter should be thicker in each dimension by $\frac{1}{8}$ in. or $\frac{1}{4}$ in.—preferably, so far as he was concerned, by the $\frac{1}{8}$ in.

Mr. Joplin said that the difficulties from the brickmaker's point of view were easily got over in one sense, but not in another. The difficulty of altering the moulds or dies was not insurmountable, but there would be a great difficulty in burning the bricks so as to keep them to the standard unless the greatest care was taken in the selection of the clay. There was no difficulty, so far as he could see, in making a standard size for bricks; that was in the hands of those who specified, who could reject bricks which deviated from standard. One difficulty, however, was that in some districts two sizes of bricks were made—London sizes and north-country sizes. Another difficulty would be the apathy of a great number of brickmakers, who would not care what the standard was so long as they could sell their bricks. The thickness was not so important as the length and width, and he considered $8\frac{1}{2}$ in. by $4\frac{1}{2}$ in. to be a satisfactory standard size. He thought a committee should be appointed, consisting of architects, engineers, surveyors, contractors, brickmakers, and others, representing the views of the conflicting interests, who should decide what the standard should be. Then, if the various professions would specify that size, the main difficulty would be got over. The difficulty from the brickmaker's point of view was that of shrinkage, for in the case of a mould—say, for a 9-in. brick—the shrinkage might be as much as $\frac{3}{8}$ in.

Mr. H. W. Richards (Northern Polytechnic) said it mattered very little what the length was so long as a just proportion was kept between the header and stretcher, and that was the diffi-

culty. The Joint Committee apparently agreed to accept one splayed end to a brick, but bricklayers found a difficulty in laying bricks with splayed ends, and could that difficulty be got over? Was it necessary to have a splayed end in a hand-made brick such as an ordinary stock brick? As to shrinkage, no one could tell the amount of contraction that would take place in burning, and he did not think it could be provided against; and to get a perfect standard would be a very difficult matter. He thought it could be said that bricks should be made of a certain thickness, but as to length, so long as one standard was aimed at, if they could maintain the proportion between stretcher and header, a great deal of good would have been done. If a rule were made that bricks were to be a certain length, with no allowance for uncertain contraction, they would have to be sorted, and hence become more expensive.

Mr. J. C. Hill, past President of the Institute of Clayworkers, said he could well understand that there was great difficulty with wire-cut brickmakers as to getting a standard size; but the Fletton brickmakers had not the same difficulty, for they did not put that amount of moisture with their bricks that the slop-brickmakers did. The dry earth they used did not shrink, and they put their bricks straight from the machine into the kilns, and any shrinkage there might be could be fully gauged. It was true they had some difficulty in the wearing of the boxes, for all boxes naturally wore as they got a little old, and the die became smaller and the boxes a little larger. Of course, all the machines could not be put under repair at once, and the result was that the boxes differed slightly in size; but the variations were so slight as not to be worth consideration. He thought that architects and others might confine themselves to a standard size for bricks for all work, and leave it to the makers to produce what was required. If they did not produce the size they would lose orders—that was, if the architects would insist on having a brick that would bond.

Mr. G. Wragge, Chairman of the Kent and Essex Brickmakers' Association, said that as a somewhat large stock brickmaker, the term "slop" brickmaker was a little painful, and, on behalf of the stock brickmakers, he desired to say that the bricks they made were sand-faced stock, and were not slop-moulded at all. It was a question not of Fletton bricks or stock bricks, but whether brickmakers were to make a brick according to architects' specification. The brickmakers were quite capable of making any size or any shaped brick that engineers or architects might require, if architects or engineers would pay the price for it; but the fact was that the engineer required the very best brick he could get, and he wanted to give the very lowest price for it. Generally speaking, the further south one went, the smaller were the bricks, and it would be a great advantage if architects, engineers, and brickmakers would come to some understanding with regard to size. There was no great objection to the sizes proposed by the Joint Committee, for practically the London stock bricks nearly came up to the proposed standard; but if they were going to have eight stretchers to measure 72 in., was that size of 72 in. to apply to the hard, well-burnt, stock brick, or was it to apply to a brick which was "golden tinted in colour"? For, to get a hard and strong brick, a great deal more firing was required than in the case of the soft brick, and the size would vary according to the amount of burning. The brick which approached nearest to what was wanted was the stock brick and the Suffolk, and the brick which least approached it was the Fletton.

Mr. Bernard Dicksee, member of the Joint Committee, said that the Committee thought they ought to assume a size that was most in use at the present day, though they would have preferred 9 in. centre to centre of joint. They measured a large number of bricks and they found that nearly all of them were about 9 in. long, and it was felt undesirable to reduce the size, because they did not think that bricklayers would lay any more in the same time, and, if not, work would cost more. The Committee, therefore, selected $9\frac{1}{2}$ in. centre to centre as their standard. As to the difference in joints, according to the quality of the work, that had been taken into consideration in their method of measurement. For a rougher brick there was a thicker joint allowed because the most projecting portions would come in contact, and, therefore, to satisfy the measurement the bricks would really be slightly smaller. As to the

point of the last speaker, that the size of the stock brick would vary according to the amount of burning, that was one of the points dealt with by the Committee. He (the speaker) thought that the difficulty was that in many cases bricks were supplied as "stocks" that did not properly come under that description. He had had to condemn a large number of such bricks, which he called "shuffs." The difficulty, he thought, might be got over by kiln burning, which would burn them more equally.

Mr. S. G. Collier, of Reading said there were very few brickmakers present, and it would be impossible for those present to commit the others. The difficulty of one maker's bricks varying in size he did not suppose could be got over entirely, for the harder the brick was burnt the smaller it would be. It would be impossible to introduce a standard at once, but if they could get the opinion of the brickmakers of the country as to whether there was sufficient advantage in doing so, and whether they would be willing to do so, a step forward would have been taken. It would be a great advantage if all bricks were of the same size. He thought a brick ought to be rather less in width than half the length.

Mr. Goodenough, of Sittingbourne, said it would be impossible for all makers to enter into contracts for any considerable quantity of bricks of a stipulated size unless a price were paid that would enable them practically to throw away all those bricks which did not come up to the size required. They were face to face with the fact that it was practically impossible to recommend a specified size when makers from all the surrounding districts were supplying the London market.

The Chairman said perhaps the meeting might see fit to pass a resolution to the effect that it was desirable to get bricks as much of the same size as possible. They could hardly differ as to that; if they then formed a committee to decide what that size was to be, and if brickmakers were to do the best they could to supply the architect, engineer, and contractor with such sizes, that would help to get a standard size fixed. All manufacturers were standardising things now, and it was found a very useful thing to do.

Mr. Bates, teacher of brickwork at the Northampton and Chelsea Polytechnics, said that Mr. Richards had mentioned the real difficulty from the practical bricklayer's point of view. The bricklayer would produce good work if the width of bricks was made in proportion to the length. Brickwork was done cheaper in America than anywhere else, and was it not a fact that the brick there was smaller than the average brick in England? He would recommend the Committee, should they alter the size of bricks here, not to make them larger if they wanted the cost of the work kept down. He did not advocate any absurd size, but he might say that it was fatiguing to lay bricks, and as a practical bricklayer he could do more work with the South of England brick than he could with the North of England brick.

Mr. Hill said he would suggest that there should be a standard size for facing bricks and a slightly smaller size for inside bricks. That would give the bricklayer a chance of making a neat joint. They did not want to "hammer down" the inside bricks.

Mr. A. Saxon Snell said that was a retrograde suggestion. In building in cement it did not much matter, but the difficulty was that in building with ordinary mortar they had different sizes of bricks and different thicknesses of mortar, and that was unscientific. What they wanted was to get all the joints of the same thickness, and that should be done even with facing bricks. If they were going to have a gauge brick face they must have the wall built specially for it, and have it thick enough to carry the weight on the internal part of the wall.

Another speaker said that bricks were sometimes not made to specification, and if architects were to specify a certain size and brickmakers were to do their best to meet the requirements, the bricks which deviated from the standard could be disposed of to builders who had no specifications to work to.

Mr. Blizard said there was evidently great fear on the part of some brickmakers of being tied down to a specification of any kind, knowing, as they did, the limits of their material; for there would always be variation in the size of bricks manufactured, and the brickmaker would have great difficulty in a large job in meeting the requirements of an architect who

kept him closely to the specification. It would be a very good thing to have a standard fixed for the whole country, for the difference in shrinkage was a small point compared with the difference in the size of bricks North and South.

Mr. Searles-Wood then moved that a committee be formed to consider the desirability of making the size of bricks uniform all over the country.

Mr. Smart, of Notts, said he could see no objection to forming a committee as proposed. As a maker of wire-cut bricks and sand-facing bricks he saw no difficulty in having almost any standard size architects and engineers would agree upon, though he would prefer to make a smaller rather than a larger brick.

The motion, having been seconded, was put to the meeting and carried.

The Chairman said that Mr. Searles-Wood would enter into communication with gentlemen interested in the matter.

A vote of thanks to the Chairman concluded the proceedings.

THE MODERNISING OF THE COVENT GARDEN OPERA HOUSE.

The alterations recently made at Covent Garden may be taken in three groups:—

- I. Structural alterations for the audience.
- II. Structural alterations for the management.
- III. Equipment of the stage.

I.
Regarding the alterations for the audience, these comprise the remodelling of the exit and entrance arrangements of the stage and the formation of a special stalls corridor, so that the stalls, with their corridors, now form an independent whole, having their own conveniences, cloakrooms, &c., and do not, as formerly, have to encroach upon the accommodation of the pit-tier boxes, or the entrances and exits of other parts of the house.

Entering from the main vestibule, there are now two sets of swing doors into the stalls corridor. From this corridor there is a central entrance into the stalls, and one on either side (right and left). There are pass staircases from the other tiers to the stalls corridors, and a special extra exit to Floral-street.

It is needless to say that the rearrangement of entrances and exits to the stalls is of considerable importance in case of panic or fire, quite irrespective of their general convenience.

In connexion with the stalls alteration, the old-fashioned front and apron of the stage, which used to protrude into the auditorium, has been abolished, and the orchestra set closer to the curtain line. This will considerably affect the lighting arrangements of the stage and bring the "picture" more in accordance with modern ideas. It also leads to the arrangement of extra rows of stalls. Two new boxes have also been formed in place of the old entrances to the stalls from the pit-box tier.

A number of minor improvements have also been made in different parts of the house, although perhaps these do not call for any special comment.

The carriage approach from Bow-street has been improved by the formation of extra doors, so that two lines of cabs and carriages can now "pick up" and "set down."

The arrangements for the electrical illumination of the stage had naturally to be remodelled and elaborated to meet the altered circumstances, the whole of the plant installed some two years back, of course, being re-used. Similarly, the steam appliances, telephone, speaking-tube, and other minor technical installations to be found on a modern stage were remodelled. The system of gas lighting was entirely abolished, and similarly the system of limelight for special effects.

II.
The structural alterations for the management, at the back of the house, comprise a number of important items: an entire remodelling of the storage and wardrobe arrangements, as well as the equipment of new workshops.

In the first place, the large property shop, which used to be over the auditorium, has been accommodated on a large additional floor, erected over the whole of the back wing of the building. This back wing has been remodelled, and now contains fine suites of rehearsal-rooms, both for solo artists, for the chorus, and for the ballet, distributed on three floors, well lighted and aired, and equipped

with all modern sanitary arrangements, an independent staircase, and an independent exit. The entire wardrobe, dressmaking, and tailoring department has been housed on the south side of the stage, in suites of rooms comprising three upper floors, having two independent staircases and inter-communication by means of a hydraulic lift.

On the north side of the house a suite of one of the upper floors has been retained as an armoury, a second has been remodelled for storage purposes, whilst a third now comprises a fine set of offices for the stage department. Here, again, an independent staircase connects the various floors, and inter-communication is also obtained by means of a new hydraulic lift. Below the stage level on either side of the house the various suites of rooms have been remodelled and modernised as far as possible; one suite next to the stage entrance, for instance, comprising the offices of the fireman, stage mechanist, and electrician, all in close proximity to one another, and in close touch with the stage manager's offices by the independent staircase just mentioned, and with the stage by a pass stairs on the other. Even the stage door has been remodelled, inasmuch as the doorkeeper's office now has a small waiting-room, and an entirely separate entrance, with timekeeper's office, has been formed for the working staff, by which means the crowding of the stage-door will be reduced. The back portion of the stage has been separated off from stage level downwards, with the view of forming a large scenery store built on fire-resisting lines, and equipped with all the necessary racks for holding the "cloths" used in the usual repertoire. Similarly, in the back wing, an old store, formerly known as the "infrimary," has been enlarged and remodelled with the view of forming a "wing" store. In spite of these two modernised storage arrangements, the accommodation for scenery at Covent Garden is still necessarily of a very limited character compared with that of Continental houses, and must remain a source of constant anxiety and trouble to a management who produce an average repertoire of twenty-five operas in the short space of ten weeks.

III.

We now come to the great alteration of the stage, an enormous undertaking at all times, but rendered particularly difficult owing to the short period available, the existence of a ball season during the major part of the winter, and the presence of an enormous stock of scenery, &c., which it would have been impossible to have moved out of the house except at a very great cost.

The alteration of the stage comprised entire gutting from top to bottom, so that nothing of the old stage from "gridiron" to cellar remains, with the small exception of a couple of wood fly galleries. Further, the alteration comprised the entire unroofing of the stage, raising the structure by 20 ft., and re-roofing on modern lines. Further, it involved a considerable amount of excavation work, with a view of forming deep pits to take certain parts of the mechanism. An entirely new "gridiron" had to be constructed right across the stage; two "gridiron" galleries had to be constructed on either side, and a number of light connecting ways running across the stage. An entirely new stage, including all constructional parts, had to be provided, together with a mezzanine floor. The opening of the stage towards the auditorium had to be equipped with an enormous fire-resisting curtain (the largest in London), and a strong party-wall built from stage level downwards into the cellar. In connexion with this constructional work, the whole of the "gridiron" galleries, stage, and mezzanine had to be re-floored, and the entire cellar or superficial area of the stage concreted over. The scene docks on either side of the stage had to be remodelled, one of them, for instance, being equipped with a large scene door with revolving shutters, measuring 28 ft. in height, another being provided with several floors to take planned scenery, such as rocks, groups, &c. The exit and entrance arrangements of the stage also had to be remodelled in such a way as to allow of greater convenience, and for the greater safety of the employes in case of accident.

In connexion with the constructional alteration of the stage, an entirely new stage equipment had to be provided on modern lines, everything above stage being now worked on the Brandt patent counterweight system, and

everything below stage on the Sachs patent electrical bridge system.

Without entering into detail, the stage may now be described as comprising a series of six horizontal sections running parallel with the curtain line from front to back, each section being 8 ft. wide, and the whole being followed by a large back stage or rear stage. The first section contains nothing but a plain "carpet cut" and openings to take the old-fashioned "grave" trap, "star" trap, or other similar contrivances. The second and third sections comprise large bridges, which can be raised 6 ft. above the stage, or lowered 8 ft. below the stage, constructed in two levels, on the lower level of which appliances can be installed for the purposes of raising minor platforms above stage level, or sinking traps and the like. The fourth, fifth, and sixth sections comprise large bridges running right across the stage front, which can be raised 6 ft. above the stage, or lowered 8 ft. below. The back stage has no openings or mechanism, beyond certain trapdoors to a scenery store and the necessary electrical mechanism for raising and lowering scenery for storage purposes.

Between the various sections of the stage, long longitudinal flaps, 2 ft. wide, have been formed, and these can be easily opened to allow scenery to be passed through below for transformation scenes and the like. Each section is equipped with what is termed a pair of chariots, to hold "wing" lights placed on so-called wing-ladders. All the electrical bridges are worked from mezzanine level and from ordinary switch boards, and can be raised and lowered at various speeds, and take loads up to two tons. They can be moved without vibration or noise, at a cost of about $\frac{1}{4}$ d. for power on a full rise when loaded.

Above the stage level, each section has its series of lines to take cloths, borders, &c. Each section has a batten, from which the electric battens are suspended; and each section has a large wooden lattice girder from which heavy pieces of scenery can be suspended. There are, on the average, about ten lines for ordinary battens, a girder batten, and a light batten to each section; besides these lines there are the equipments of flying apparatus and the like, whilst in front there are, of course, the necessary lines for tableaux curtains, act-drops, and draperies. Everything that is suspended from above can be worked at stage level, or at either of the gallery levels, every scene being counterweighted to a nicety, and one man can easily handle any scene. No mechanical contrivance is required, and in practice quite a number of scenes can be rapidly changed in a minimum of time.

Throughout the structure and mechanism steel has been used, iron pulleys, and wire cable; and the inflammable materials have been absolutely reduced to the flooring of the gridiron and galleries and the hard wood flooring of the stage and mezzanine. In other words, an absolute minimum of inflammable material replaces what was almost a maximum, and, seeing that the electric light has been installed, the risk of an outbreak of fire or its spread has been materially reduced.

The work was carried out under the direction of Mr. Edwin O. Sachs, architect to the Theatre Syndicate, Mr. Thomas Kissack acting as clerk of works. The general contractors were Messrs. Colis & Son. The ironwork contractors for everything above stage level were Messrs. Lindsay Neal & Co., Limited, whilst the entire complicated structural and mechanical ironwork below stage level, including the stage "bridges" and lifts, was by Messrs. Drew-Bear, Perks, & Co. The electrical power plant for the "iron" machinery was provided by the Thames Ironworks Shipbuilding Company, Limited, of Blackwall; whilst the whole of the elaborate counterweight mechanism above stage level was provided by the Berlin stage mechanist and contractor, Mr. F. Brandt, who personally attended to the installation of his appliances in London.

The fire-resisting curtain was by Messrs. Merryweather & Sons, Limited, and the alterations in the auditorium by the Army and Navy Auxiliary Supply, Limited (manager in charge, Mr. Player).

The building operation is the second structural improvement to the Opera House undertaken since its ownership, dating from spring, 1899; and this second building operation has involved the further considerable outlay of approximately 25,000*l.*, or, by way of comparison, the cost of the total erection and equipment of a provincial playhouse.

THE ART UNION OF LONDON.

The annual general meeting of members of the Art Union of London was held on Thursday last week in the lecture hall of the Society of Arts, John-street, Adelphi, to receive the report of the Council and for the distribution of prizes of works of art for the year 1900-1901.

We print the following extracts from the report of the Council:—

"The year just closed has been one of average success, and after setting aside the sum of 1,318*l.* for engravings, &c., the Council have been able to devote 544*l.* to prizes, making, with the consolation prizes awarded during the year to unsuccessful members of ten consecutive years' standing, a total of 207 prizes. Among the works of art specially selected by the Council for prizes are:—original oil painting, 'The Meadow Pool' (48 in. by 30 in.), by J. Clayton Adams; two bronze copies of the Chantry bust of Queen Victoria; six terra-cotta copies of 'The Jester' statuette, by Mr. George Tinworth; six electro-bronze copies of the statuette 'Hebe,' by Miss Ruth Canton; six framed sets of electro-silver album mounts, by the late Miss Simpson; six dragon jugs in Copeland ware; twelve blue reppsoué Douillon eners; fifty bound sets of 'Scenes from English History,' after designs for Westminster Palace.

As the presentation picture for the forthcoming year the Council have commissioned Mr. W. Wyllie, A.R.A., to etch a plate representing the naval pageant in the funeral ceremonies of her late Majesty Queen Victoria.

The Council are glad to be able to state that the number and value of the oil and water-colour drawings selected by subscribers during the past twelve months from the permanent exhibition in the Society's gallery has been more than double that of any preceding year. The increasing demand for fine specimens of steel engraving, now a practically extinct art, gives a new importance to the Society's collection of steel plates—probably one of the best and most extensive in the world. There are no more perfect examples of the art of Lumb, Stocks, Sharpe, Willmore, Goodall, and other leading engravers of their time—and it was the golden age of English line-engraving—than those by which they are represented in the Art Union gallery; and since, from the durability that can be given to a copper plate by steel facing, it is in the highest degree improbable that the costly and laborious process of engraving upon steel will ever come into general employment again, the existing fine examples of the art must become more and more valuable as time goes on. As a result of the deliberations of the advisory Council for Art appointed to reorganise the system of education at the Royal College of Art, many important changes have been made. In the new scheme the number of students is limited to 350, of whom 150 may be paying students. The College is divided into an upper and a lower school, each of these again divided into four sections: (1) Ornament and Design, (2) Drawing and Painting, (3) Modelling, (4) Architecture. An interesting decision may also be noted—that in future the diplomas of the College will not be awarded solely on the results of examinations; but that the Council of Advice and the professional staff will take into account the special aptitude of a student, not merely for the practice of art, but for teaching its principles and methods to others. Mr. Augustus Spencer retains the beadmastership of the College, and Mr. Lanteri the Professorship of Sculpture and Modelling; Mr. Beresford Pitt is appointed Professor for Architecture, Mr. Gerald Morda for Painting, and Mr. W. R. Lethaby for Design. The same committee of eminent artists which acts as a Council of Advice to the Royal College is entrusted with the function of advising in the matter of purchases for the Victoria and Albert Museum."

The report also stated that Lord Windsor has been elected as President.

In the drawing for prizes, the principal prize, 'The Meadow Pool,' by J. Clayton Adams, was won by Sir Thos. Lucas, Bart., of London.

BUILDING TRADE, STAFFORD.—The building trade is fairly maintained, the operatives generally are well employed, but the principal builders are not very busy. The County Council are enlarging both the County Council buildings and the technical school buildings. The local Corporation, at their monthly meeting on the 25th ult., sanctioned a contract for thirty-one new cottages, or 6,050*l.* In the case of the cottages referred to we are informed that none of the local builders belonging to the National Builders' Association tendered, owing to the Corporation declining to supply them with quantities.

MARBLE HALL, DE KEYSER'S HOTEL.—In our account last week of the work just carried out at this hotel we stated that the electric fittings were by Messrs. Bennett. It should have been Messrs. W. A. S. Benson & Co., Limited, of New Bond-street.

HOW IS THE FUTURE WORKMAN TO BE TRAINED?*

THE best method of training young workmen has become a burning question, especially in the building trades, for it is generally admitted, by those qualified to form an opinion on the subject, that the skill in handicrafts displayed by the workmen of the present time compares very unfavourably with that of the workmen of a quarter of a century since; various attempts to arrest the deterioration have been made, but apparently without much success. It occurred to me that the Institute of Certified Carpenters numbers in its ranks many men pecuniarily qualified, in virtue of their position and experience, to give opinions of value upon this question, and it is with a view of eliciting those opinions that I venture to lay before you the outlines of a scheme that may possibly furnish the solution to the problem propounded in the title of this paper. Before dealing with the proposition it will be as well to briefly summarise the conditions governing the training of young workmen formerly and to compare them with present conditions, and although these remarks are confined more particularly to carpentry and joinery, the broad facts are equally true in regard to other trades. The custom that used to obtain in old-fashioned workshops for training a boy entering these trades was to place him practically under the control or in charge of a good workman, usually the oldest or ablest hand in the shop, whose "bench-mate" he became. From this man the embryo carpenter and joiner learned the rudiments of the craft, partly by instruction, but chiefly by observation and imitation of his preceptor's methods, and if fortunate in ingratiating himself, he would be initiated into the personal "wrinkles" or trade secrets that were the especial possession of the old-time, experienced handicraftsman. But with the alteration in the methods of production introduced by machinery all this was changed; gradually the skilful handworker—the man who could take a rough drawing and translate it unaided into a highly-finished piece of work, or who could be entrusted to carry out successfully anything that might come to hand in the way of joinery—has disappeared, and the joiner of to-day is to all intents and purposes simply an accessory to a machine; and in most cases he is necessarily subordinate to the latter, not even being practically acquainted with its manipulation, which is entrusted to a special operative.

The machines produce parts of a whole with enormous rapidity and wonderful precision (subject, of course, to the ability of their operators), but as no single machine will complete any entire fitting, the chief duty of the modern joiner is to fill in the interstices, if I may so term them, between the several productions, and to adjust and fit up the various parts so prepared. All the expertness and knowledge which his prototype gained in the actual preparation of the several portions is denied the worker under the present system, which has thus developed a type of narrow specialising having an extremely limited range of usefulness; and, consequent on the want of general knowledge of construction inevitably displayed by workmen so restricted, further specialising has become necessary, and in this direction the latest product of the system is the "setter-out," a workman who confines himself to the drawing or marking out of the sizes of the several pieces preparatory to machine operations, and thus even the insight into the methods of construction which this work entails, with its educating influence on the mind, is withdrawn from the workman; and the result of such irresponsible deadening, monotonous, unthinking toil is to be seen in that apathy, want of intelligence, and carelessness with which the modern workman is charged. It is obvious that in the continuance of such a system matters will go from bad to worse, from the point of view of good handicraft. As the leaven of the old-time workman gets exhausted, so the whole mass will settle down to deeper ignorance of their craft; and to place boys into such workshops and under such influences, and to expect them to acquire a comprehensive knowledge of the trade, is absurd; and the question arises, How is such knowledge, then, to be imparted? It would

be worse than useless to suggest even a curtailment of the use of machinery, the tendency of the age being to substitute the latter for hand labour wherever possible; so if we cannot remove the initial cause of the mischief, we must counteract its ill effects by an antidote suitable to the conditions. It may be deduced from the above premises that to obtain a craftsman at once skilful, intelligent, and resourceful, the youth must be educated in, or made practically acquainted with, the whole of the craft which he is learning; not necessarily to be equally expert in all its branches, but to have sufficient general experience to enable him to successfully negotiate any unfamiliar work that may come to his hand. In workshops where machinery is employed, the acquirement of such knowledge is, as I have pointed out, practically impossible. There is no opportunity for instructing lads, unless a man is told off specially for the purpose, a method too expensive to be feasible, as in large establishments every man has his allotted work to perform, which is so interwoven or dependent upon that of others, that if it be neglected or delayed the whole establishment is more or less thrown out of gear. And most employers of labour, having realised the futility of attempting to teach trades in the workshop under present conditions, have abandoned the system of talking apprentices, with the consequence that whilst they are crying aloud for skilled workmen, boys are seeking in vain how to enter and learn the trade.

Attempts to remedy this state of affairs have been made by several public bodies, some dealing with boys before they enter a trade, and others after they have gained admission. The former necessarily confine themselves to the inculcation of the broad principles of precision and method underlying all trades, and also a little elementary instruction in the use of tools, &c.,—excellent in themselves, but not sufficient to make a boy of immediate service in any trade, which is now the only key to entrance of the workshops of reputable firms. Of the latter, the most noteworthy are the Trades Training Schools of the Worshipful Company of Carpenters. These are probably the nearest approach to a solution of the problem that has yet been attempted, and, but for a difficulty incidental to the system, would doubtless provide a sufficient remedy. I cannot for obvious reasons say all that I should desire to in praise of these schools, and in drawing attention to the one serious obstacle in the way of their complete success, I do not intend to reflect in any way upon their value as a means of improving the knowledge and skill of those already engaged in the trades by supplementing their workshop experiences, but rather to indicate the direction in which they could be made even more useful. To render these remarks clear, I will briefly outline the routine work of my own class, the result of several years' experience, and which is fairly typical of the methods pursued in the other trade classes. The workshop is fitted similarly to that of a first-class builder's, with practically every necessary tool used in the trade, and drawing apparatus are provided in addition; the work done is nearly all made full size, and under much the same conditions that obtain in a good-class hand shop. Lectures are given weekly, explaining the principles underlying the practice of the trade and their application in various familiar subjects. One night a week the student is instructed in, and practises workshop drawing; and once a week he is engaged in practical benchwork; the method generally pursued with respect to the younger lads being to instruct them first in the correct formation of framing, &c., more particularly those things that are now generally executed by machinery; and when these have been accomplished successfully, to entrust them with a complete piece of work, which includes the components they have already mastered in detail. This is made either full-size or to large scale, and the youth going steadily through this course gains in manipulative experience and constructive knowledge. The above routine does not apply to the men's classes, which are treated somewhat differently, but as these are beside the subject we are now considering, I will not trouble you with their details. The course I have described, you will probably agree provides a very complete preliminary training when it can be carried out in its entirety, but unfortunately it seldom can. The weak point

* A paper read on the 13th ult. at the monthly meeting of the British Institute of Certified Carpenters at Carpenters' Hall, by Mr. G. Ellis, Instructor at the Trades' Training School. The President, Professor T. Roger Smith, occupied the chair.

in this method is the continual interruption in the attendance, brought about by circumstances which are mainly, I am convinced (by the numbers of apologies received), beyond the student's control. The weekly interval arising between the cessation and resumption of work is a quite sufficient tax on the lad's memory, about instructions he has received, and when this interval is prolonged to from three to five weeks, as not infrequently it is, it is obvious that all such instruction must be repeated, to the occasion of much waste of time and interruption to the work of others. Added to this, another drawback to classes held in the evening is that they necessarily lengthen the day's work, already sufficiently long in most cases. The alternative I propose is, the establishment of an apprentice school (or series of schools) in industrial centres in connexion with the firms or workshops in the neighbourhood for the training of boys in the various trades, on lines similar to the Carpenters' Company's School but carried on during ordinary working hours. A boy desirous of entering any trade would be apprenticed as it were to the school instead of as formerly to an individual master for a stated period; he would become party to an agreement which would bind him to attend regularly daily from, say, 9 a.m. to 5 p.m., with the usual interval for meals, throughout the first year of his term, during which he would obtain continuous practical instruction of the best kind from properly qualified workmen, and also acquire methodical habits, and be subjected to a wholesome restraint, that can seldom be exercised in the ordinary workshop, but which would be of incalculable benefit to him in the future. From the school, as opportunity offered, he would be drafted into the workshop of one of the firms connected with the scheme, well-grounded in the rudiments of the trade, and familiar with the use of tools, and where his services could be at once utilised, to the advantage of his employer. During the second year of the term he should attend the school for further improvement, either three consecutive mornings, or three afternoons, per week, as might be the more convenient to his employer; the latter, having now become party to the agreement, being compelled by its terms to provide the necessary facilities for his attendance, the remainder of the lad's time being spent in the employer's service under the usual conditions governing the trade. For the third and fourth years the apprentice should attend one afternoon per week, in which he would practice more advanced work, and finish off his education as an operative. Further theoretical and practical instruction should be open to him to enable him to qualify for advanced positions, but not be compulsory. This could well be supplied in the voluntary evening schools such as those of the Carpenters' Company. The course of training thus indicated, combining the theoretical and expert instruction of the school with the everyday experience of a competitive workshop, would, I am confident, produce artisans equal, if not superior, in skill and adaptability to those of former generations in less time, and therefore more economically, than the old method of personal apprenticeships.

The organisation, provision of funds, and limitation of numbers in such schools are points upon which there will probably be diverse opinions, and in offering the following suggestions, I rather indicate a possible arrangement than attempt to formulate a definite policy.

Expenses.—These could be largely met by: 1. Contributions on the part of parents, in the shape of smaller ones, be made payable by instalments; and 2. By contributions from the firms assisting in the scheme. These might take the form of a money grant, equal to the expense of training a boy in their own works, or in kind, as tools, materials, &c.; also by the purchase, at an agreed price, of such of the work made in the school-shop as would prove serviceable to them, what may be termed stock sizes and articles being made to that end. Of course especial care would have to be taken by the management that this method of raising income did not lead to any abuse of the system. Further, other employers, not parties to the scheme, but who might be desirous of obtaining qualified apprentices, could be asked to pay a specified sum bearing some relation to the commercial value of the apprentice chosen. In addition to these sources of income grants might be obtained from the funds pro-

vided by taxation for the furtherance of technical education, as the proper training of workmen is undoubtedly a national question.

Management.—This probably offers the most difficulty, but the scheme as outlined above will, at least in its initial stages, have to be carried out voluntarily, and those taking the lead in the preliminary formation will arrange this to meet their requirements; afterwards experience will indicate the best method to pursue.

To obtain the confidence of both employers and workmen the directorate should include representatives of each body, also representatives from any public body willing to give its adhesion to the scheme. Architects should be represented, as they perhaps more than any others are interested in the production of capable workmen.

In conclusion I ask for your impartial criticism of the scheme outlined, which has purposely been kept free from detail, for such a variety of interests being involved, the latter is essentially a matter for collective council. I have anticipated, however, two possible objections that may be raised, and with the view of facilitating discussion, will state and reply to these before finishing.

It may be asked—Is it necessary to train youths to handwork if machinery is to supplant the same in the near future?

I would reply yes, unhesitatingly, for three reasons. 1st. The further introduction of machinery will be retarded by a supply of skilled handworkers, as, especially in the joinery trade, it is chiefly the dearth of the latter that makes it profitable to employ machinery, and it is opposed to the best interests of the trade, and also to the nation, that there should be persistent deterioration in skilled handicrafts. 2nd. In addition to the large establishments which increasingly use machinery, there are great numbers of smaller firms throughout the country who are often better supporters of good workmanship than their bigger competitors, and these depend largely upon handworkers, and will, if the supply continues to decrease, be absorbed the sooner, to the detriment of the trade. 3rd. The more extensive a man's capacity, the more readily will he find employment when one or other branch is over supplied, and thus prevent a general reduction in wages, which tend to fall automatically when there is any considerable excess of supply over demand in the labour market.

How is the overstocking of a favoured trade to be prevented?

The law of supply and demand would govern these institutions just as it does the present workshops; and, as a matter of fact, the directors would be in a better position to gauge the demand than are the parents under present conditions. Further, the institution could be the means of finding out the capacities of boys for certain crafts, and, by drafting them into those for which they were best suited, prevent the manufacture of "bunglers." This might be managed by providing for a short probationary course on entry, during which each boy should pass through the hands of various instructors, who would report upon his ability, and from these reports the management would deduce which trade he showed most aptitude for, and, provided there was an opening, he would be advised to follow up this particular trade, or, if conditions were not favourable, then the next one for which he seemed most fitted.

How and where would you organise your schools?

Probably it would be best to make a trial with one first, and if the venture were successful, others would be established where there was a demand.

The Carpenters' Company's Schools occupy a very central position in London, easy of access from all parts, and already possess the nucleus of an equipment and organisation such as is required.

I have, of course, no authority to state that the company would assist, but I feel sure, from the great interest that they have displayed in everything concerning the welfare of the trade, that if they were convinced that the scheme had the approbation of the building trade, they would not place any obstacles in the way of those wishing to give it a trial. Possibly they might be induced to take the initiative if they received guarantees of assistance from master builders; that they would from parents goes without saying.

THE LONDON COUNTY COUNCIL.

The London County Council re-assembled on Tuesday after the Easter recess, at the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 3,515*l.* for brick sewer works; Shoreditch Borough Council 13,740*l.* for purchase of land, paving works, and erection of loose box at the wharf; Battersea Borough Council 10,600*l.* for electric-light installation and 3,230*l.* for provision of disinfecting station; School Board for London 37,669*l.* for schools; St. Pancras Borough Council 830*l.* for lighting of public buildings by electricity; and the Metropolitan Asylums Board 1,440*l.* for the purchase of land.

A City Street Improvement.—The Improvements Committee brought up a recommendation in favour of the Council contributing 16,800*l.*, one-half the net cost of the widening to 50 ft. of Blomfield-street, City, between East-street and Eldon-street, proposed to be undertaken by the City Corporation.

An amendment moved by Mr. Austin and seconded by Mr. Hubbard, to postpone the consideration of the subject was rejected by a large majority.

Dr. Cooper then moved that the recommendation be referred back, and contended that the City ought not to come to the Council for contributions towards City improvements until they brought up their assessments to a proper level.

Mr. Radford seconded the amendment, and said it was a great evil that the City should escape its proper obligations.

Mr. Davies, chairman of the committee, said they were unanimous in their recommendation, which would secure the completion of an improvement two portions of which had already been carried out.

The amendment was rejected, and the recommendation was adopted.

Purchase of a Motor-car.—The Fire Brigade Committee recommended the purchase, at a cost of 280*l.*, from the Locomobile Company of America of a motor-car for use by the Fire Brigade.

Mr. Beachcroft objected to going to America to purchase the car when any number could be obtained at home.

Mr. Gilbert said the Chief Officer had recommended that particular type of car.

The recommendation was adopted. *Theatres, &c.*—The Theatres and Music Halls Committee recommended as follows, the recommendations being agreed to on certain conditions:—

"That Mr. Matcham be informed that, provided the works shown on the eight plans submitted by him in regard to a building to be known as the Hackney Empire, and to be erected with frontages to Mare-street, the Grove and Grove-passage, Hackney, are commenced within six months, the Council will be prepared to grant a certificate under Section 12 of 41 and 42 Vict., cap. 32, to the owner of such building.

That Mr. Collard be informed that the Council has no objection, so far as its regulations under Section 12 of 41 and 42 Vict., cap. 32, are concerned, to the arrangements shown on the plan submitted by him in regard to the new offices at London Exhibitions.

That Mr. Verner be informed that the Council has no objection, so far as its regulations under Section 12 of 41 and 42 Vict., cap. 32, are concerned, to the arrangements shown on the plan submitted by him in regard to the military tournament at the Royal Agricultural Hall.

That Mr. Caroe be informed that, provided the works shown on the five plans submitted by him in regard to a building to be known as the St. James's Parish Hall, and to be erected at St. James's, Upper Clapton, are commenced within six months, the Council will be prepared to grant a certificate under Section 12 of 41 and 42 Vict., cap. 32, to the owner of such building."

Greenwich Tunnel.—Progress of the Works.—The Bridges Committee reported as follows:—

"We desire to call the attention of the Council to the progress that has been made in the construction of the Greenwich tunnel. The Greenwich shaft of the tunnel was sunk to the required depth on March 19 last, but little permanent work was done during the remainder of the month. The invert of the shaft is now being filled with concrete under compressed air at about 25 lbs. pressure. At the end of March the face of the tunnel was 842 ft. from the centre of the Poplar shaft, or more than two-thirds of the entire distance to the Greenwich shaft, and during the month a length of 260 ft. was completed. Since February 22 last the work has advanced 10 ft. every working day, which is an un-

precedented achievement in sub-aqueous tunnelling. The material passed through has been chiefly clay and close sand. The air pressure has varied from 19 lbs. to 25 lbs., and the weekly analyses of the air in the tunnel show a very satisfactory purity of the atmosphere. The estimated value of the permanent work executed up to the end of last month is 65,626*l.*, or about 60 per cent. of the contract amount."

Greenwich Tunnel, Electric Lighting.—The same Committee recommended and it was agreed that the offer of the Council of the Metropolitan Borough of Poplar to supply electricity to the Greenwich tunnel at 18*d.* per unit upon an estimated minimum quantity of 100,000 units per annum be accepted.

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:

Lines of Frontage and Projections.

Peckham.—A four-story block of residential flats, with shops on the ground floor, and a scene-dock at the rear, on the north side of High-street, Peckham, at the corner of Stairford-street (Mr. A. Stuart for Mr. H. T. Holdron).—Consent.

Norwood.—A public hall and houses with shops on the west side of Norwood-road, Norwood, to be also upon, Ulleswater-street, York-road, and Harpenden-street (Mr. J. S. Quilter for the freeholders).—Consent.

Clapham.—A two-story house, with a shop and gateway on the ground floor, on the site of No. 74, Southville, Wandsworth-road, Clapham (Messrs. H. Wakeford & Sons for Mr. G. Taylor).—Consent.

Lewisham.—A church on the east side of Trewsbury-road, Sydenham (Mr. G. H. Fellowes-Pryne for the vicar and churchwardens of Christ Church, Lower Sydenham).—Consent.

Dulwich.—A projecting wood and tile pent over the entrance to a dwelling-house on the south-west side of Townley-road, East Dulwich (Mr. F. A. Clark for Mr. W. A. Bois).—Consent.

Finsbury, East.—An entrance porch and three six-story projecting windows in front of Cocker's Hotel, Charterhouse-square, Finsbury (Mr. E. Haslehurst for Messrs. Wheeler & Warren).—Consent.

Hammersmith.—A one-story shop on the forecourt of No. 228, Uxbridge-road, Shepherd's Bush (Messrs. Holcombe, Betts, & West for Mr. J. Vellener).—Consent.

Hampstead.—An addition to No. 24, Belsize-grove, Hampstead (Mr. C. J. Strachan for Mr. G. R. Simmons).—Consent.

Hampstead.—Wooden hoods covered with lead at the entrances to Nos. 27 and 28, Lyndhurst-road, Hampstead (Mr. W. A. Burr for Mr. J. Tomblin).—Consent.

Lewisham.—That the application of Mr. A. Stuart for an extension of the period within which the erection of one-story shops on the west side of Catford Hill, Lewisham, at the corner of Ravensbourne Park, adjoining the arches of the London, Chatham, and Dover Railway Company, was required to be commenced, be granted.—Agreed.

Marylebone, West.—A two-story addition in front of No. 47, Hamilton-terrace, St. John's Wood, Marylebone (Mr. L. Solomon for Mr. H. J. Waldorf).—Consent.

St. Pancras, South.—A two-story oriel window in front of No. 167, Tottenham-court-road, St. Pancras (Mr. A. Whitehaw for the London and North-Western Railway Company).—Consent.

Wandsworth.—A one-story coal-order office building on the north-west side of Mitcham-road, Tooting, at its junction with Longley-road (for Messrs. R. Reid & Co.).—Consent.

Wandsworth.—Retention of a wood and slate porch at the entrance of No. 16, Abbotstone-road, Putney (Mr. H. G. Leslie for Mr. T. Osment).—Consent.

Hackney, South.—Residential flats, with shops on the ground floor, on the site of Nos. 112 to 120 (even numbers only, inclusive), Lower Clapton-road, Hackney, at the corner of Laura-place (Mr. H. Riches for Messrs. W. H. Tilley & Co.).—Refused.

Kensington, North.—An addition to No. 47, Lambrook-square, Notting Hill, to be upon Kensington Park-road (Mr. C. R. R. Clark for Dr. G. L. Turnbull).—Refused.

Kensington, South.—An iron and glass covered way at the entrance to No. 3, Pembroke-road, Earl's-court-road, Kensington (Mr. R. Phené Spiers for Mrs. Pidgeon).—Refused.

Lewisham.—That Mr. W. C. Green be informed that the Council is not prepared to accede to his request for permission to retain a shed at the side of No. 108, Catford Hill, in advance of the general line of buildings in Beechfield-road.—Agreed.

Marylebone, East.—An iron and glass covered way at the entrance to Bechstein Hall, No. 36, Wignore-street, St. Marylebone (Mr. T. E. Colclutt for Mr. E. Bechstein).—Refused.

Strand.—A projecting metal sign at the Peninsular and Oriental Steam Navigation Company's premises on the north side of Northumberland-avenue, Charing Cross (Mr. T. E. Colclutt for the company).—Refused.

Width of Way.

Bethnal Green, North-East.—Twelve houses on the south side of Prospect-terrace, Usk-street, Bethnal Green, at less than the prescribed distance from the centre of Prospect-terrace (Mr. A. P. Stokes for Mr. C. Lacey).—Consent.

Greenwich.—That the request of Messrs. Potheary & Co. for the Electric Timber Seasoning and Preservation Company, Limited, for permission to retain the forecourt fence in front of a building distance from the south side of River-side, Charlton, between the Albion Chemical Company's works and the silicate works, at less than the prescribed distance from the centre of the street, be acceded to.—Agreed.

Holborn.—Buildings, to be used as warehouses, on the north side of Castle-street, Holborn, at less than the prescribed distance from the centres of Castle-street, Onslow-street, and Great Saffron Hill (Mr. E. J. May for Messrs. Falk, Stadelmann, & Co., Limited).—Consent.

Hackney, North.—A one-story addition to No. 21, Sanford-terrace, Stoke Newington Common, Hackney, less than the prescribed distance from the centre of Sanford-lane (Mr. G. Treacher for the Governor and Committee of the Incorporated Society of Licensed Victuallers).—Consent.

Poplar.—A cottage, a barge-building shed, and a saw-mill on the west side of Moisty-street, West Ferry-road, Millwall, at less than the prescribed distance from the centre of the street (Mr. G. H. Lovegrove for Messrs. Flower & Everett).—Consent.

Deptford.—That the Council do make no order with respect to the application of Mr. J. Webster for Mr. J. E. Pryor, for consent to the erection of a one-story stable on the east side of a passageway leading out of Ashby-road, Brockley-road, Deptford.—Agreed.

Chelsea.—Greenhouses and a potting-shed at the Physic-garden, Queen's-road West, Chelsea, at the corner of Swan-walk (Mr. E. G. Rivers for the Trustees of the Apothecaries' Company's Physic-garden).—Refused.

Woolwich.—A one-story building at Warren-lane Works, High-street, Woolwich, at less than the prescribed distance from the centre of the street (Messrs. Kirk & Randall).—Refused.

Space at Rear.

Lambeth North.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats on the site of Nos. 101 and 103, Lambeth-road, Lambeth, with an irregular open space at the rear (Mr. C. Ansell).—Consent.

Whitechapel.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of three houses, with shops, on the north side of Commercial-road, Whitechapel, at the corner of Church-lane, with irregular open spaces at the rear (Mr. H. O. Ellis for Mr. S. Kirstein).—Refused.

Deviations from Certified Plans.

Clapham.—Deviations from the plan certified by the District Surveyor, so far as relates to the proposed erection of an addition at the rear of No. 2, Currie-street, Nine-Elms, Lambeth, at the corner of Everett-street (Messrs. Hibbert Brothers, Limited, for Mrs. C. Despard).—Consent.

Hampstead.—Deviations from the plans certified by the District Surveyor, so far as relates to the proposed erection of a building on the site of Nos. 74, 76, and 78, High-road, Kilburn (Mr. T. Ballantine for Messrs. Parrs' Bank, Limited).—Consent.

St. George, Hanover-square.—That the application of Messrs. W. H. Romaine-Walker & Besant for the Duke of Marlborough for an extension of the periods within which the erection of a dwelling-house on the south side of Curzon-street, Mayfair, on the site of Curzon Chapel and No. 30, Market-street, was required to be commenced and completed, be granted.—Agreed.

Lines of Frontage, Projections, and Width of Way.

Hampstead.—The retention of a raised pavement over an area on the west side of Goldsmith-place, Kilburn, at the rear of No. 36, High-road, at less than the prescribed distance from the centre of Goldsmith-place (Mr. W. T. Farthing for Messrs. Roper & Co.).—Consent.

Brixton.—A block of residential flats on the site of Nos. 400 and 402, Coldharbour-lane, Brixton, at less than the prescribed distance from the centre of the street (Mr. F. A. Powell for Mr. A. G. H. Brown).—Consent.

Hackney, South.—A church and school building on the site of Nos. 122 and 124, Lauriston-road, Hackney, at the corner of Rutland-road, at less than

the prescribed distance from the centre of Rutland-road (Mr. P. M. Horder, for the trustees of the Trinity Congregational Church).—Consent.

Clapham.—Eleven houses with bay windows on the east side of Loats-road, and seven houses with bay windows on the west side of Lyham-road, Clapham (Messrs. Down Brothers for Mrs. R. S. Gray).—Consent.

Holborn.—Four one-story, and one three-story, oriel windows to an addition at the rear of No. 28, John-street, Bedford-row, Holborn, to be upon Little James-street (Mr. T. J. Anderson for Mr. T. H. Fankhurst).—Consent.

Woolwich.—That the application of Mr. J. O. Cook for Mr. C. Beasley, for an extension of the period within which the re-building of the Red Lion public-house on the north side of Shooter's-hill, Plumstead, was required to be commenced, be granted.—Agreed.

Width of Way and Construction of Building.

Poplar.—An open iron shed at the Regent Dry Dock, West Ferry-road, Millwall, without the site of such shed being covered with a layer of good concrete at least 6 in. thick, with the forecourt fence at less than the prescribed distance from the centre of Regent Dock-road (Mr. T. J. Anderson for the Gt. Gilling Iron Works Company, Limited).—Consent.

Lewisham.—A temporary wood, iron, and glass photographic studio on the forecourt of No. 84, Kirkdale, Sydenham, with the forecourt fence at less than the prescribed distance from the centre of Peak Hill (Mr. J. R. Vining for Mr. E. J. Pritchett).—Refused.

Width of Way and Height of Building.

Bow and Bromley.—A warehouse building on the west side of Fawe-street, Morris-road, Bromley-by-Bow (Mr. Max Clarke for Spratt's Patent, Limited).—Consent.

Formation of Streets.

Woolwich.—That the application of Mr. J. O. Cook for Mr. C. Beasley for an extension of the period within which the erection of five cottages next the Red Lion public-house, Shooter's Hill, Plumstead, was required to be commenced be granted.—Agreed.

Fulham.—Extension of time within which to complete the formation of a street to lead out of the northern side of Fulham-road, Fulham, and to be named Upham-road (Mr. A. Blackford).—Consent.

Fulham.—Retention of a wooden fence across the entrance to Vera-road, Fulham, near its junction with Colehill-lane (Mr. E. Messiter).—Consent.

Wandsworth.—That an order be issued to Messrs. Marler & Co., sanctioning the formation or laying out of a new street for carriage traffic on the Furzedown Park Estate, to lead out of the north side of Mitcham-lane, Streatham (Colonel R. J. Aspinall). That the name Welham-street be approved for the new street.—Agreed.

Kensington, South.—That an order be issued to Mr. E. J. Halsey refusing to sanction the formation or laying out of a street for carriage traffic on the east side of the south side of Sussex-place, Old Brompton-road, South Kensington.—Agreed.

Cubical Extent.

Kensington, South.—A building at rear of buildings on the south side of Sussex-place, Old Brompton-road, Kensington, to exceed in extent 250,000 but not 450,000 cubic ft., and to be used only for the purposes of a riding-school and repairing shop for motor-cars (Mr. E. J. Halsey for the Locomobile Company of America).—Refused.

Hackney, North.—A factory building with divisions to exceed in extent 250,000 cubic ft., and to be used only for the purposes of cabinet and joinery works, Tyssen-street, Dalston-lane, Hackney (Mr. E. O. Sachs for The Shannon, Limited).—Refused.

Dwelling-Houses on Low-Lying Land.

Woolwich.—Six buildings, to be used wholly or in part as dwelling-houses, on low-lying land situated on the north side of Bostal-lane, Abbey Wood, Plumstead (Mr. T. J. Young for Mr. W. Richardson).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BATHS, BECKENHAM.—The new public baths were opened at Beckenham on the 20th ult. The buildings, which, with a technical institute, have cost about 25,000*l.*, include a first-class, or covered, swimming bath, a second-class, or open-air, bath, slipper baths, and a laundry. The architect of the buildings was Mr. J. A. Angell, the Beckenham Council's Surveyor. The contractor was Mr. T. W. Jones, and the terra-cotta was supplied by Messrs. Gibbs & Canning. The mosaic and tiling work was carried out by Messrs. Minton & Co., the roofs were glazed with Messrs. Rendell's patent water-tight glazing, the hot-water heating work was executed by Messrs. Boaz & Sons, and the wrought-iron rails and gates were manufactured by Messrs. Hill & Smith. The electric light was installed by Messrs. Tamplin & Makovski. The clerk of works was Mr. A. J. Dorey.

Illustrations.

BRITANNIA ROYAL NAVAL COLLEGE,
DARTMOUTH:

THE SICK QUARTERS.

THESSE buildings are being erected by the Lords of the Admiralty on a sheltered site beyond the new college. The site falls rapidly towards the south, which keeps the wards well above the ground.

The wards are arranged in three blocks, one the general infirmary or non-infectious block with twenty-four beds, in which block also are the kitchens, stores, and servants' quarters for the whole building. The other two blocks are for infectious cases, and provide twenty beds each. Each large ward has a balcony towards the south, with a fine view towards the sea and the mouth of the Dart.

Consulting-room, dispensary, and dayroom for convalescents are provided in the block to the right, and separate dayrooms for infectious cases are provided in the infectious block, and also a small house for the doctor. At the west end is a small block for the accommodation of the infectious nurses.

The walls are faced with red bricks and Portland stone dressings, and the roofs covered with Delabole slates in graduated courses.

The buildings are warmed throughout by hot water, with combination stoves in the larger wards. The tower contains the tanks, which hold the water pumped up from the Sand Quay quarry.

The builders are Messrs. Higgs & Hill, and the clerks of works are Mr. S. E. Wallis and Mr. C. H. Hill. The architect is Mr. Aston Webb, A.R.A. The drawing is exhibited at the Royal Academy, the private view of which takes place to-day.

ST. MATTHEW, CHAPEL ALLERTON,
LEEDS.

THIS church has been recently built from the design of Mr. G. F. Bodley, A.R.A. The plan comprises nave and aisles and chancel, and a south chapel. The nave is long and is of six bays. There is a detached tower connected with the church by a cloister-like passage. The building is of strictly English character and is of the Decorated style. There is some excellent stained glass and the roofs are painted throughout.

The church is continuous, there being no chancel arch, and only a high and open screen dividing the nave from the chancel. On this screen the organ is placed after a manner usual in times past. This position is good acoustically, and the instrument does not obstruct the floor space. There is much to be said for this position of the organ, answering, as it does, for both nave and chancel. The work has been carried out by Messrs. Stephens & Baslow, of Bristol.

HAYE'S LODGE, NEAR DERBY.

THIS house has been built from the design of Mr. G. F. Bodley, A.R.A. It has an exterior of red stone, with deep bay windows having mullions and transoms, and some stained glass with armorial shields.

The character is that of an old English mansion, quiet but dignified. There is a garden, planned by the architect, in the style harmonious with old English domestic architecture. There is a good deal of oak panelling. The house has been built for Mrs. Sacheneral Bateman, on the site of a former building.

BOOKS RECEIVED.

FERGUSON'S SURVEYING CIRCLE AND PERCENTAGE TABLES. By John C. Fergusson. (Published by the author.)

ST. DAVID'S: THE CATHEDRAL AND SEE. By Philip A. Robson, A.R.I.B.A. (Geo. Bell & Sons.)

TRANSACTIONS OF THE MONUMENTAL BRASS SOCIETY. Vol. IV. Part 3.

NEW BUILDINGS, ABERGAVENNY Y.M.C.A.—The new buildings of the Abergavenny Y.M.C.A. were opened recently. The structure, which is situated in Frogmore-street, is erected from plans by Alderman Edwin Foster, Abergavenny. The accommodation includes a large assembly hall, reading-room, class and Bible-class rooms, ante-rooms, &c. The contract has been given to Mr. T. S. Foster, the price being 1,430l.

Books.

Works in Architecture of Robert and James Adam. Reprinted by Thézard fils. Books 2 and 3.

Mentioned in a former notice this republication of the great work of the Adams, which is being carried out by M. Thézard simultaneously in France and England, with a French and English text. The book is in fact as nearly as possible a facsimile of the original publication. It is being issued in parts, and we have now before us Parts 2 and 3.

Book 2 contains the elevations and details of Kenwood, one of the most elegant, in its formal way, of Adam's mansion designs, with its South front with carved pilasters contrasting with the plain rusticated basement story beneath them. A great many of the furniture designs are also given.

Book 3 contains the elevation of Luton Park (the plan is given in Book 2), a perspective showing Whitehall with the Admiralty, and the elevation of the Society of Arts house in John-street.

Considering the part which Robert Adam (for his brothers were but his shadows) played in the national architecture of his day, his great publication is to be regarded as a work of permanent value, and those who attach importance to their architectural library may feel glad that they have here an opportunity of securing what is essentially Adam's book, only on new paper, considering that copies of the original are hardly to be had now.

The Decorative Work of Robert and James Adam. London: B. T. Batsford. 1901.

THIS is a re-issue, with some alterations, of a folio volume of twenty-five plates of decorative subjects from Adam's works on architecture, which was issued by the present publisher a good many years ago, and is now out of print. One plate of the old selection has been withdrawn—the elevation of Sion House, and six new ones added, making a folio volume of thirty plates, the subjects of which are confined to furniture and decorative work, excluding architecture proper.

The fashion for the style of decorative work invented by the Adams has been so decidedly revived at present that there is no doubt that a republication like this will be welcomed by many; and even if we do not approve the school of ornament represented by it, one must admit that the work of the Adams in this class is remarkable for refinement and grace of treatment of the materials employed.

It should be remembered, however, that these materials are not those which go to form the highest class of ornament; they are mostly based on the imitation of artificial objects, and they show a vast amount of repetition of the same idea and the same details with only slight variations of arrangement. Such a style can never take rank as among the higher class of architectural decoration; it has no grandeur of line and no intellectual invention; and the time will come when this will be recognised, and the fashion for it will subside again. Meanwhile, Mr. Batsford's book will no doubt be useful, and will also have a permanent value for libraries, as a representation of this particular school of ornament.

The New Education: Manual Training; Woodwork. By RICHARD WAKE, Instructor to the Hull School Board. London: Chapman & Hall, Limited. 1899.

Art Crafts for Amateurs. By FRED MILLER. London: H. Virtue & Co., Limited. 1901.

IF it be possible to treat a practical subject too thoroughly, Mr. Wake may have laid himself open to that criticism. Both master and pupil are subjected by him to a system from which no loophole of escape presents itself. Yet it must be remembered that the teaching of benchwork in Board schools is in its infancy, and that the master has often to learn as well as the pupil. For it may be quite possible that the practical man has never before had to impart his knowledge, while, on the other hand, the trained teacher may find his subject a novel one. The method which is here proposed has been in operation, and has, upon the authority of the author, been found successful. Experience is the only possible test, and in this way Mr. Wake has the advantage of us. Yet we may say that the

system advocated, if it appears to err toward an excess of minutiae, grasps firmly the desirable principles, setting forth with clearness the kind of work that a particular tool is especially adapted for, and the best way of getting this especial kind of work out of it. The explanations are assisted by very good photographs of boys working at the bench, marking the positions necessary for the various tools and processes. We are quite sure that the introduction of some method would be found most desirable in many of the continuation classes, particularly those which are held in some of the outlying country schools, where we have noticed the want of it, and we shall take the opportunity better to inform ourselves upon the method in question by introducing it into a class of this description.

It would be difficult to find a book presenting more obvious contrasts to that just described than "Art Crafts for Amateurs."

The earnestness of the amateur would seem to exist in an inverse proportion to the opportunities at his command towards conquering his difficulties. He consequently possesses an inordinate craving for short cuts and sketchy treatment, forgetful that these are the privileges of the experienced. As Mr. Miller's book is ostensibly written for this class of worker, it would be pedantic in us to advocate the desirability of a knowledge of tools and materials, or a thorough acquaintance with old and approved examples before rushing into modern and original design. Yet a student would thus learn what forms are by their nature most suitable to the particular craft he professes, and further, what are the designs that have successfully withstood the criticism of ages. He would later on find his original faculties burst into bloom with a vigour that the pruning-knife can alone create. But he who engages in wood-carving or in copper-beating in the light of a healthy and blameless recreation will find many designs, both old and new, in Mr. Miller's book from which he may make selection, and a short and explicit introduction to the processes involved.

The Cottage Homes of England. By W. WALTER CROUCH. Second edition. London: P. S. King & Son.

"**T**HE Case against the Housing System in Rural Districts" is the supplementary title given by the author to his small book, which is an explanation, and at the same time an *exposé*, of the working of the Housing Acts of 1890 and 1900. So little time has elapsed since the passing of the amended Act, that criticism must be justified by inference rather than by experience.

These Acts, it may be remembered, have been passed with a view of enabling a Parish Council to provide the accommodation necessary for parish requirements by means of a loan sanctioned by the Local Government Board. But before these two bodies can be brought together there are obstacles to be surmounted which, in the author's opinion, are well-nigh insurmountable. The Rural Council has, in the first place, to be brought into line, and this in turn has to satisfy the County Council, which has again to satisfy the Local Government Board, a curriculum that has been known to extend over a space of five years.

The later Act has reduced the number of formalities, yet the bodies named still remain interested. Mr. Crouch thinks that the County Council might well have been kept out of the negotiations, unless called in as referee by a Parish Council in the event of the District Council proving intractable, for this latter is sometimes obstinately opposed to an increased rate.

These Acts, however, as the author admits, do not touch the question of cottage homes in the more actual sense—the cottage, that is, of the farm labourer. Neither sentiment nor obligation must be reckoned as a serious factor towards the preservation of these. A rental of one shilling a week allows no margin for repairs, and these cottages are in large numbers either falling into a condition that renders them scarcely habitable, or are disappearing altogether.

The Housing of the Working Classes Act. BY CHARLES E. ALLAN, Barrister, assisted by FRANCIS J. ALLAN, Medical Officer of Health to the City of Westminster. Second edition. London: Butterworth & Co. 1901.

This is a useful and clear work, not overloaded

with detail. The introduction gives a sketch of the legislation which has taken place during the last half century, and is then followed by the Acts duly annotated. Those who have to consult the statutes on this subject will find it a book brought up to date. We have the usual corollary, however, to make that the price, seven shillings and sixpence, is excessive. These legal handbooks, intended not only for lawyers but to many of the general public, should be published at a more reasonable price.

The Workmen's Compensation Act, 1897: a Plea for Revision. By R. T. THOMSON. London: E. Fingham Wilson, 1901.

So much has been written upon the many anomalies of the Workmen's Compensation Act that the publication of this work seems scarcely necessary. The first chapter appears to be a reprint of an article in the *Nineteenth Century* for June, 1898, since which date the House of Lords has given somewhat more coherence to the interpretation of this statute. The criticisms contained in this little book are sensible enough, but whether they were worth publishing, having regard to the fact that every newspaper in the country has been filled with similar comments, may, perhaps, be doubted.

Engineering Estimates and Cost Accounts. By FRANCIS G. BURTON, A.S.A.A. Manchester: The Technical Publishing Company.

IN these days of international competition in the engineering, as in other industries, to be up to date in method as well as in equipment has become a matter of stern necessity; and the author's experience is placed at our disposal with a view to rendering assistance in regard to the matters indicated by the title of his treatise. Points liable to be overlooked, but really requiring careful attention, are emphasised; traps and pitfalls into which the unwary and inexperienced estimator may fall are exposed; and many useful hints and valuable information given.

The difficulty of dealing with and anticipating fluctuations in wages is alluded to, and many, unfortunately, besides engineers will confirm the remark that "the modern practice of trade-unions is not guided so much by fixed principles or general considerations, as by the opportune advantages to be obtained from the exigencies of the employers." In a recent paper dealing with this subject, we were told of an employer being calmly informed by his men (on his pointing out to them that their action would inevitably drive away his trade) that they could follow trade if it went elsewhere. But even in this respect the workmen of the States are more advanced than in this country, as the recent prolonged struggle in the building trade at Chicago testifies.

Useful hints are given to those about to tender for Government work for the first time. "No mistake must be made in supposing the stringent requirements to be a mere bogey intended to frighten the builder into reasonably good behaviour; the clauses will, on the contrary, be strictly enforced, and nothing will be accepted unless it is of the very highest class in both material and workmanship." The foregoing refers particularly to shipbuilding, but every one who has any acquaintance with Government contracting knows that it is of very general application.

Mr. Burton ventures to give some advice, for which, seeing that he adopts a somewhat apologetic tone in tendering it, he evidently does not anticipate a ready acceptance. He considers that the managing staff often have to work too much in the dark after a certain point, especially in regard to such matters as the amount or percentage employed to provide for the item of "profit" in the preparation of estimates; and he pleads for "free and cordial co-operation between members of the staff on matters of cost and finance." In unwelcome contrast to this, and in questionable taste, is the cheap sneer in the preface at those "whose knowledge of business is limited to the making of artistic ticks and the checking of additions."

Spon's Architects' and Builders' Price Book, with Useful Memoranda and Tables. By W. YOUNG, architect. Twenty-eighth edition. Edited by CLYDE YOUNG, A.R.I.B.A. London: E. & F. N. Spon, Limited, 125, Strand, 1901.

This volume, although professing to be an "annual" one, is "annual" only in name, and

as far as its use as a price book is concerned, one edition is as good as another. Even the time-honoured preface, with its reference to "additional information," appears as usual, the only variations being in the date and the initials, the latter caused by the lamented death of its late editor.

The "editing," as far as we can gather, consists in the displacement of a few special manufactures and the substitution of others, but even these are very few. As a general work of reference it is very useful, but as a price-book its usefulness is nil, and we can only reiterate what we said respecting the immediately preceding edition: that the book should either be thoroughly revised—in fact, in a great part rewritten and rearranged—or, on the other hand, the price-book omitted entirely, thereby reducing the bulk about one-half and issuing it boldly as a general handbook with the "useful memoranda and tables" as the chief feature.

A Handbook of Practical Gasfitting for the use of Students, Plumbers, Gasfitters, and Gas Managers. With 143 illustrations. By WALTER GRAFTON, F.C.S. London: Published by B. T. Batsford, 1901.

This book contains much useful information relating to gasfitting and gas appliances. It is divided into twenty-three chapters, and concludes with a satisfactory index. The first chapter is devoted to "regulations affecting gasfitting" and the third to "the law affecting gas supply." Other chapters deal with meter fixing, gas fires and burners, incandescent gas lighting, and the materials and tools used in gasfitting. The final chapter discusses the lighting of railway carriages and signals.

The author is a recognised authority upon the subject of gas lighting, and gasfitters and others who intend to study gasfitting in practical detail will find the book most serviceable. We fully agree with the author in his statement that "there is plenty of improvement needed on the part of many employed in running services and erecting fittings," and that "intelligent ideas on proportioning services, and on the principles of combustion and burners, will tend to the employment of fittings and burners giving higher units of efficiency." The author might in many instances improve the wording of his sentences, although it is not difficult to grasp their meaning.

In the chapter on "gas supply for dwelling-houses" we read that "many landlords will not pay for iron piping, principally because of damaging the walls, consequently the work has to be done with composition pipe, which is far inferior and cheaper. This is used entirely from outlet of meter, but no soft piping should be fixed in plaster, where it may eventually get damaged by nails. In Scotland this method is much practised. Iron piping is the best material to use, and in the end gives the greatest satisfaction." The author then proceeds to describe in detail how to fit a house with composition pipe.

Many of the illustrations are already familiar to our readers, as they are merely reproductions of figures to be found in various trade catalogues; and a few of them, such as those on pages 211 and 306, are reduced to so small a scale as to appear ridiculous. Considered as a whole, the book is a welcome addition to the existing literature on the subject, and as a work of reference will be found useful in the office of every architect and builder.

"Who's Who?" 1901. London: Adam & Charles Black.

LOOKING at this annual publication from our own point of view, we find, as we suppose members of other professions or pursuits will find, a curious irregularity in regard to the degree of celebrity which entitles a man to notice, which seems to argue that the length and importance of a notice, or its existence in this book at all, must be a good deal influenced by the personal ambitions of the people who desire to be noticed. So obscure indeed are some of the names included, that it may be doubted whether they could be said to be known at all until they got between the covers of the publication in question. This perhaps is one gate of Fame—send your biography to the publishers of "Who's Who?"

Looking through the architects, we find among the architects whose names are not mentioned Mr. Brydon, the architect of the new Government Offices; Mr. Emerson, the

President of the Institute of Architects; Mr. Carøe; the late Mr. Young, the architect of the new War Office, who was still living when this volume must have been in process of compilation; Mr. Philip Webb; Mr. Lethaby; Mr. Ricardo, &c. Mr. Belcher's name and address are given, but no further information. On the other hand, we find people of much less importance noticed at some length. The publishers or editor ought to endeavour to find out who are the really eminent persons in a profession, and deal with them accordingly, so as to observe a due proportion in their notices.

TRADE CATALOGUES.

THE Acetylene Corporation of Great Britain Limited, send us a price-list of "Auto-Simplex" generators and other apparatus for acetylene gas lighting. If 20 c.p. burners are employed, the cost of an installation to feed 100 burners for six hours is quoted at 85l.; for 200 lights for six hours at 150l.; and for 500 lights for six hours at 330l. The price of carbide purchased in quantities of not less than 1 cwt. is quoted at from 24d. to 27d. per lb., according to the distance from the storage depot. The corporation supplies all the common accessories for the use of acetylene, and also portable lamps. We are glad to observe that these portable lamps are not recommended, for although we are acquainted with most of the acetylene table lamps on the market at the present time, we have never met with one suitable for daily use in a dwelling-house. When the lamps are recharged the odour of the gas penetrates the entire building, and most of the lamps have other objectionable features.

Correspondence.

To the Editor of THE BUILDER.

THE R.I.B.A. COUNCIL.

SIR.—It is somewhat remarkable to note what an unrepresentative list of Associate Members nominated for the Council of the R.I.B.A. is presented to the general body of the Institute, from which to select four names. In my humble opinion, only the first name should receive support, the remaining six having been in the class of Associates for the past eleven to thirteen years, paying the minimum subscription and receiving practically the maximum advantage. Of the six names I refer to, five are old and much-valued friends of mine, who, without exception, to be in the class of Fellows, and upon the Council as such.

This anomaly is absolutely reprehensible; three of these gentlemen are in the forefront of the profession, their names are household words, their works are well known and appreciated, and their practices large. I am sorry that they should exhibit such a lack of loyalty to the body politic they profess to adorn and assist.

Their position is but a sample, as there are hundreds of others in the general body, who assume a similar attitude; the financial condition of the Institute, and its progress would be much facilitated by a little thoughtful loyalty on the part of these "aged" Associates.

It seems to me that the new Council should take means to make this state of things impossible in the future, and that means should be devised by which it is obligatory upon Associates to proceed to full membership, and so contribute to the wellbeing of our representative body. I respectfully commend this to the notice of the Council and to the attention of the general body in particular.

A CANDID CRITIC.

THE MANCHESTER FIRE STATION COMPETITION.

SIR.—I have not seen the amended instructions issued by the Manchester Corporation for the intended competition for the new fire station, but, as far as I can gather from the professional papers, the essential objection to the competition remains unaltered—viz., the condition that the architect whose design is awarded the first premium may not be appointed architect for the building, the Corporation reserving to themselves full power to appoint any architect.

It is probably only locally known that an architectural department is to be formed at the Manchester Town Hall, with a prominent architect as chief. It is quite possible, therefore, for the Corporation to pay the premiums, and take the brainwork of competitors, and hand over the working-out to the new department.

Should that occur, the amendment of the 3 per cent. commission first offered to 5 per cent. would be a very nominal improvement.

The whole thing as it at present stands is very speculative; every competitor has to face the possibility that, should he succeed in taking the first premium, he may be appointed architect for the carrying out of his design, or he may be politely told that his services are not required, as the new department will carry it out.
To deliberately face eight or ten weeks' work and considerable expense with such alternatives is not very attractive. ARCHITECT.

THE DESIGN OF THE PIANOFORTE.

SIR,—In the notice in your issue of March 23 of the visit paid by the Architectural Association of London to Broadwood's Exhibition doubt is expressed of the desirability of any departure from the usual shape of the horizontal pianoforte. The remark that the square shape appears to necessitate "padding" is very natural, seeing that the wing form is universally adopted; but I shall be glad if you will permit me to say that the conclusion is not justified by a closer inquiry.

The shape of the harpsichord is the natural result of the disposition of the strings. The long bass strings run at right angles to the keyboard, and the other strings are parallel to them, and the graduated sounding lengths give a sweep to the bridge which is closely followed by the outline of the case. The vibrations of the strings are feeble, and can set in effective motion but a very limited extent of very thin sounding-board.

The grand pianoforte followed the lines of the harpsichord, and the wing shape was, therefore, its natural form. The more powerful vibrations of the strings, however, permitted the use of a larger sounding-board and the elegant lines of the harpsichord were lost. When, later, the strings were crossed (or overstrung), the bass bridge took a more advantageous position upon the sounding-board, which was broadened out at the tail end to the shape which is now familiar. The pianoforte referred to in your notice of the visit is the result of an attempt to utilise the still greater sound-board afforded by a yet further expansion to the rectangular shape, which, for decorative purposes, Mr. Ashbee preferred.

There is no "padding" about this instrument. By the disposition of the strings, the increased dimensions are utilised with very marked gain in power, due to the larger sounding-board, which also, by reason of its greater sensitiveness, produces piano effects of peculiar freedom and beauty. As an experiment the instrument is a success, and in Mr. Ashbee's hands it will become a thing of beauty to the eye. Some persons will, no doubt, object to the shape of such a pianoforte, and to them I would reply that, though an excellent pianoforte can be made upon the usual lines, the square shape produces a still better musical instrument.

GEORGE ROSE.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

17.—TROUGH-CLOSETS, LATRINES, AND WASTE-WATER CLOSETS.

TROUGH-CLOSETS.—Trough-closets are a simple kind of water-closet, and have been extensively used in connection with factories, barracks, schools, and other buildings, where accommodation is required for a large number of persons, and where simplicity of construction, strength, and automatic action are desired. They consist of a trough—generally of salt-glazed fireclay—with a weir at one end, so that a certain amount of water is always retained in the trough for the reception of the soil, and with a flush-pipe at the other end fed from a cistern usually automatic in action. Longitudinal and transverse sections of a simple type are given in fig. 1; the top of the trough is open from end to end, the seat being simply a continuous wood rail bolted to the edge of the trough. A course of splayed bricks is shown along the back to prevent liquid or solid matter falling into the space behind the trough. As dirt from the floor of the closet is certain to be blown or swept into this space, it is a good plan to fill it with fine cement concrete; the trough has been tested; the angle above the top of the trough can then be finished with glazed bricks or with a triangular fillet of cement. The water from the flush-pipe is in this example discharged through a bent inlet nozzle opening near the bottom of the trough—an arrangement which reduces the splashing and ensures a better flush.

The troughs are generally made in lengths of about 2 ft., but in order to reduce the number of joints special troughs can be obtained up to 3 ft. 0 in. long. The troughs must be set perfectly level; if the outlet end is too high

the soil will be difficult to flush out, and if it is too low, the depth of the standing water will be reduced towards the inlet end. The joints ought to be made with neat cement, and the troughs tested by filling them with water after plunging the outlet.

The points to be observed in the design of troughs are (1) that the sides of the trough above the water level are so designed that they cannot easily be fouled, (2) that the depth of the standing water is sufficient to cover the soil, while at the same time the quantity of water is not unduly increased, and (3) that the shape of the trough is such that the contents are easily flushed out. Various sections are given in fig. 2, E being peculiar in having a perforated flushing rim along both sides.

Trough-closets are also made with a siphonic discharge. Duckett's apparatus is shown in fig. 3. The trough is of improved shape, and has a channel bolted along the back edge to serve as a flushing rim and as a conduit for the water. The inlet A is 3 in. in diameter, and is supplied from an automatic siphon flush-tank. An air-pipe B is carried up from the top of the bend between the two outlet-traps, and is so connected to the flush-tank that siphonage in the trap C is stopped before all the contents of the tank have been discharged; the last portion of the flush is therefore available for recharging the trough. The whole of the flush-water passes through the troughs, and the outlet-traps can, of course, be turned in any direction.

Instead of the continuous open top, trough-closets are often made with the top of each section partially covered, so that wood seats of ordinary form can be attached. In other cases the trough is replaced by a round or oval tube, with a junction at the top for the reception of the seat, as shown in fig. 4. The vertical portion ought to be specially designed to prevent fouling. The space behind such closets cannot possibly be kept clean, and ought therefore to be filled with fine concrete. Fig. 5 shows another modification, in which the only standing water is in the dish-shaped junction piece under each basin. It cannot be recommended.

Trough-closets require a large volume of water. A discharge of fifty gallons is sometimes allowed for ranges up to 12 ft. in length, seventy gallons for ranges from 13 ft. to 17 ft. long, and 100 gallons for ranges from 18 ft. to 22 ft. long. These quantities give a minimum flush of about ten gallons per seat, but smaller quantities down to six or even four gallons per seat are often allowed, although of course the result is less satisfactory. The discharge of these large volumes of water causes a considerable amount of splashing, which is often very annoying. The flush-tank may be regulated to discharge automatically at stated intervals. No hard-and-fast rule can be laid down as to the number of flushes required daily, as so much depends upon the amount of usage which the closets receive; but it is always best to err on the side of cleanliness. Sometimes a "controlling vessel" is fitted to the trough and so arranged as to receive the overflow of water caused by the deposits. The filling of this vessel brings on a supply of water to the flush tank (which has already been partially filled through a pipe controlled by a ball-tap), and starts the siphonic action. The frequency of the discharge is thus automatically regulated by the usage of the closets. An objection to such an apparatus is that the closets may remain unflushed for long periods, although containing a considerable amount of objectionable matter.

Latrines.—Trough-closets are far from satisfactory. The standing water is as a rule too shallow to cover a number of deposits, and emanations from one part pass through the whole range, thus increasing the risk of infection. It is much better to have a range of separate basins trapped from each other by the standing water. The name "latrines" may with advantage be confined to closets of this kind in order to distinguish them from trough-closets. They are discharged by siphonic action, which is started by the discharge from a flushing-tank, generally automatic, but sometimes operated by a pull. Fig. 6 shows the longitudinal and transverse sections of a range of latrines of this kind. The basins are usually fixed 2 ft., 2 ft. 3 in., or 2 ft. 6 in. from centre to centre, but longer connecting pipes can be obtained if required. The flush-pipe A for ranges of not more than six closets is 2½ in. in diameter with 1½-inch branch to each basin. The basins are provided with flushing rims, and contain a considerable

quantity of water, which is held up by the weir of the siphon at B. Below the long leg of the siphon a trap C is fixed, of P or S shape, fitted with a nozzle for an anti-siphonage D. The connecting pipes E and the siphon and trap are 4 in. in diameter. From the top of the siphon bend a ¾ in. air-pipe F is carried up and either bent down into the cistern or connected with the flush-pipe, in such a manner that the siphonic discharge of the closets will cease at a certain point in the discharge of the flush-tank; the last portion of the flush is thus utilised for recharging the closets. It is difficult to regulate this exactly, and the standing water is often considerably below the level of the weir at B. To obviate this, a small vessel with a separate supply-pipe controlled by a ball-valve may be advantageously fixed on the floor at one end of the range, and connected to the junction-pipe under the first basin. The ball-valve is arranged to shut off the supply when the water standing in the range approximates to the level of the weir at B. With high-pressure supplies secret waste may easily occur, and many water companies consequently object to the arrangement except in the case of buildings supplied by meter.

The connecting-pipes in fig. 6 are above the floor, which is a convenient position when the range is in an upper story, but the space behind the pipes cannot possibly be kept clean, and ought therefore to be filled with concrete. The stopper G facilitates access to the connecting-pipes. In many cases longer hoppers are used and the connecting-pipes are laid below the floor. It is obvious that when (as in fig. 6) the hoppers are fixed on the top of the pipes the contents of the first hopper are drawn under each successive hopper, and perfect isolation is not obtained. A more recent form of latrine has the pipes behind the hoppers, each hopper having an oblong outlet at the back fitting into a corresponding socket in the side of the pipe. This ensures an almost perfect isolation.

As a rule, not more than six closets are fixed in one range, but occasionally as many as ten closets have been flushed from one tank. Where more than six closets are used, the tank must be at or near the middle of the range. For such ranges the tanks are of large size, and care must be taken in designing the building to allow sufficient height at the points where the tanks must be fixed. The height from the floor to the bottom of the tank is generally about 6 ft., but some makers recommend 8 ft. or even more, to which must be added the depth of the tank and sufficient space above for removing the parts of the siphon in case repairs are required; the dome of an annular siphon is very nearly equal to the depth of the cistern, and space must be allowed for removing this. The following dimensions of the "Tubal" closet-range may prove useful:—

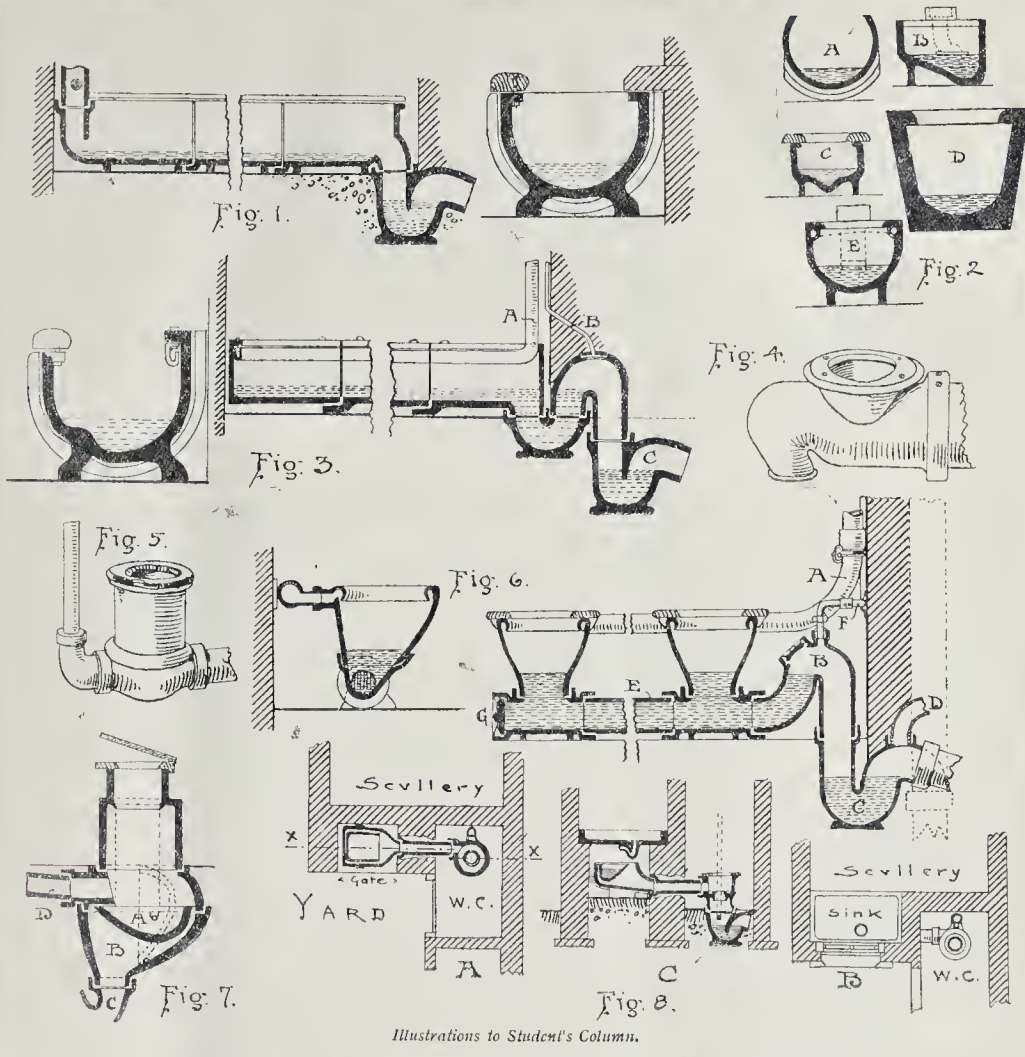
Number of basins	3	4	5	6	7	9	10
Connecting-pipes	in. 10.	in. 10.	in. 10.	in. 10.	in. 10.	in. 10.	in. 10.
Trap	5½	5½	5½	5½	8	8	8
Flush-pipe, Vertical	3	3	3	3	3½	3½	3½
" Horizontal	3	3	3	3	3	3	3
Tank Length	20	28	30	30	30	44	47
" Breadth	17	17	17	18	20	20	20
" Depth	24	30	30	30	30	30	30

The hoppers are usually of salt-glazed or enamelled fire-clay, and the connecting-pipes and traps of similar material or of glass-enamelled cast iron.

Latrines are often fixed in well-ventilated outbuildings with thin walls, and are thus practically unprotected from frost. The result has been that in many cases the basins and connecting-pipes have been cracked in severe weather. It is, therefore, advisable to use fittings made of strong fireclay of considerable thickness, and also to adopt some arrangement whereby the water can be drawn from the range, the outlet-trap being, of course, left charged to prevent the passage of sewer air into the buildings. In Duckett's siphonic latrines a cock is fixed in the air pipe connecting the siphon and tank; when this cock is closed and the flush tank discharged, practically the whole of the water is siphoned out of the latrines.

Wash-down closets are often fixed in ranges to form latrines, and flushed by a single tank. The outlets of the closet-traps may be flanged and bolted to a cast-iron pipe above the floor, or may be connected by short branch pipes to a pipe laid below the floor. The flush-tank should be large enough to give a flush of five or six gallons to each basin at each discharge.

Flush-tanks.—Flush-tanks for trough-closets and latrines are almost invariably of the



Illustrations to Student's Column.

siphonic type, and ought to be designed so that the action will be started by a drop-by-drop supply. In some cases the tank is filled by repeated discharges of a tipper, and when the tank is filled to the top of the siphon-pipe another discharge of the tipper starts the siphonic action; an additional supply-pipe controlled by a tap can be used to fill the tank more rapidly if required. Sometimes large tippers are used instead of siphon-tanks. These discharge the water with great velocity, and may be used for ordinary trough-closets, but do not give the after-flush required for recharging siphonic latrines.

Waste-water Closets.—Many water companies make an extra charge for ordinary water-closets, and as this charge was felt to be somewhat burdensome to the occupiers of small cottages, closets were designed for flushing with the waste water from sinks. The early closets of this kind were all objectionable on account of the great length of the tube (in some cases 4 ft. 6 in.) from the seat to the trap; this tube was soon fouled, and the closets became almost as evil-smelling as the rail-closets they were intended to supersede. Improvements of various kinds have, however, been effected in order to prevent or diminish this fouling, such as fixing the tube in a slightly-inclined position instead of exactly vertical, or making the lower portion of the tube of larger area than the pedestal, so that fouling would be confined to the latter, which, being nearer the seat, could be more easily cleaned from the top.

The essential part of all waste-water closets is the tipper for the reception of the waste water from the sink or yard gully. This tipper is swung on pivots, and is so designed that, when filled with water, it overbalances and discharges the water with considerable velocity, and, when empty, returns to its horizontal position. It is usually made of glazed fireclay, with a capacity of three gallons, rubber buffers being provided to prevent jarring and fracture. In some closets, as, for example, Day's "Stafford" closet (fig. 7), the tipper is placed directly below the seat, so that it receives the soil as well as the waste water. The tipper A is swung in the container B, which has a 6-in. outlet at the bottom, and fits into a trap C tapering from 6 in. to 4 in. The waste-water inlet is shown at D. Lengthening pipes are made for fixing between the top of the container and the pedestal in those places where the invert of the inlet is more than about 11 in. below the floor of the closet.

In courts and other places where two closets must be flushed from a single gully the first closet may be as in fig. 7, with the exception that a diminishing bend takes the place of the trap C. From this bend 4-in. drain-pipes are laid to the base-piece of the second closet, and the trap is fixed under this base. Plain tubes are carried up from the base to the pedestal. The water discharged by the tipper in the first closet passes, therefore, through the base of the second closet.

J. Duckett & Son's "Perfect" waste-water closet is a great improvement on the older

types. The long tube between the trap and the pedestal is abolished by raising the tipper to a higher level. The general arrangement is shown to a small scale in fig. 8, A being the plan below the sink, B the plan above the sink, and C the section on the line XX. The pedestal has an annular channel containing water, and the inlet from the tipper-container is connected so as to give a whirlpool motion around the channel, thus effectually cleansing it. The small chamber containing the tipper is open to the yard on one side; a light wrought-iron gate is hung in the opening to protect the tipper from injury, while at the same time affording ready means of access. The brick-work around the chamber ought to be laid in good cement mortar and well grouted, and the sink to be well bedded in similar material, in order to prevent foul air passing through to the scullery. A ventilation-pipe is carried up from the trap of the closet. In a still more recent closet introduced by the same firm the basin is practically an ordinary wash-down basin with trap, but with a side inlet for the waste water instead of the usual flushing-rim.

Experiments in several towns have shown that houses provided with waste-water closets require less water than those provided with ordinary water-closets, and this is an advantage not to be overlooked when the water supply is limited. The sewage is also slightly less diluted, and this results in economy at the outfall works. Waste-water closets are also less liable to injury by frost, as the water used in flushing is warmer and as the trap is fixed

below the surface of the ground. The Sanitary Inspector of Burnley reported in 1895 that during the year ending March 25 65 per cent. of the waste-water closets had been "noted as being out of order, and 37 4 per cent. of clean-water closets . . . mainly on account of the frost."

The great disadvantage of many waste-water closets is that the sides of the tubes are quickly fouled, with the result that the closets are more odorous than pleasant. The writer has used several different kinds in various blocks of cottages, but, while admitting that they are very much better than pail-closets, he cannot regard them as equal to a good wash-down closet.

OBITUARY.

MR. W. BASSETT-SMITH.—In addition to the particulars given in our "Obituary" column of last week, we may add that Mr. Bassett-Smith's work as a church architect was not confined to this country. He built several churches in Australia and the West Indies, his most prominent work in the colonies having been the remodelling of Trinidad Cathedral, the choir of which has been completed.

GENERAL BUILDING NEWS.

RESTORATION OF LITTLE BOWDEN CHURCH, MARKET HARBOROUGH.—It is proposed to restore Little Bowden Parish Church at a cost of about 2,200l. Mr. G. F. Bodley, A.R.A., of London, is the architect engaged, and the contractor is Mr. Halliday, of Stamford.

CHURCH, ST. MARTIN, UPPER KNOWLE, BRISTOL.—The new Church of St. Martin, Upper Knowle, the foundation-stone of which was laid in June last, has just been consecrated. The scheme provided for a building to accommodate 700 worshippers, but the work completed is limited to the chancel, vestries, &c., and two bays of the nave. The style is Early English, and the building is of pennant stone with Bath stone dressings. The portion completed will cost about 3,000l. Mr. W. V. Gough is the architect, and Mr. M. Durnford the contractor.

BAPTIST CHURCH, PRESTWICK, Ayrshire.—A new Baptist church has just been opened at New Prestwick. The church is 58 ft. 3 in. by 29 ft. 6 in. The accommodation will be for about 250; there are three exits, two to the front, and one at the back of the building entering by the side of the pulpit, which is of the platform type, with stair on either side. In front of the pulpit is the choir platform, underneath which is constructed the baptistry. Immediately behind the pulpit are a classroom, a vestry, lavatory, and heating-chamber. The church is heated with low-pressure hot water, and there is an electric light installation throughout the building. The cost of the building will be about 1,200l. The architect was Mr. William Kerr, and the contractors were:—Mason work, Mr. A. Hunter, builder; joiner work, Messrs. McLauchlan & Son; plumber and slater work, Mr. A. Dalrymple; plaster work, Messrs. D. & T. Bone; painter work, Messrs. J. E. Bennett & Sons; electric lighting, Messrs. Reid & Co.; and upholstery, Mr. Lauchlan Morrison.

RESTORATION OF THE PARISH CHURCH, MACCLESFIELD.—The parish church of Macclesfield, which has been restored at a cost of 21,000l., was reopened on the 24th ult. The old church was first built in 1278. It was rebuilt in 1710, but about fifteen years ago it had become so dilapidated that the people of Macclesfield determined to restore the building. The late Sir Arthur Blomfield prepared plans for the restoration. The chancel was first dealt with, and then the work stopped for a time for lack of funds. In 1898 there was a revival of interest in the project, and a movement was begun which has ended in the complete restoration of the church. The nave and tower have been entirely rebuilt. The Savage and Legh Chapels have been restored, but the ancient monuments are untouched.

KELVIN GROVE SCHOOL, GATESHEAD.—The Gateshead School Board are about to commence Kelvin Grove School from the design of Mr. J. Landell Nicholson, architect, Newcastle-on-Tyne, which design was placed first in competition last year, and which has been delayed through the bricklayers' strike settled recently. This, the first block of the two in the complete scheme, gives accommodation for 400 infants on the ground floor and 300 junior boys and girls on the first floor, at a cost of about 7,000l.

CONGREGATIONAL LECTURE HALL, WOKING.—Last October memorial stones were laid at Woking of a Congregational lecture hall, with infants schoolroom, church kitchen, and necessary offices. The building has just been opened in York-road. Designed by Mr. W. Howard Seth-Smith, and built by Messrs. J. Harris & Son, the lecture hall, which will be used as a temporary church, accommodates 250 people, and is constructed of red brick, with tiled roof, and external woodwork of teak. Provision is made for the addition of classrooms when the necessity arises. The building is electrically lighted, and is heated by hot-water pipes, ventila-

tion being secured by a silent electric exhaust fan in the roof.

PUBLIC HALL, MANSFIELD, NOTTINGHAMSHIRE.—A new hall, the Victoria Hall, has been erected at Mansfield. It occupies a position at the top of Leeming-street, on the site of the old courthouse and the old-established inn known as the Bowl-in-Hand. The building is of red brick, relieved by stone dressings. The chief hall measures 78 ft. by 39 ft. and 28 ft. high, providing accommodation, with balcony, for upwards of 800 people. It is lighted by six semi-circular windows on the north side, and a seventh in the gable and overlooking Leeming-street. A stage, fitted with appliances for theatrical performances and provision for an orchestra, occupies one end of the room, whilst four dressing-rooms or retiring-rooms are placed at the rear. Under the hall is a supper or dining room, which will also be used for smoking concerts, meetings, &c. The architects are Messrs. Vallance & Westwick, of Mansfield; the builders Messrs. J. Hutchinson & Sons, Nottingham; whilst the decorating has been done by Mr. C. E. Greenwood, Mansfield.

SUNDAY SCHOOLS, GRANTHAM.—The foundation-stones were laid on the 18th ult. of new Sunday schools in connexion with the Wesley Chapel, Spittlegate, Grantham. The building adjoins the chapel, and, with a caretaker's house, involves an outlay of 2,330l. The main room will be 59 ft. 6 in. by 39 ft. 6 in., with seating accommodation for some 400 children. In addition there will be six classrooms, each 11 ft. by 10 ft., and at the rear a kitchen and the usual out offices. The heating will be by water. The contractor is Mr. Corah, of Loughborough, the stonemason Mr. G. H. Linnell, Grantham, and the plans were prepared by Mr. G. Camplin, of Grantham.

CONVALESCENT HOME, SHEFFIELD.—The Woodfin Convalescent Home, Whiteley Wood, Sheffield, is now complete. Messrs. Hemmell & Paterson were the architects. Mr. Woodfin's estate, which amounted to over 13,000l., was, after certain private bequests, left for charitable purposes. Two-thirds of his residuary estate were to be devoted to providing a convalescent home and one-third for almshouses. The latter, in Ecclesall-road, are already occupied, and in a few weeks the home will be ready for patients. Accommodation has been provided for about forty. Additional room has also been provided for patients who might care to avail themselves of the benefits of the institution and are able to contribute towards the cost of their support. Between twenty and thirty convalescents can be admitted under the latter scheme. The institution, which has a southern aspect, stands in 10½ acres of land. The building is two stories high. On the ground floor is the dining-hall, which, together with the principal entrance-hall, occupies the centre of the front. To the east and west of the central portion are respectively the women's and men's wings. The women's wing contains reading and writing rooms, and a parlour lighted by a large bay window, as well as the office and the matron's sitting-room. On the men's side there is also a reading and writing room, and a billiard and smoking room. On the first floor are the bedrooms, those for men being, as in the case of the day-rooms, in the west wing, and for women in the east. In these the cubicle system has been adopted, the space being divided by means of wood partitions into rooms for two or three beds. The windows of the cubicles on the south front are treated as French casements. The central portion over the dining and entrance-hall is divided into two parts—that to the front being sub-divided into cubicles, and so planned that it can be used as an alternative ward for either wing, so as to provide for the fluctuation of the relative number of patients of each sex; that to the back being sub-divided into cubicles, baths, &c., for servants. At the end of each wing there is an emergency door and an outside escape staircase in case of fire. The building is lighted by electricity.

WESLEYAN CHURCH, PLATT BRIDGE, WIGAN.—A new Wesleyan church is being erected at Platt Bridge from the designs of Mr. J. Wills, architect, of Derby.

BUSINESS PREMISES, BRISTOL.—New premises have been erected in Wine-street and Union-street, Bristol, for Mr. J. Chambers. The artificial light throughout the buildings is electricity (installed by Messrs. Buchanan & Curwen, under the supervision of Herbert Thomas Sully, A.I.E.E., electrical engineer). The contractor for the building was Mr. R. F. Ridd. The carving was executed by Mr. W. Smith, of Montpellier. Messrs. Foster & Wood were the architects of the building.

SANITARY AND ENGINEERING NEWS.

LIVERPOOL WATER WORKS.—At a recent meeting of the Liverpool City Council, Alderman Burgess (chairman of the Water Committee) moved that the salary of Mr. Joseph Parry, the water engineer, be advanced from 1,200l. to 1,400l. In reply to Alderman Salvidge, who asked for the reasons, he added that Mr. Parry had been in the service of the Corporation for nearly forty years. The water revenue had increased by 34,702l. since 1895, while the expenses had been decreased by 1,511l. The population supplied with water outside the city alone was 330,000, the revenue for that area, which

was nearly increasing, being about 12,000l. per annum. Then there were some important new works in course of construction, including at Prescott the largest service-reservoir of the Corporation, while a second pipeline from Wyrwy and a water supply to Wallasey were in contemplation. The recommendation was adopted.

LIANDUDNO WATER AND GAS SUPPLIES.—An inquiry on behalf of the Local Government Board was held on the 24th ult. at the office of the Urban District Council, Llandudno, by Mr. A. G. Malet, Inspector of the Board, with reference to applications for leave to borrow 4,700l. for gasworks purposes, and 16,301l. for works of water supply. Mr. E. P. Stephenson, engineer, stated that Llandudno derived its water supply from Duly Lake, some eight miles from the town, and from the lake to Llandudno there was a main line 9 in. in diameter. It was found that this did not give a sufficient flow, and an additional main, 15 in. in diameter, was laid from Caerhun, at the foot of the hills in which the lake is situated, to Crean Hill. The application now was for money to extend this main to Llandudno, a distance of 3½ miles. The 15-in. had also been laid along Mostyn-street. The estimated outlay of 16,301l. included that already incurred on the Mostyn-street extension. There was no opposition

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Sanitary Tint Company have removed to new premises in Rivers-road, Liverpool.—Mr. E. Kilburn Scott, A.M. Inst. C.E., has taken the post of engineer and manager, for the United Kingdom, Colonies, and Egypt, to the International Electric Company of Liege; the London offices being at Clun House, Surrey-street, Strand.

ARBITRATION CASE.—At the Surveyors' Institution, Westminster, on the 23rd ult., Mr. Daniel Watney sat as sole arbitrator to assess the compensation to be paid to the Rev. Septimus Streeton for a small portion of land in Gipsy-lane, which the London School Board had taken for the extension of their school there. From the opening statement of counsel it appeared that in May, 1883, the claimant succeeded to a moiety of a piece of land in Gipsy-lane, with a frontage of 16 ft. and a depth of 235 ft., which was copyhold of the manor of Lambeth. According to the custom of the manor, any copyhold land sold to a purchaser who is not a tenant of the manor is subject to a fine to the lord of the manor equal to twice the annual value of the land, whilst a copyholder escapes the fine. The claimant took advantage of this, and sold small and undivided shares of his copyhold to enable the purchasers of any copyhold land to become copyholders of the manor and so escape the fines leviable on their purchases. In this way claimant sold one-third of his moiety in July, 1885, for 25l.; another third in October, 1885, for 50l.; and then he sub-divided the remaining third into three portions, one of which he sold in 1884 for 50l. and another in 1880 for 75l. The other portion, one-eighth of the whole plot, claimant still held when the School Board served him with notice in 1894; and he claimed for 150l., which he estimated he could have secured by selling it in the way he had disposed of the remainder of his moiety. Mr. F. Parish, solicitor, and Mr. W. E. Parish, surveyor, proved the facts as stated by the learned counsel. The latter valued the land at 9l. on a basis of 10l. per foot frontage, but he considered 150l. could have been secured by dividing it. On the part of the School Board Mr. Howard Martin, surveyor, estimated the value of the whole land, at 6l. per foot frontage, at 96l., the claimant's share being 4l. 5s. In his opinion 5l. would be a liberal compensation. Mr. G. A. Wilkinson, surveyor, corroborated this view. Counsel having addressed the arbitrator, Mr. Watney reserved his award.

DEMOLITION OF HISTORIC HOUSES AT WINDSOR.—The Corporation of Windsor have begun the demolition of seven historic houses which were good examples of the architecture of the reign of Charles I. The houses adjoin the present vicarage of Windsor, which formerly was a residence attached to Windsor Castle. They also adjoin a large piece of waste Crown land which was offered to the Corporation some time ago. Upon this and the site rendered vacant by the demolition of the houses, it was proposed to erect a volunteer drill hall, as a memorial to the late Prince Christian Victor, but the project fell through owing to lack of support. The Corporation having condemned the houses—their own property—as unfit for human habitation, their destruction is being proceeded with.

THE HOUSING QUESTION IN BIRMINGHAM.—The Housing Committee held another meeting on the 22nd ult., under the presidency of Alderman Cook, but though they had four schemes for a block of flats in Potter-street before them, they came to no definite decision. However, the members of the committee present favoured one of the schemes presented, and this scheme, amended in accordance with certain alterations which were made, will be again brought up at a special meeting of the committee, when it is expected that it will be approved for recommendation to the Council. This scheme provides for a four-story block containing between sixty and seventy tenements. At the meeting of the

committee a deputation from the Birmingham Architectural Association was introduced on the question of throwing open to general competition the designs and plans for the dwellings which the committee propose erecting. It was, however, pointed out by the chairman that with regard to the Potter-street and Bordesley Green schemes the arrangements had progressed too far for the proposal to be entertained, but the deputation were informed that their suggestion would be considered with regard to any other house building scheme which the committee might formulate.

SCOTTISH BUILDING TRADES FEDERATION.—The half-yearly meeting of the Scottish Building Trades Federation was held in Dundee on the 25th ult., when representatives attended from all parts of the country—Mr. A. Beveridge, builder, Perth, President, in the chair. The Secretary, Mr. J. L. Selkirk, C.A., Glasgow, submitted the report of the work of the Federation for the past half-year, which spoke of the earnestness and hopefulness with which it had been carried on, and of the advantages which could alone be secured by hearty combination among the various branches of the building trades. It urged the importance of a visitation by the Executive of the various branches' Associations throughout the country. Reference was also made to the recently-appointed Consulting Committee, which consisted of four representatives from each of the four principal cities, whose duty it was to consider all questions affecting wages, working agreements, &c., with a view, when necessary, to united action. The Committee had already made a most encouraging commencement. Special reference was made to the steps which had been taken to secure the adoption of such conditions of contract as might be mutually arranged with the Institute of Architects, with a view to meeting, if possible, certain difficulties and grievances which tradesmen allege they had under the existing system of carrying out contracts, more especially in reference to the delay in obtaining measurement of their work. It was agreed that a deputation should seek an early opportunity of meeting representatives of that body with a view to a conference on the subject. The National Association of Master Builders of Great Britain and Ireland having decided to hold their next annual meeting in Glasgow in the beginning of July—the Exhibition being the chief attraction—it was resolved to extend to them a most cordial welcome on the occasion, in which, it was confidently anticipated, the members of the various branches of the building trade would cordially join.

WEST DRYHAM CHURCH.—The roof of the nave of the ancient Church of St. Andrew, West Dereham, recently collapsed and fell in. Although it has been apparent for some time that the timbers were giving way, it was not considered that the catastrophe was so imminent. The church is an ancient fabric, chiefly in the Perpendicular style. The chancel was restored in 1895, and still remains intact.

WIDTH OF LEEDS STREETS.—At a meeting of the Improvements Committee of the Leeds Corporation on the 25th ult., a new series of by-laws with reference to the construction of streets were discussed and adopted. These proposals have been for some three years under consideration, and now that they have been finally shaped it only remains for them to be sanctioned by the City Council and the Local Government Board. They are intended to have the effect of improving the character of ordinary dwelling-houses, besides widening the streets. In future no street is to be less than 42 ft. in width, but provision is made allowing streets to be made 36 ft. wide with a forecourt (or garden) in front of the houses on each side of 6 ft. in width, and at intervals of not more than 150 yards there must be a street not less than 42 ft. in width. The existing by-law provided simply for a 36-ft. street. At the meeting a deputation attended from the Leeds and Yorkshire Architectural Society consisting of Mr. T. Butler Wilson, President, and Mr. H. Chorley, secretary.—*Leeds Mercury.*

THE MONUMENTAL BRASS SOCIETY.—The sixteenth annual meeting of this Society was held on Thursday, the 25th ult., at 32, Sackville-street, London, the Rev. R. W. M. Lewis in the chair. The Society still continues to carry out its original object, viz., the study, cataloguing, and preservation of these very interesting memorials of the dead. At present a series of articles by Mr. Mill Stephenson, F.S.A., on "The Palimpsest Brasses of England," is being continued in the *Transaction*, copies of which and particulars of membership can be had from Mr. F. W. Short, 51, Mornington-road, Leytonstone, Essex. It might be interesting to mention that Part XXVII, comprises the Counties of Essex, Herts, and it contains over a score of illustrations.

APPOINTMENTS.—The Local Government Board have sanctioned the appointments of the following sanitary officers, viz.:—Mr. E. G. Annis, medical officer, Greenwich; Mr. G. Millson, medical officer, Southwark; Messrs. H. Neighbour and S. Addison, sanitary inspectors in Hammersmith; Mr. J. H. Danson, sanitary inspector in Deptford; Mr. W. Barnes, sanitary inspector in Woolwich.

REGISTRATION OF PLUMBERS.—A meeting of representatives of district councils for the national registration of plumbers was held at the Guildhall on Wednesday, the 24th ult. Belfast, Birmingham,

Bradford, Cardiff, Edinburgh, Glasgow, Leeds, Manchester, Nottingham, and Plymouth sent delegates, and reports were presented showing that since the Conference of Health and Water Authorities and Plumbers was held in Birmingham in October last 2,082 operative plumbers and 404 master plumbers had been registered, and that the applications for registration were so numerous that a vast number still remained to be dealt with. On the motion of Dr. Williams, Medical Officer of Health, Plymouth, it was decided to increase the facilities for the examination of applicants. Various arrangements for securing the more systematic training of plumbers were discussed, and on the motion of Dr. Alfred Hill, Medical Officer of Health, Birmingham, it was resolved that apprenticeship should be encouraged in connexion with the national registration of plumbers, and that a special form of indenture for plumbers' apprentices framed by the Plumbers' Apprenticeship Board of London should be circulated for adoption throughout the kingdom. Mr. Marchbank, Edinburgh, undertook to adapt the form to the requirements of Scotch law.

REGISTRATION OF TITLE TO LAND.—At a general meeting of the Incorporated Law Society held on Friday, the 26th ult., Mr. J. S. Rubinstein moved a resolution to the effect that, in view of the fact that the experimental period of three years mentioned in the Land Transfer Act, 1897, would expire in July, an inquiry into the system of compulsory registration of title in London should be held, in order to ascertain whether or not additional difficulty, expense, and delay are occasioned thereby without corresponding advantage to persons dealing with land. The resolution, after full discussion, was carried unanimously.

WINDOW, TIMBERSCOMBE CHURCH.—In the parish church of Timberscombe, in the heart of Exmoor, a stained glass window has been erected in memory of the late vicar. The subject of the window is the Annunciation. It was designed and executed by Messrs. Fred Drake & Sons, of Exeter.

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE IN LEICESTER.—About sixty bricklayers and builders' labourers have ceased work at the new wholesale market, in Halford-street, in consequence of a dispute as to the introduction of navvies to mix concrete. The builders' labourers, who receive 6d. per hour, claim that the work in question is work of a character which, under Sir William Markby's award, should be done by them, and not by navvies, who are, it is alleged, paid at a less rate per hour. The Employers' Federation claim that the work is essentially work for navvies, and that the bricklayers' labourers are violating the rules mutually agreed upon by their society and the federation in insisting on the discharge of the navvies. The federation contend that things should be continued now as they were, pending arbitration, but the bricklayers' labourers demand that these navvies should be discharged before arbitration is entered upon.

HARTLEPOOL BUILDING TRADE.—A complete stoppage of the building trade in the Hartlepool has just taken place, owing to a strike of bricklayers and plasterers' labourers, who met the proposal of the masters for a decrease of 1d. per hour by making a demand for a 3d. per hour increase in wages. Several hundred men are affected.

THE BRADFORD BUILDING TRADE.—For some time past the conditions of labour in the Bradford building trades have been under active consideration by both employers and employees. There appears to be present to be but little hope of an amicable settlement. The history of the present crisis is briefly as follows:—Six months ago, in consequence of slackness of trade, the master builders gave notice to the men of three alterations of existing conditions; stipulating (1) for a reduction in wages of 1d. per hour; (2) that society and non-society men should be allowed to work peaceably together; and (3) that notice of alteration of rules should expire either on May 1 or November 1, instead of between April 1 and July 1, as at present. The present wages are 9½d. for masons and bricklayers and 9d. for joiners, and the joiners replied to the masters' action by giving notice ten days later of a demand for the increase of their wages by 1d. per hour. In the course of the past few days some attempts have been made to arrive at a settlement. The joiners met the masters about a fortnight ago with no result, and nothing further was arrived at until the 29th ult. The operative masons met their employers on Saturday night, and were offered 9d. per hour—a reduction of ½d. in place of 1d. The condition as to society and non-society men working together was adhered to, but the demand for alteration as to the expiry of notice was waived. The masters, moreover, offered to put all questions at dispute to arbitration. These new terms were considered by the men at a meeting at Barry's Hall, and they decided with practical unanimity to abide by the existing conditions, and refused the proffered arbitration. A meeting of the Bradford Master Builders' Association was also held at the Stone Exchange, Chapel-lane, Mr. Phineas Drake, presiding. The masons' decision was conveyed to the meeting and discussed, and ultimately it was decided

that the following notice should be issued and placarded in all the workshops:—"Bradford Master Builders' Association. Notice.—On and after May 1 the rate of wages will be as follows:—Masons 9d. per hour, joiners 8½d. per hour. Rules.—Society and non-society men to work together. Six months' notice of alteration of rules to be given on either side, to expire on April 30 or October 30." The present situation, therefore, is that the men of both branches of the trade are offered a reduction of ½d. per hour, and that the masters' original claims in the other two respects are maintained. It is understood that the masters viewed with surprise the operatives' refusal of arbitration, but that the offer of arbitration is not withdrawn so far as the masons are concerned. It is also understood that the men are less disposed to accept the other conditions than they are to submit to a reduction of wages. The masters explained that as the state of trade had caused them to give notice of a reduction in the wages of masons and joiners, they could not see their way to grant the advance asked for.—*Bradford Observer.*

BRADFORD JOINERS.—Since the Bradford branch of the Amalgamated Society of Joiners received notice of a reduction they have started a workshop of their own.

BRICKMAKERS' STRIKE, EDMONTON.—The strike of brickmakers which has been in progress for some weeks at Edmonton has ended. The dispute arose on the masters wishing to reduce the rates of pay. The masters have now given way, and the brickmakers return to work on the same wages as last year.

LEGAL.

THE NEW STREET FROM HOLBORN TO THE STRAND.

The case of the London County Council v. the Metropolitan Electric Supply Company, Limited, was concluded on the 25th ult. before Mr. Justice Farwell in the Chancery Division. The case raised a question of interpretation of a section of the London County Council (Improvement) Act, 1890.

It appeared that under the Metropolitan Electric Supply Company Mid-London Lighting Order, 1886, confirmed by the Electric Lighting Orders Confirmation (No. 5) Act, 1890, the defendant company had power to supply electrical energy within the district which includes the whole of the area which might be taken by the County Council under the powers of the London County Council (Improvements) Act, 1890, for the intended new street from Holborn to the Strand. When this Act was passed the defendants had a station, buildings, machinery, and works for the purpose of electric lighting on a site partly freehold and partly leasehold in Sardinia-street, the whole of which was required to be taken by the County Council for the purposes of their proposed improvements. A statutory bargain was arrived at between the plaintiffs and the defendant company, which was embodied in Section 55 of the Improvements Act which provided shortly that (1) the Council should not enter upon or take any part of the existing site of the defendants' station until after the expiration of two years after they had provided at their own expense and vested in the defendants a site available for the erection of a generating station, and (2) that the Council should acquire the freehold and all other interests in the new site and should convey to the Company the freehold of so much of the new site as should be equal in area to the freehold portion of the existing site free of expense to the Company, and should also grant to the Company free of expense a lease of the remaining portion of the new site upon terms equivalent to those of the lease under which the Company held the leasehold portion of their existing site; (3) that it should be lawful for the Company on the site so provided to erect, maintain, and work a station for generating, transforming, and transmitting electrical energy. The important question arose under Sub-Section 7, which provided:

"The Council shall, on or before the date of the conveyance and lease of the new site, pay or secure, to the satisfaction of the Company, a sum equal to the costs and expenses of erecting and fitting up a new generating station upon the new site with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and all expenses incurred in and in connexion with taking up and replacing, relaying and altering mains and lines owing to the carrying out of the provisions of this Act." A dispute arose as to the interpretation of this sub-section, and the plaintiffs sought a declaration that, according to the true construction of the section, they were only bound to pay or secure to the satisfaction of the Company a sum equal to the costs and expenses of erecting and fitting up a new generating station upon the new site with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and were not bound to pay or secure any sum equal to the costs and expenses of erecting and fitting up a generating station with new plant of a capacity to generate and supply electrical energy to an output of 5,000 kilowatts or any number more than 4,000 kilowatts, on the ground that under unusual circumstances a more powerful plant might be required to generate and supply 4,000 kilowatts or

on any other ground whatever. The defendants contended that the sum claimed by them was based on the station and plant being of a capacity to generate and supply such output as a matter of practical commercial working, and that it was impossible for them to generate and supply an output of not less than a fixed amount without having, in addition to the *minimum* plant capable of generating or supplying such an amount temporarily, spare or extra plant in case of a breakdown or repairs, &c.

Mr. Justice Farwell, having heard expert evidence, held that the plaintiffs were right in their contention, and granted a declaration to that effect. He also awarded them the costs of the action.

Mr. Haldane, K.C., Mr. C. E. Jenkins, K.C., and Mr. Metbald appeared for the plaintiffs, and Mr. Balfour Browne, K.C., Mr. Cripps, K.C., Mr. Butcher, K.C., and Mr. Sargent for the defendant company.

CASES UNDER THE LONDON BUILDING ACT, 1894:

DICKSEE v. HOSKINS.

THE case of Dicksee v. Hoskins came before a Divisional Court of King's Bench on the 25th ult., on the appeal of the District Surveyor from the decision of a Metropolitan Police Magistrate allowing an appeal under the London Building Act, 1894, from a notice of objection to a proposed building served by the appellant upon the respondent, a builder. The question to be decided was whether the proposed building came within Section 74 (2) of the Act of 1894. Sub-Section 2 of the section runs as follows:—"In every building exceeding ten squares in area used in part for purposes of trade or manufacture and in part as a dwelling-house, the part used for purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the parts used as a dwelling-house shall be constructed throughout of fire-resisting materials." The building in question was No. 57, Old Kent-road, and was the re-erection of an old beerhouse called the Horseshoe. It was when erected to exceed ten squares in area, and was intended to contain in the basement beer and wine cellars; on the ground floor a bar, public lobby, saloon-bar, private-bar, parlour, and a public room; on the first floor a sitting-room, three bedrooms, and a kitchen; and on the top floor attics. The old house was, and the new when created was to be, used for the sale of wine and beer to be consumed on and off the premises. The trade was to be carried on in the basement and ground floor, and the licensee and his family were to reside in the upper floors of the building, and the whole of the building was to be covered by the Justices' certificate and Excise licence. The floors separating the ground floor from the first floor and the staircase leading to the first floor were not intended to be constructed of fire-resisting materials, and the magistrate found that if Sub-Section 2 of Section 74 of the Act applied to the building, the provisions of that section would be contravened. He also found, as a fact, that the basement and ground floor of the building were intended to be used for the purposes of the trade of the beerhouse, and that the part above the ground floor was intended to be used as a dwelling-house for the licensed occupier, but held that the case was governed by the decision in "Carritt v. Godson," and allowed the appeal, overruling the objection of the District Surveyor. Hence the present appeal of the District Surveyor.

At the conclusion of the arguments of Counsel, the Lord Chief Justice held that the section was intended to apply to buildings part of which were used for trade and manufacture and the other part as a dwelling, and that it was not intended to apply to a building certain rooms of which were used as a dwelling. He thought, therefore, that the appeal should be dismissed.

Mr. Justice Lawrence concurred, and the appeal was accordingly dismissed.

Mr. Horace Avory, K.C., and Mr. Rowsell appeared for the appellant; and Mr. Danckwerts, E.C., and Mr. Craice for the respondent.

CROW v. WHITECHAPEL BOARD OF WORKS.

IN a specially constituted Court of King's Bench composed of Justices Grantham, Kennedy, and Darling, the hearing was resumed on Saturday, the 27th ult., of the case of Crow v. the Board of Works for the District of Whitechapel. The case was argued before Mr. Justice Kennedy and Mr. Justice Darling last December, but their lordships then disagreed, and the case now came on for a rehearing before an additional Judge, Mr. Justice Grantham.

This was the defendants' appeal from a decision of Mr. Dickinson, the magistrate sitting at the Thames Police-court in June last. It appeared that a summons was taken out by Mr. Crow, the District Surveyor, against the defendants for not having given him notice under Section 145 of the London Building Act, 1894, before commencing the construction of a number of boxes or inspection cham-

bers under the streets in the district for the purpose of electric lighting. The defendants were the local authority within the meaning of the Electric Lighting Acts, 1882 and 1888, for the district, and in the year 1892 were granted by the Board of Trade, pursuant to the Electric Lighting Acts, 1882 and 1888, in respect of such district a provisional order called the Whitechapel District Electric Supply Order, 1892, which was afterwards confirmed and came into force on June 27, 1892. By Sections 11 and 12 of this order, the "undertakers" were authorised to construct in any street any such boxes as might be necessary for purposes in connexion with the supply of electric energy, including apparatus for the proper ventilation of such boxes. The sections further provided that "every such box shall be for the exclusive use of the undertakers and under their sole control, except so far as the Board of Trade may otherwise order, and shall be used by the undertakers only for the purpose of leading off service lines and other distributing conductors, or for examining, testing, regulating, measuring, directing, or controlling the supply and energy, or for examining or testing the condition of the mains or other portions of the works, or for other like purposes connected with the undertaking, and the undertakers may place therein motor switches and other suitable and proper apparatus for any of the above purposes. Every such box, including the upper surface or covering thereof, shall be constructed of such materials, and shall be constructed and maintained by the undertakers in such manner as not to be a source of danger whether by reason of inequality of surface or otherwise." Section 12 further provided that the undertakers should one month before the commencement of such works, serve a notice upon the Postmaster-General describing the proposed works, together with a plan of the proposed works, and, in addition, a like notice and plan upon the County Council. The defendants did not, before commencing the construction of the boxes, serve Mr. Crow with notice of the intended work, under Section 145 of the London Building Act, 1894. Mr. Crow's contention was that the boxes came within the definition of "building structure or work" in Section 145, and that the defendants were bound before commencing the work to serve upon him as the District Surveyor a "building notice" as prescribed by the section. The defendants contended that the Act of 1894 did not apply at all to boxes constructed in the streets under the Provisional Order, inasmuch as the order contained a complete code regulating the materials, situation, and mode of construction of such boxes, and provided a complete machinery for enforcing such regulations, and with which special code and machinery the London Building Act of 1894 was inconsistent. The magistrate found as a fact that the boxes so constructed were "building structures or works" within the meaning of Section 145 of the London Building Act, 1894, and having regard to Sections 72, 201, and 203 of the said Act, he held that the provisions of Section 145 were not inconsistent with the special Act and imposed on the defendants the nominal penalty of 1s. and ordered them to pay 10l. 10s. costs. Hence the present appeal of the defendants.

Mr. Dickens, K.C., and Mr. Talbot appeared for the appellants (defendants); and Mr. Horace Avory, K.C., for the respondent (plaintiff).

At the conclusion of the arguments their lordships reserved judgment.

EMPLOYERS' LIABILITY ACT.

HOW SHOULD A CEILING SCAFFOLD BE FORMED?

AT Marylebone County Court on Monday, before Judge Stonor and a jury, Thomas Davies, a plasterer, Kensal Green, N.W., sought to recover damages, under the Employers' Liability Act, from Mr. David Henry Nash, builder, &c., Paddington, W., the claim being in respect of personal injuries sustained by the plaintiff owing, it was alleged, to a defect in the plant provided by the defendant, and negligence for which he was responsible.

Mr. H. Morris, counsel, appeared for the plaintiff, and Mr. E. Meller, counsel, for the defendant.

The plaintiff stated that on October 19 last he was in the employ of the defendant, doing plastering work at some new houses in Harvist-road, N.W. A scaffold, or platform, about 5 ft. high, had been erected in one of the rooms to enable the plasterers to put up the ceiling. This scaffold extended over the whole room, with the exception of a small space at the doorway, where there was a hole through which the men could pass up to the scaffold or down, and by which the plasterers sent up "course stuff" and the plaster. While working upon this scaffolding, and looking up at the ceiling, he (the plaintiff) slipped down the hole near the door, dislocating his right shoulder and bruising some of his ribs. In consequence of the accident he was prevented from doing any work for thirteen or fourteen weeks, for which he claimed 2l. a week. He further claimed with respect to the pain and suffering.

Cross-examined: He had got upon the scaffold and down again by means of the hole near the doorway both on the day of the accident and the previous day. He had been a plasterer for many

years, and considered that a hole in a scaffold, such as the one in question, was dangerous. A short board, he maintained, should have been used to cover the hole, the board being pushed aside when necessary.

No other witnesses were called for the plaintiff. The defendant maintained that the scaffold in question was erected in the ordinary way, and that it was customary to leave a hole in the platform without covering it with a small board.

The Judge: It is not practicable to put a short plank across the hole?

The defendant: I have never seen a plank or board put across.

Mr. Ernest George Harvey, builder, said that the defendant was doing certain work upon the houses in question under a contract with himself (witness). He had inspected the scaffold, and found it erected in the only way that he had ever seen such scaffolds put up.

The Judge: What about the hole?

The witness: It is usual to leave a hole as described.

George Townsend, foreman to the last witness, said that the scaffold in question was a very good one. It was usual, so far as his experience went to show, to have a hole in the platform.

The Judge: The only question of importance in this case is whether the hole was necessary and proper, and the balance of evidence is to the effect that it was so.

The jury found that the scaffold was properly and safely erected, and that the hole was necessary and proper. This was a verdict in favour of the defendant, for whom his honour gave judgment.

The Judge: There can be little doubt that the man is entitled to claim under the Workmen's Compensation Act.

Mr. Morris: There seemed to be some doubt with regard to a certain point in connexion with that Act.

The Judge: I cannot see the slightest reason to doubt. I think I cannot not find that there was "gross negligence" on the part of the plaintiff.

It was understood that the plaintiff would bring another action under the Workmen's Compensation Act, joining Mr. Harvey as a respondent. The whole question of costs was reserved.

IMPORTANT ACTION BY CONTRACTORS.

IN the Court of Appeal, composed of the Master of the Rolls and Lord Justices Collins and Romer, on the 20th ult., judgment was delivered in the case of Leslie & Co., Limited, v. the Managers of the Metropolitan Asylums District on the appeal of the plaintiffs from the judgment of a Divisional Court of King's Bench, composed of Justices Bigham and Phillimore, on April 2, 1900, the question in issue arising upon a contract entered into between the plaintiffs and the defendants for the erection of a hospital for infectious fevers at Hillier Green, Lewisham, the case coming before the Divisional Court by way of appeal by the defendants from the decision of an Official Referee. The case was reported fully in the issue of the *Builder* for April 7, 1900. A great part of the work in question had been let out to sub-contractors and experts called specialists, and the question for decision was as to who was to be responsible for alleged delay on the part of these sub-contractors. The contract was dated July 23, 1895, and it provided that the plaintiffs should execute "the works" shown on the plans, including the chimney stacks and heating apparatus. The work had to be completed in two years, and the price was to be 210,688l. The material clauses of the contract were these:—"The managers (*viz.*, the defendants) reserve to themselves the right to employ other parties to execute the works for which provisions are made, and to deduct the full provided amounts (*i.e.*, the prime cost plus 10 per cent. thereon) from the contract sum. In such cases the contractors (the plaintiffs) are to allow such parties every facility for the execution of their several works simultaneously with their own. The managers are to be at liberty to omit any provisional sums or quantities. The contractors are to pay the sub-contractors the amount provided in the contract for such purpose, or less or more as may be certified, and the payments thus made will be considered as work done by the contractors, and will be included in the certificate to the contractors next following such payment. No payment is to be made to such sub-contractors, except upon the architect's certificate. The contractor is to pay such amount as may be certified from time to time, within seven days from the date of the certificate, and should the contractor neglect, or refuse, to make such payment within the said period, the managers shall be at liberty to pay the amount direct to such sub-contractor, and to deduct from the contract sum the gross amount which the contractors have included in their estimate in respect of such work and his profit thereon, the amount so to be deducted not being less in any case than such amount so certified. The contractors are to attend with all building trades upon the sub-contractors, which is to include "cutting away from the same and making good after the same, and allowing the free use of such plant, tackle, and scaffolding as the contractors may be using for their

own purposes." The contract also provided that the contractors were to allow such persons full opportunity to carry on their works simultaneously with their own. The contract also provided for the retention by the defendants of 10,000*l.* as security for its due performance. Alterations and omissions from the specifications were to be allowed, and made only on the direction in writing of the architect. Among the works to be erected were twenty-nine chimney-stacks at the price of 137*l.* 10*s.* for each stack. The contract went on: "The contractor shall provide the sum of 137*l.* 10*s.* prime cost for each central stack of flues in large wards above the level of the ground floor." It then provided how they were to be constructed, and that they were to be finished complete by a specialist potter. It also provided that the contractors were to supply all necessary "scaffolding, plant, water, and hoisting." The plaintiffs then communicated with Messrs. Doulton, who agreed to do the necessary work. Part of the claim in the action arose from the alleged delay on the part of Messrs. Doulton to do the necessary work. Another claim arose from a sub-contractor for the supply of the necessary steam and hot-water apparatus. The clause relating to that provided that the hot-water supplies to baths, lavatories and sinks, except where otherwise specified, should be done by specialists; but the contractor was to attend on, and cut a way for, and make good after them. A sub-contract was made on February 2 between the plaintiffs and Messrs. Berry & Sons, by which the latter agreed to supply this apparatus for 11,000*l.*, and it was said that Messrs. Berry had been guilty of delay in executing this work. Owing to these alleged delays, the plaintiffs could not complete the works as per the architect's certificate and payment accordingly. The plaintiffs therefore claimed damages on the footing that there was an obligation on the defendants to see that the work was done by the specialists and sub-contractors within a reasonable time. The case was referred to an Official Referee, when counsel for the defendants asked the learned Referee to non-suit the plaintiffs on the ground that Messrs. Doulton and Berry on the contract were the sub-contractors with the plaintiffs, and any delay lay against them and not with the defendants.

The learned Referee refused to non-suit, and from this decision the defendants appealed to the Divisional Court, which held that in the circumstances the plaintiffs were not entitled under the contract to recover the damages from the defendants. From this decision the plaintiffs now appealed.

Mr. R. M. Bray, K.C., and Mr. T. Ribton appeared for the appellants (plaintiffs); and Mr. English Harrison, K.C., and Mr. H. Smith for respondents (defendants).

The Master of the Rolls in giving judgment, having referred to the material clauses in the contract and to the facts, said that two instances as to what took place with regard to the specialists had been argued before them; one relating to Messrs. Doulton & Co.'s work and the other to Messrs. Berry & Co. for the hot-water arrangements. Having gone in detail through the matters relating to Messrs. Doulton & Co.'s work, in his lordship's opinion it would not be necessary to go in detail as to what took place with regard to Messrs. Berry & Co. Messrs. Doulton & Co. were behind in the erection of their work whereby the plaintiffs were hindered in getting on with the other work contracted for under their contract. How in these circumstances were the defendants liable for the delays of Doulton & Co.? The plaintiffs' case was that the defendants were liable to them for these delays. How so? The defendants never contracted with Messrs. Doulton & Co. The persons who contracted with Messrs. Doulton & Co. were the plaintiffs, and the plaintiffs alone. Messrs. Doulton & Co. were sub-contractors, and their work was work which the plaintiffs had contracted with the defendants to provide. The defendants never paid Messrs. Doulton & Co. one penny for their work, and were never under any liability to them. Messrs. Doulton & Co. were paid by the plaintiffs for their work, and his lordship thought that the Divisional Court were right in holding that the defendants were not liable to the plaintiffs for the delays of Messrs. Doulton & Co. If any one had a remedy against Messrs. Doulton & Co. for delay, it was the plaintiffs and not the defendants. It was next argued that if the plaintiffs could sue Messrs. Doulton & Co. for delay, they could sue the defendants as trustees for the defendants, and if the plaintiffs recovered damages against Messrs. Doulton & Co. for delaying them, they would have to hand over the damages recovered to the defendants. His lordship did not agree with that contention. The truth was there was no trust at all. Messrs. Berry & Co. were also behindhand with their work, and what his lordship had said with regard to Messrs. Doulton & Co. applied to them. Their case was fully argued out and he had nothing to say more than this, that Messrs. Berry's case was, if anything, stronger than Messrs. Doulton & Co.'s case, because the order given in that case was more specific in detail than that given in Messrs. Doulton & Co.'s case. In his lordship's opinion the decision of the Divisional Court was right and the appeal must be dismissed.

Lords Justices Collins and Romer concurred, and the appeal was accordingly dismissed with costs.

WORKMEN'S COMPENSATION ACT.

WHAT IS AN "ACCIDENT"?

THE case, *Perry v. Baker & Sons*, reported in these columns last week, came again before Judge Stonor on Tuesday at Marylebone County Court.

The applicant, it may be recollected, was Richard Perry, a carpenter and joiner, 11, Napier-road, College-park, N.W., who brought an action under the Workmen's Compensation Act against Messrs. Baker & Sons, Hythe-road Works and High-road, Willesden Green, the claim being in respect of personal injuries said to have been sustained by the applicant whilst in the respondents' employ. On September 15 last the applicant was ordered by the respondents' foreman to make a large, heavy seat. While lifting this piece of work, to see a joint underneath, he strained a muscle in the side of his abdomen. The chief points in the defence were that the man was told not to attempt to lift the seat without assistance, and, as a point of law, that the man had not met with an accident within the meaning of the Act.

Mr. A. H. D. Nonweiler, solicitor, now appeared for the applicant, and Mr. Hohler, counsel, for the respondents.

Mr. Nonweiler reminded his Honour that the case had been adjourned after the question was raised as to whether there had been an accident within the meaning of the Act. He now wished to draw attention to the fact that the respondents, in their answers to interrogatories, stated that they had paid the applicant all the compensation to which he was entitled under the provisions of the Workmen's Compensation Act.

Mr. Hohler pointed out that in another portion of the answers to the interrogatories it was submitted that the applicant's injuries were not caused by an accident arising out of, and in the ordinary course of, his employment.

Mr. Nonweiler said it was evident that the respondents had admitted that the applicant was entitled to some compensation in respect of his injuries, and having paid the man compensation to January 22, 1901, it was useless for the learned counsel on the other side now to come before the Court and submit that there had been no accident.

The Judge remarked that the respondents, in their answers, distinctly denied that there had been an accident arising out of, or in the ordinary course of, the man's employment.

Mr. Nonweiler, quoting from Pitt-Lewis's "Yearly County Court Practice," pointed out that an accident was there so defined as "to include every phase of personal injuries, provided they involved some fortuitous and unexpected event."

The Judge remarked that in several cases recently decided it had been held that when something happened to a person, without an external cause to produce it, there was no accident. At least, such was the tendency of the decisions, but he could not say whether, after a few more appeals had been brought before the House of Lords, a proper and satisfactory interpretation of an accident might not be given.

Mr. Nonweiler quoted from the case *Hamlyn v. The Crown Accident Insurance Company* (1893, 1 Q.B. 750), where a man, in stretching to pick up a marble which had rolled on the floor, strained and hurt himself; it was held to have been an "accident." In the present case also he (Mr. Nonweiler) asked his Honour to say that there was an accident within the meaning of the Act.

The Judge: I should have no hesitation in saying that, from a common-sense point of view, there was an accident, but I should not be prepared to say that there was an accident within the meaning of the Act.

Mr. Hohler went on to submit that in the present case, although the man sustained "injuries," he did not meet with an "accident" within the meaning of the Act. The man's exertion in lifting the seat might have caused his injuries, but no one could say that there was an accident. Suppose, continued the learned counsel, a man running to catch a train fell, and, putting out his hand, injured it. That would be an accident. But if, on the other hand, the man fell, owing to the failure of his heart, there would be no "accident," although there might be an "injury."

The Judge: In the present case there is evidence of a muscle being strained or giving way, and I cannot see the difference between an instrument or tool breaking and a muscle giving way. There would appear to be an accident in each case.

Mr. Hohler submitted that while the breaking of an instrument might be looked upon as an accident, the breaking or straining of a muscle involved an "injury," and not an "accident."

The Judge: I must reserve my judgment.

ACTION BY AN ARCHITECT FOR FEES.

THE hearing of the case of *Matcham v. The Northern Theatres Company, Limited*, was concluded on the 29th ult. before Mr. Justice Mathew and a Special Jury in the King's Bench Division. It was an action by Mr. Frank Matcham, architect, against the defendants to recover 1,050*l.* 12*s.* for fees and charges for designing plans and obtaining tenders for the erection of a proposed new theatre

at Huddersfield. The case for the defendants was that the charges were excessive and unreasonable, and further that plaintiff was employed as their architect for the construction of the theatre for a commission of 4 per cent. on the cost of the building, subject to the express condition that the cost of the theatre was not to exceed 15,000*l.* That the minimum cost of the theatre if built according to the plaintiff's plans would have been 28,000*l.*, and they therefore decided that the building should not be proceeded with, and that the work executed by the plaintiff was of no use to the defendants. In these circumstances the defendants pleaded that they were not bound to pay the plaintiff anything.

The plaintiff in his evidence stated that on May 3, 1898, he saw Mr. Robinson, one of the directors of the defendant company, with reference to the erection of the theatre, and then it was mentioned that the cost of the theatre was to be about 15,000*l.*, but plaintiff said he could express no opinion as to the cost until he saw the site. He was appointed architect, and was to be paid 5 per cent. on the lowest tender. A local architect was to act with him, and was to receive 1 per cent. out of his (plaintiff's) commission. He did all the necessary work and employed a quantity surveyor to get out the quantities. On January 17, 1900, the directors made up their minds not to proceed with the erection of the theatre. No suggestion was ever made up to the time that he was not to be paid if the cost of the theatre exceeded 15,000*l.* It was at first resolved that the theatre should be built of brick and terra-cotta, but the ground landlord objected to this and insisted on stone being used. This involved greater expense than had been foreseen.

Evidence was given that the plans and quantities were carefully prepared, and that the extras proposed to be added to the theatre involved an additional cost of 7,405*l.* When the work was not carried out the custom was that the architect should receive 2½ per cent. on the estimated cost of the building.

For the defence it was contended that the essential point of the plaintiff's employment was that the cost of the theatre was to be limited to 15,000*l.*, and that he was to prepare plans for a building to be constructed at that cost, but the plans which he had prepared were of no use to the defendants, for the theatre he designed would have cost 28,000*l.*

Evidence having been given in support of the defendants' case the jury in the result returned a verdict for the plaintiff for 325*l.*, and judgment was entered accordingly.

Mr. Crispe, K.C., and Mr. Spencer Bowen appeared as counsel for the plaintiff; and Mr. Lawson Walton, K.C., and Mr. Willes-Chitty for the defendants.

IMPORTANT BUILDING CASE.

THE case of *in re an Arbitration between Ford & Co. and Bemrose & Sons, Limited*, came before a Divisional Court of King's Bench, composed of Justices Kennedy and Phillimore, on the 1st. inst., in the form of a special case stated by Mr. Robert Vigers, the umpire, under a submission contained in a contract dated May 28, 1895, and made between Messrs. Bemrose & Sons, Limited, printers, of the one part, and Messrs. Ford & Co. of the other part. From the case stated it appeared that at some time prior to the date of the contract of May, 1895, Messrs. Bemrose instructed Mr. Ernest R. Ridgeway, an architect, of Long Eaton, to prepare on their behalf plans for the erection of certain works in Park-street, Canal-street, and Carrington-street, Derby, and to invite tenders for the execution of such works. Mr. Ridgeway prepared the plans and invited tenders upon such plans and certain conditions of contract and bill of quantities, and with such tender furnished a schedule of prices. Such schedule of prices was for the purpose of determining the amount to be paid or allowed in respect of any alterations or deviations from the original plans which might be determined upon during the progress of the works, and the prices in the schedule were the prices referred to in the contract as the prices upon which the contract was based. Messrs. Ford's tender was accepted, and the contract in question entered into between Messrs. Bemrose and Messrs. Ford. The contract followed and incorporated and formed one document with a copy of the conditions of contract upon which Messrs. Ford tendered. The material clauses of the contract provided that the work was to be executed in strict accordance with the requirements of the specifications and drawings to the satisfaction of Messrs. Bemrose or their architect. That the drawings and specifications are to be considered as equally binding on the contractors who undertake the execution of the work, and if any part is omitted from the drawings and specifications which is usually noted or given or described in them, and which may be reasonably inferred from them as being necessary to properly carry out and complete the works, the same shall be equally binding on the contractors as if it had been specially shown or described. Any alteration of the works contracted for which may be decided upon during their progress must be carried out at prices on which the contract is based, and the value of the alteration or deviation from the original plans, after being so calculated by the contractors and the architect, shall be added to or deducted from the

amount of the contract as the case may be, but in no case with any alteration or deviation from the original plans and specifications be allowed to invalidate the contract." The contract provided that all disputes should be referred to arbitration under the Arbitration Act, 1880, and contained a covenant by Messrs. Ford that they would "do and perform the whole of the works required in accordance with the plans and specifications for the erection of the new works, and provide all labour, plant, and materials, &c., of whatsoever kind required, at and for the sum of 10,550*l.*" Messrs. Ford completed the work included in the contract, and on April 1, 1900, Mr. Ridgeway, by his final certificate, certified that there was a balance owing to Messrs. Ford of 1,530*l.* 13*s.* 5*d.*; but the latter being dissatisfied with it, and other disputes having arisen under the contract, recourse was had to the arbitration clause in the contract. It was alleged before the arbitrator, and the arbitrator found as a fact, that the quantities set forth and stated in the bill of quantities upon which tenders were invited were in material and substantial respects insufficient, and that the actual quantities of the works required to be executed in carrying out the works in accordance with the plans exceeded those in the bill of quantities. It was also alleged before the arbitrator, and found by him to be the fact, that it was a general usage in the building trade that where tenders are invited for the erection of works in accordance with plans, and a bill of quantities is furnished, a person making a tender is not expected to verify the quantities himself, but is expected to assume that the quantities are correct and to tender upon that assumption; that if such quantities proved to be greater or less than the actual quantities the price was to be reduced or increased by an amount ascertained and determined by the scale of prices given in the tender as the scale by which payment for extras were to be determined. The arbitrator also found as a fact that Messrs. Ford did not verify the quantities, and tendered and entered into the agreement on the assumption that the quantities were correct. He also found that various alterations of the works contracted for were decided upon during the progress of the works, and that the sum of 3,281*l.* was to be added to the contract price in respect of such alterations and deviations; that the total value of the work executed, at the prices upon which the contract was based, was 13,830*l.*; and that 8,730*l.* had been paid to Messrs. Ford by Messrs. Bemrose.

The questions left to the Court by the arbitrator to determine were:

1. Whether in ascertaining the amount to be paid by Messrs. Bemrose to Messrs. Ford regard was to be had to the aforesaid usage in the building trade.

2. Whether Messrs. Ford were entitled only to be paid the sum of 10,550*l.* mentioned in the contract, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans determined upon during the progress of the work, or

3. Whether Messrs. Ford were entitled to be paid the value of all the works actually executed by them at the prices upon which the contract was based, and whether such value should be more or less than the sum of 10,550*l.* mentioned in the contract.

The arbitrator certified that if the Court answered Question 1 in the affirmative, 5,090*l.* remained due to Messrs. Ford; Question 2 in the affirmative, 2,298*l.* 10*s.* was due to Messrs. Ford; and question 3 in the affirmative, 5,090*l.* was payable by Messrs. Bemrose to Messrs. Ford.

Mr. Joseph Walton, K.C., and Mr. Hudson appeared for Messrs. Ford & Co., and the Hon. Alfred Lyttelton, K.C., and Mr. Coventry for Messrs. Bemrose & Sons, Limited.

At the conclusion of the arguments of counsel, Mr. Justice Kennedy, in giving judgment, said that he and his learned brother were both of opinion that the builders were entitled to succeed. The builders accepted a contract to build certain structures for a definite sum of 10,550*l.*, and they accepted that burden upon the basis of a certain plan which formed part of the contract, and which showed what was to be built. They also accepted the contract on the basis that a document furnished by the building owners formed part of the contract, viz., a document which was in a sense a bill of quantities and in a sense a specification. The contract was accepted by the builder by a tender based upon that specification and upon the plan. In his opinion, he thought the builders had a right to say that they had contracted upon the basis of the accuracy of the representations contained in the quantities forming part of the specification. The builder said, "It is true I agreed to erect seventy-two buildings as planned for 10,550*l.*, but only upon the basis that the quantities required to be put into that building to perform my work do not exceed the quantities which you yourself represented in the specification were all that were necessary. In his Lordship's view, the true and logical way to put the builders' case before the arbitrator was that there had been a breach of that which they were entitled to treat as a representation or warranty forming part of the contract, and to the extent to which the warranty was not fulfilled, and they were thereby damaged, they would be entitled to receive compensation. His Lordship was of opinion that there was no reason to decide the question of usage

raised before the arbitrator, because in the circumstances he should hold that the builders were entitled to recover the amount claimed irrespective of any custom or usage in such a case.

Mr. Justice Phillimore concurred, and judgment was accordingly entered for Messrs. Ford & Co., the builders, for 5,090*l.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

27.—ELECTRICAL ARC LAMPS: *H. Lyon and J. B. Talbot-Crosbie.*—The frame of an enclosed arc lamp comprises a cover, a central tube, an insulated guide, and other parts; to a screwed projection from a plate is attached, with packing and a coupling-nut, a flanged arc-enclosing cylinder; a packed collar and nut clamp the lower carbon holder on to the cylinder, and a screw-nut fastens the upper carbon in a split socket mounted upon a tube that slides in a guide and is sustained with a clutch worked by the tubular core of series and blunt coils after the kind specified in No. 17,808 of 1894; plates carry the solenoids which have an adjustable stop-nut for limiting the stroke of the core; the tube which carries the split socket is passed through the core, and its piston, mounted upon a rod, acts as a dash-pot.

41.—BUILDERS' WORK: *A. Rincklake.*—For the construction of ceilings, roofs, and arches the inventor employs expanded or perforated metal or else wire gauze to serve as curved openwork permanent centres, to be fixed between the flanges of the girders. Over the centering thus obtained is stretched a cloth of jute canvas, and then layers of mortar, plaster, or cement; a layer of cement and masonry or brickwork should be filled in the space above.

57.—MEANS OF ESCAPE FROM FIRE: *J. F. Bales.*—The main principle of the invention lies in fitting lifts in the interior of hollow pillars or columns that are built up against the front of the building; the pillars are open at their sides, and persons can effect their escape by means of a platform (in front of the windows) from which they can make their way to cages within the pillars, the platform being hinged on the lift, from which it can be lowered out with a rope; in another shape a platform extends between two adjacent cages with which it will both rise and fall.

70.—REFACING OF VALVE SEATS: *A. A. Jones.*—A tool for use in refacing valve seats comprises a cone which is to be screwed into the opening in the valve casing, and a hub (mounted upon the same axis) which is then screwed down until a spiral spring beneath the cone forces the cutter against the valve seat, when the cutter can be turned with a wrench.

90.—TILES FOR ROOFING PURPOSES: *E. Hufters and P. Bräidenbach.*—The upper portion of the tile is dished and has an upper rib with a middle drainage channel or groove. At the top of the side groove is a projection that will prevent water from entering into the groove, whilst its flow is facilitated with recesses that are cut in the underside of the tile. A moulding machine for the tiles of clay, cement, and other materials has a metal mould-plate in a table. After the clay has been levelled with a straight-edge the grooves are fashioned by means of two arms pivoted at 90 deg. in respect of one another at the sides of the table and moved by a counter-weighted foot-lever and links. Another foot-lever, which is pivoted on to a plate having vertical pins that slide through the table and press against the mould-plate serves for lifting the loose mould-plate with the moulded tile.

108.—NIPPERS FOR GRIPPING OR CUTTING PURPOSES: *W. A. Bernard.*—The jaws are pivoted on to connecting-plates as well as on to the hollow handles, and are spread out at their ends. To the handles and jaws are pivoted respectively two bars which extend beyond the handle-pivots, so that they may carry screws for stops. The nipper is held open, under ordinary conditions, by means of a spring that presses upon one handle and one bar. The plates and bars will freely pass over the wire or other work which is to be gripped or cut.

112.—A COMPOSITION FOR FLOORINGS, LININGS, AND OTHER PURPOSES: *S. F. Ridley, G. H. Whitley, and W. R. Whitley (Ridley, Whitley, & Co.).*—The material consists of granulated cork-waste, paper, wood, rags, mealy coals, and other substances mixed with some binding material that contains lime and casein, subjected to great pressure and then heated to a temperature of between 100 deg. and 200 deg. Centigrade that will harden the casein. The compound is described as being available for many various uses, and reference is made to No. 19,459 of 1892.

151.—AN APPLIANCE FOR TRAPS: *W. Kesselring and E. Röhrenbacher.*—The inventors' object is to provide means for preventing the trap from becoming unsealed. They provide it with an auxiliary plate so arranged as to form an additional passage which makes a junction between the top of the outlet chamber and the bottom of the inlet.

163.—ELECTRICAL SWITCHES: *P. C. McFarlane and D. Reid.*—For ensuring a make and a break

periodically a contact-spring is fitted upon one of the arms of an escapement from which, however, it is insulated. The spring is connected by means of a spring to a terminal, and at intervals will make contact with pins which are mounted upon the escapement wheel.

164.—INCANDESCENT LAMPS (ELECTRICAL): *C. M. Stead.*—The central reflector, which is surrounded with a filament, may be suspended with a thin glass stem from either end of the lamp-bulb. The filament consists of either a single coil or of a three or four fold filament carried near the reflector. If the lamp-bulb is made annular in shape it will encompass the filament and have an open recess for taking the silvered glass or opal ribbed reflector.

166.—A SPANNER: *T. W. Wills.*—The fixed jaw is mounted upon a toothed stem upon which the movable jaw slides; a block that slides crosswise through the movable jaw serves to lock it, and teeth upon the block are set in engagement with the teeth upon the stem of the movable jaw. When the plain portion of the block has been forced over the teeth upon the stem, the movable jaw is liberated for its necessary movement.

171.—PROCESS OF SAWING STONE: *J. T. Whellam.*—At the corner-posts of the carriage (constructed of angle and H-bars) are wheels which guide the saw-frame. Cranks and connecting-rods impart a reciprocating motion to the carriage, which is mounted upon wheels that run upon fixed rails, the arc turned upwards at the end of the travel. The stone trolley is caused to run underneath the carriage from one end, and the saw-frame can be raised by means of a winch. The frame has slotted bars at its ends in which the saws are secured with wedges.

187.—COPING-TILES: *W. A. Williams.*—Glass, slate, stone, concrete, metal, or other tiles are fashioned with angular, curved, or M-shaped sections, and with over-hanging gutters in order to prevent water from trickling down and wetting the walls. A stop or flange can be made at the end of the channel of the tile, together with an outlet hole for the attachment of a water-pipe, the end tiles have throated lips for carrying water clear from the wall, and the tiles are set in cement with flanged, rebated, dove-tailed or tongued and grooved joints.

206.—A TOOL FOR LIFTING PURPOSES: *J. C. W. Schöpfer.*—For lifting heavy bodies as well as for extracting nails, and so on, is devised a tool which comprises a lever, of which the rounded end will roll upon the curved face of a frame or block. In order that the extreme point of the rounded end of the lever shall move in a vertical line, the radii of the curved surface and of the rounded end are in the ratio of 2:1. In order that the lever shall not slide downwards, it is pivoted on to a bar that slides horizontally, or it may be fitted with a pin that will slide within a horizontal slot cut in the frame or in a projection from the frame.

225.—MANUFACTURE OF BRICKS: *M. F. Solow.*—The bricks are composed of finely-pulverised and moulded marl dusted with ground clay, again pressed, and then, having been fired, dipped into a glazing solution and fired again. By another process the glaze and clay are mixed with the marl in the press.

230.—A FLOATING BATH, &c.: *T. Bradley.*—The floating bath, that may be used as a circus, theatre, and so on, is intended to be moored to and to form portion of a floating pier. The central bath is surrounded with water-tight compartments, and is fitted with a movable bottom secured with locking bolts to be worked by the hand. Upon the withdrawal of the bolts the bottom will rise and serve for a floor, which can be lowered by causing water to flow into the compartments which constitute the base of the floor. A side-stage is raised and lowered by similar means. Promenades, rows of seats, and stabling, &c., are ranged around the bath.

246.—AN ELECTRICAL CUT-OUT: *F. Headley.*—In a minimum magnetic cut-out the inventor fits a catch upon the connecting-bridge of the lever that will engage with a latch upon one end of another lever whose other end constitutes the armature of a series electro-magnet. The armature is kept out of the way with a spring, but will spring out to release the catch in the event of the current falling below minimum strength, whereupon the circuit-breaker is operated with another spring. For a maximum cut-out it is contrived that the catch shall be retained when the armature is away from the core, the catch being released through the attraction of the armature by the strength of the current.

286.—AN APPLIANCE FOR CRANES: *W. L. Spence.*—In the base of the crane roller chains that travel between skates and the rails are substituted for the ordinary wheels, a ratchet serves for the traversing motion, and a chain may also be employed for driving the winding-barrel.

316.—THE MOULDING OF BRICKS: *J. L. Vandenhovel.*—An endless chain turns an annular channel-iron frame which carries the moulds and is joined with eye-bolts or spokes to a hub, rollers upon cam rails carry forked pressing-plungers and the mould-table runs upon circular rails, provision is made for the automatic turning up and down of the pivoted covers of the moulds which remain closed during the operation of pressing, by means

of rollers—adapted for running upon a fixed cam rail—which carry vertical sliding-ridges at whose upper ends are slotted arms which impinge upon the belt-crank levers on to which the covers are hinged, whilst rollers upon the cover tops press against circular plates beneath a radial beam.

320.—PLATES FOR ROOFING PURPOSES: W. Martin.—For cutting roofing-plates and clipping their corners before the plates are tinned. The feed-roller and a presser-roller of the machine feed the sheet or plate with an intermittent pressure, as spring arms worked with sector-shaped adjustable cams operate the presser-roller; a reciprocating bar carries the knives, and whilst the blank is being cut it is held up with automatically-moved pivoted arms that will again be opened outwards for the falling of the sheet.

MEETINGS.

FRIDAY, MAY 3.

Architectural Association Discussion Section.—Mr. E. Greenop on "The Ethics of Professional Advertising," 7 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—The Northcott prize paper on "How may the best efforts of Employer and Employed be exerted for their mutual advantage and for the National Benefit?" by Mr. William Powrie, will be read and discussed, 8 p.m.

Society of Arts (Howard Lectures).—Mr. Alfred C. Eborall on "Polyphase Electric Working," II. 8 p.m.

SATURDAY, MAY 4.

Architectural Association.—Visit to Newgate Gaol, 3 p.m.

British Institute of Certified Carpenters.—Mr. W. J. Collins on "Trades Training in the Future," 8 p.m.

Edinburgh Architectural Association.—Geological ramble in Queen's Park.

MONDAY, MAY 6.

Royal Institute of British Architects.—Annual general meeting, 8 p.m.

Society of Arts (Cantor Lectures).—Sir W. Chandler Roberts-Austen and Mr. T. Kirke Rose, D.Sc., on "Alloys," III. 8 p.m.

Society of Engineers.—Mr. T. B. Grierson on "The Treatment of Low-Grade Iron Ores for the Smelting Furnace," 7.30 p.m.

Liverpool Architectural Society.—Annual general meeting, (1) Annual Report of Council and Financial Statement; (2) Election of Officers and Council for the Fifty-fourth Session; (3) Closing Address by the President, Professor F. M. Simpson, 6 p.m.

WEDNESDAY, MAY 8.

Institute of Sanitary Engineers.—General Purposes and Finance Committee at 7 p.m. Election Committee at 5.15 p.m. Council Meeting at 7 p.m.

THURSDAY, MAY 9.

Carpenters' Hall, London Wall (Lectures on Carpentery and Joinery).—Mr. S. Barber on "The Joiney of a Room," 7.30 p.m.

Institution of Electrical Engineers.—Mr. J. S. Highfield on "Storage Batteries in Electric Power Stations, Controlled by Reversible Boosters," 8 p.m.

FRIDAY, MAY 10.

Architectural Association.—(1) Mr. Alfred Hands, F.R.M.S., on "The Protection of Buildings from Lightning" (Illustrated by lantern views); (2) Election of officers, 7.30 p.m.

Society of Arts (Howard Lectures).—Mr. Alfred C. Eborall on "Polyphase Electric Working," III. 8 p.m.

SATURDAY, MAY 11.

Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilization in Egypt," I. 3 p.m.

Northern Architectural Association.—Visit to Collingwood-street and Quayside Buildings, Newcastle, 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Table listing property sales with columns for date, location, and price. Includes entries like 'April 18.—By MILLER & ABBOTTS (at Banbury)... £3,549' and 'April 19.—By C. W. DAVIES & SON... 1,290'.

Table listing property sales with columns for location, agent, and price. Includes entries like 'By W. W. READ & CO. Hackney.—55, Eleanor-rd., ut. 44 yrs., g.r. nil, r. 32d. £295' and 'By BRADSHAW BROWN & CO. Limehouse.—111 and 113, Narrow-st., ut. 93 1/2 yrs., r. 120d. and 122 yrs., g.r. 10d. £350'.

Table listing property sales with columns for location, agent, and price. Includes entries like 'By EDWIN EVANS. Regent's Park.—Cumberland-market, &c., i.g.r. 17 1/2, ut. 24 yrs., g.r. 5d. 10s. 210' and 'By FAREBROTHER, ELLIS, & CO. Whatfield, &c., Suffolk.—Furzeaux Farm, 241 a. r. 16 p. f. 1,700'.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Fire Station, &c.	Manchester Corporation	300L, 200L and 100L	July 31

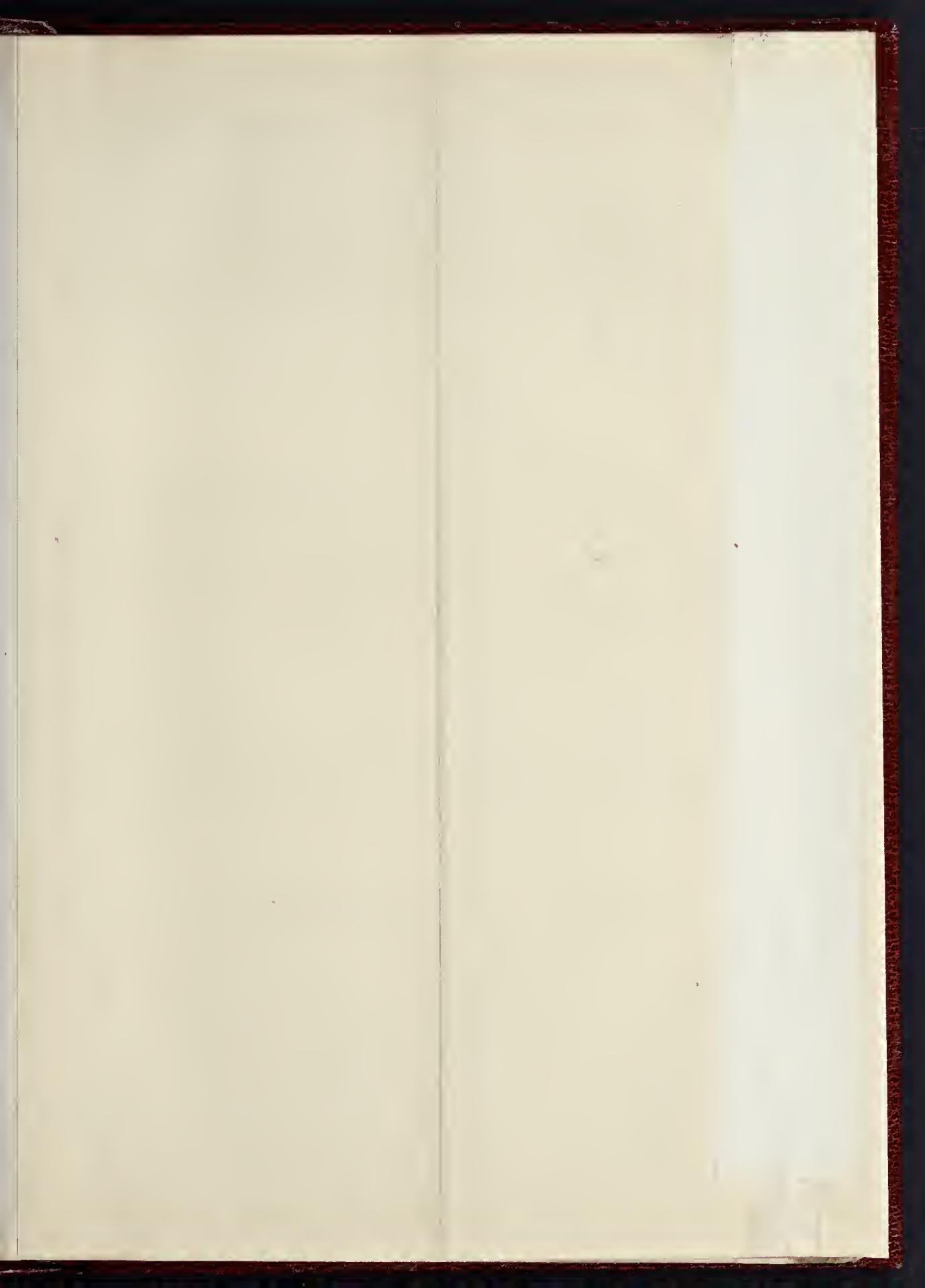
CONTRACTS.

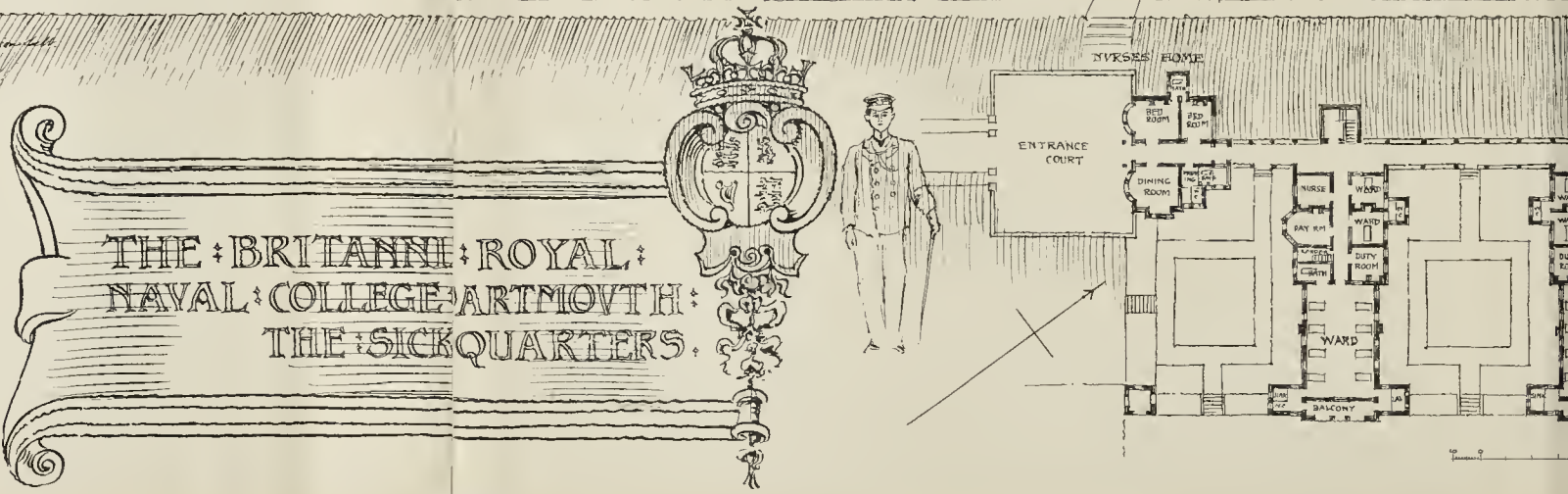
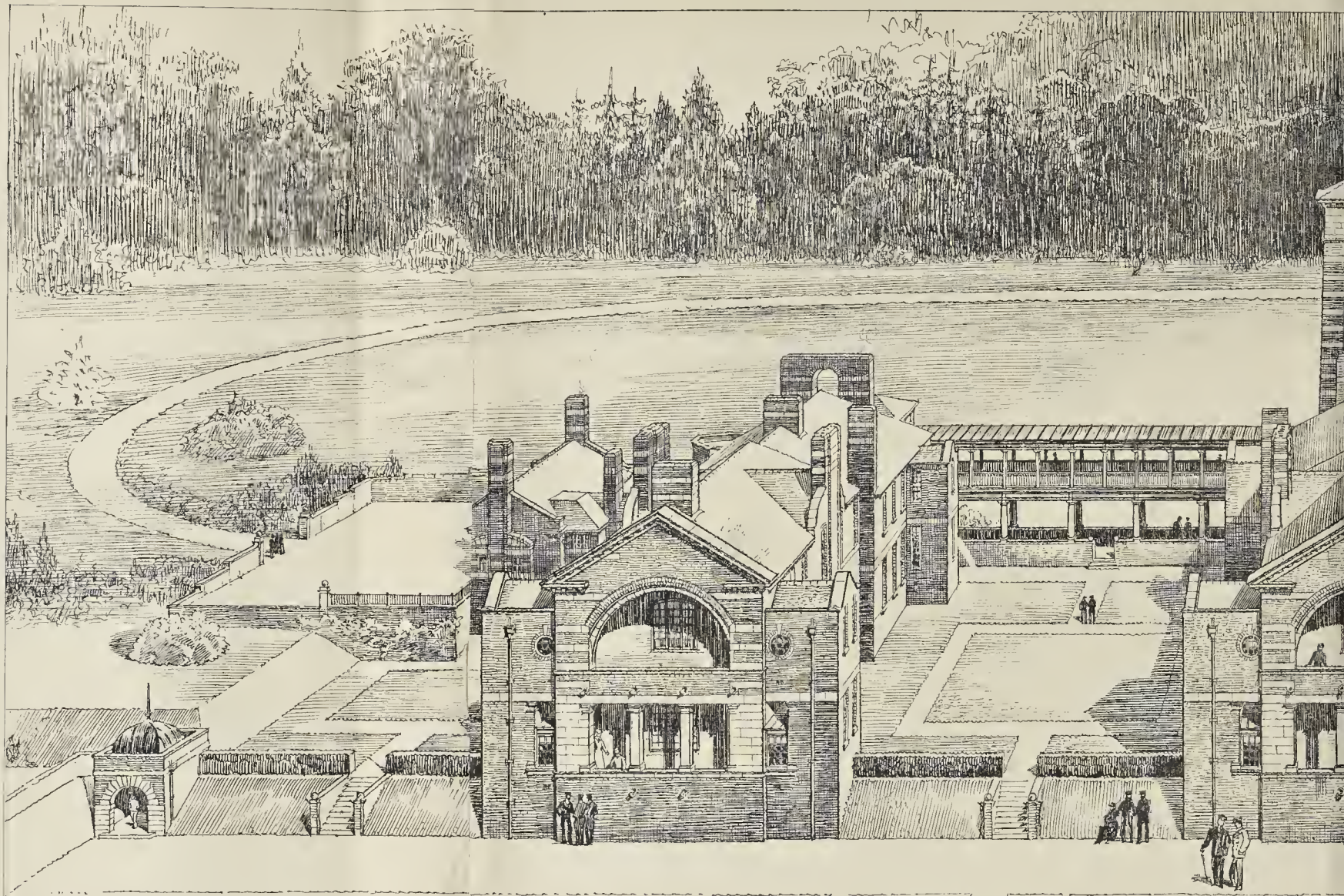
Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Tramway Depot, near Trent Bridge	Nottingham City Council	A. Brown, Civil Engineer, Guildhall, Nottingham	May 6
Bridge at the Dale, Alnstable	Penrith R.D.C.	S. Hill, Architect, Redruth	do.
Farmhouse, Langarth, near Truro		W. D. Morgan, Architect, 5, Bailey-street, Ton Pentre, R.S.O.	do.
Chapel, Gell, Rhondda Valley, Wales		W. Marshall, Hatfield Park, Hatfield	do.
House, Hatfield, Herts		G. W. Salkeld, High-street, Langley Moor	do.
Alterations to Club Premises, Langley Moor, Durham		A. Latch, Engineer, 40, St. Enoch-square, Glasgow	do.
Grand Stand, &c., Bramall-lane	Sheffield Cricket, &c., Club, Ltd.	H. Winkworth, Architect, 8A, Hatton-court, Ipswich	May 7
Chapel, Orford, Suffolk	Hereford Dwellings Company, Ltd.	G. H. Godsall, Architect, Palace Chambers, Hereford	do.
Cottages, Edgar-street		J. Barton & Son, Architects, Dewsbury	do.
Engineering Works, Birstall, Yorks	Lanes & Yorks Railway Company	R. G. Irwin, Bunts Bank, Manchester	do.
Mill, &c., Miles Platting, Manchester	Cumberland County Council	G. Dale Oliver, County Architect	do.
Farm Buildings, Newton Rigg, Penrith	Aberdare Co-op. Society, Ltd.	J. L. Smith & Davies, Architects, Aberdare	do.
Three Houses	Strabane (Ireland) Union R.D.C.	J. E. Sharkle, Council Offices, Strabane	do.
Several Cottages		Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Alterations to Brewery, &c., Rhymney, Wales	Cruden (Aberdeen) School Board	T. R. Saunders, Engineer, Belgrave Chambers, Ventnor, I.W.	May 8
Additions to Schools, Fort Errol	Randown (I.W.) Pier Extension Co.	J. H. Brerley, Surveyor, Town Hall, Richmond	do.
Pier Works	Richmond Corporation	F. Croft, Architect, Victoria Chambers, Grimsby	do.
Technical Institute, Cleethorpes		C. C. Doig, Architect, Elgin	do.
Business Premises, Lissie Wynn, Eight		R. W. Dixon, Architect, 8, Eastgate, Barnsley	do.
Three Shops and Houses, Ormeau, near Barnsley	Primitive Methodist Trustees	Oriffiths & Jones, Architects, Tonypandy	do.
Additions to Chapel, Llywynpia, Wales	Isle of Thanet Union Guardians	L. Grant, Architect, High-street, Sittingbourne	do.
Alterations at Workhouse, Minster	Park Cottage Company, Ltd.	Morgan & Elford, Architects, Mountain Ash	do.
Thirty Cottages, Mountain Ash, Glam	Lindfield (Sussex) School Board	J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Wood Ceiling at Baptist Chapel, Oolecar	Dr. J. R. Armstrong	E. Waugh, Bolton-road, Hayward's Heath	May 9
Additions to Schools	Stafford R.D.C.	W. D. Morgan, Architect, 25, St. Mary-street, Cardiff	do.
Residence, Surgery, &c., Treorchy, South Wales	Rawtenstall Corporation	W. Morgan, 4, Martin-street, Stafford	do.
Granite Road Metal		A. W. Lawson, Civil Engineer, Municipal Offices, Rawtenstall	do.
Cart Sheds, &c., Burnley-road	Sunderland R.D.C.	J. F. Walsh & Nicolas, Archts., L. & Y. Bank Chmbrs., Halifax	May 10
Villa, Lower Wyke, Bradford	L. & N.W. & G.W.E. Companies	T. Young, Surveyor, Council Offices, Sunderland	do.
Whinstone Road Metal		A. E. Bolter, Paddington Station, London	do.
Steel Orders (500 tons)	Mr. H. G. Smith	Wilcox & Raikes, Civil Engineers, 63, Temple-row, Birmingham	do.
Water Supply Works, Baddesley Ensor, Atherstone	Salford Corporation	J. Parkinson, Architect, 67, Church-street, Lancaster	do.
House, near Bay Horse Station, Lancaster	Salop County Council	L. C. Evans, Town Hall, Salford	do.
Reservoir Works, Highfield	Rev. W. Kane	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury	do.
Additions to Police Station, Oswestry	Rev. H. Williams	M. A. Robinson, Architect, Richmond-street, Londonderry	May 11
House, Broughton, Ireland	Uxbridge Burial Board	E. M. E. Vaughan, Architect, Cardiff	do.
Church, Newton, Aylmermouth, Wales		W. L. Eves, Architect, 54, High-street, Uxbridge	do.
Wall, &c., Kingston-lane		O. Caldwell, Architect, Penzance	do.
Art School, Falmouth	East Grinstead U.D.C.	S. Hill, Architect, Redruth	May 13
Vestry, &c., Wesleyan Chapel, St. Agnes, Cornwall	Armagh District Committee	R. Wilds, Surveyor, Council Offices, East Grinstead	do.
Eighteen Workmen's Dwellings	Huddley (Lancs) U.D.C.	Doran, County Surveyor, Court House, Armagh	do.
Water Supply Works, Gillis-row		A. Holden, Civil Engineer, Cross-street, Hindley	do.
Street Works	Newport (Salop) U.D.C.	W. Swift, Architect, 4, Princes-street, Truro	do.
Business Premises, Porhan-lane, Falmouth	Abingdon School Board	F. E. N. Haswell, Architect, 77, Tyne-street, North Shields	do.
Church School, Rowlands Gill	Esher and The Ditions U.D.C.	W. Wyatt, Engineer, 39, Radford-road, Leamington	do.
Sewerage Works	Wandsworth and Clapham Union	W. L. Eves, Architect, 54, High-street, Uxbridge	May 14
*School Buildings	Chapel-en-le-Frith R.D.C.	Engineer, Council Offices, Portsmouth-road, Thames Ditton	do.
*Cottages	Hendon Guardians	Lansdell & Harrison, Architects, 38, Bow-lane, Cheap-side, E.C.	May 15
*Extension of Board Room, &c.	Luton Guardians	Sterling & Swann, Civil Engineers, Town Hall, Chapel-en-le-Frith	do.
*Water Supply Works	Norwich Corporation	H. T. Hare, Architect, 13, Hart-street, Bloomsbury, W.C.	do.
*Alterations, &c., to Laundry	Hornsey U.D.C.	do.	do.
*Machinery, Boilers, &c.	East Ham School Board	B. B. Franklin, Architect, 21, Market-hill, Luton	May 18
Homestead, Dunstable-road	Leeds Corporation	A. E. Collins, Civil Engineer, Guildhall, Norwich	do.
Street Works, Olousters-street, &c.	Walthamstow Parochial Charities	Engineer, Council Offices, Southwood-lane, Highgate, N.	May 20
*Electric Lighting Station		Clerk, School Board Offices, East Ham, E.	do.
*Furniture	Newcastle Corporation	See Advertisement	May 22
*Market Hall, &c.	Exors. of the late J. T. Newbold	W. A. Longmore, Bridge-chambers, Hoe-street, Walthamstow	May 23
*Shops and Office Premises		F. R. Brown, 5, Henry-street, Rotherham	No date
Church Works, Rotherham		Burton & Percival, Archts., 180A, Stamford-st., Ashton-under-Lyne	do.
Underground Conveyance, Ashton-under-Lyne		A. E. Le Rossignol, Engineer, Pandon Buildings, Newcastle	do.
Alterations, &c. to Car Sheds, Haymarket and Gosforth		J. L. Donnelly, Architect, 24, High-street, Omagh	do.
Two Shops, Stanley-street, Bury, Lancs		W. H. D. Horsfall, Architect, Tower Chambers, Halifax	do.
House, Fintona, Ireland		S. Land, Treston, Yorks	do.
Alterations to the "New Tyn" Sowerby Bridge		A. J. Lacey, Architect, 6, Upper St. Andrew-street, Norwich	do.
Three Houses, Treston, Yorks	Newbury Town Council	S. J. L. Vincent, Borough Surveyor, Town Hall, Newbury	do.
Additions to National Schools, Old Newton, Suffolk			do.
Road Metal			do.

PUBLIC APPOINTMENTS.

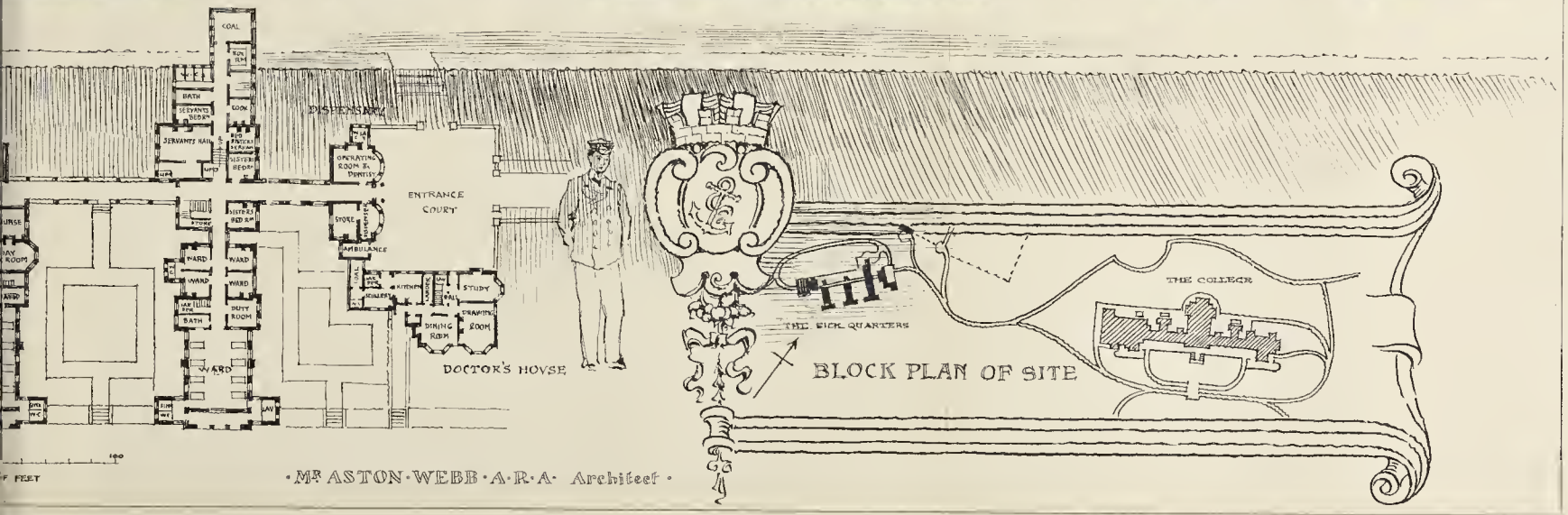
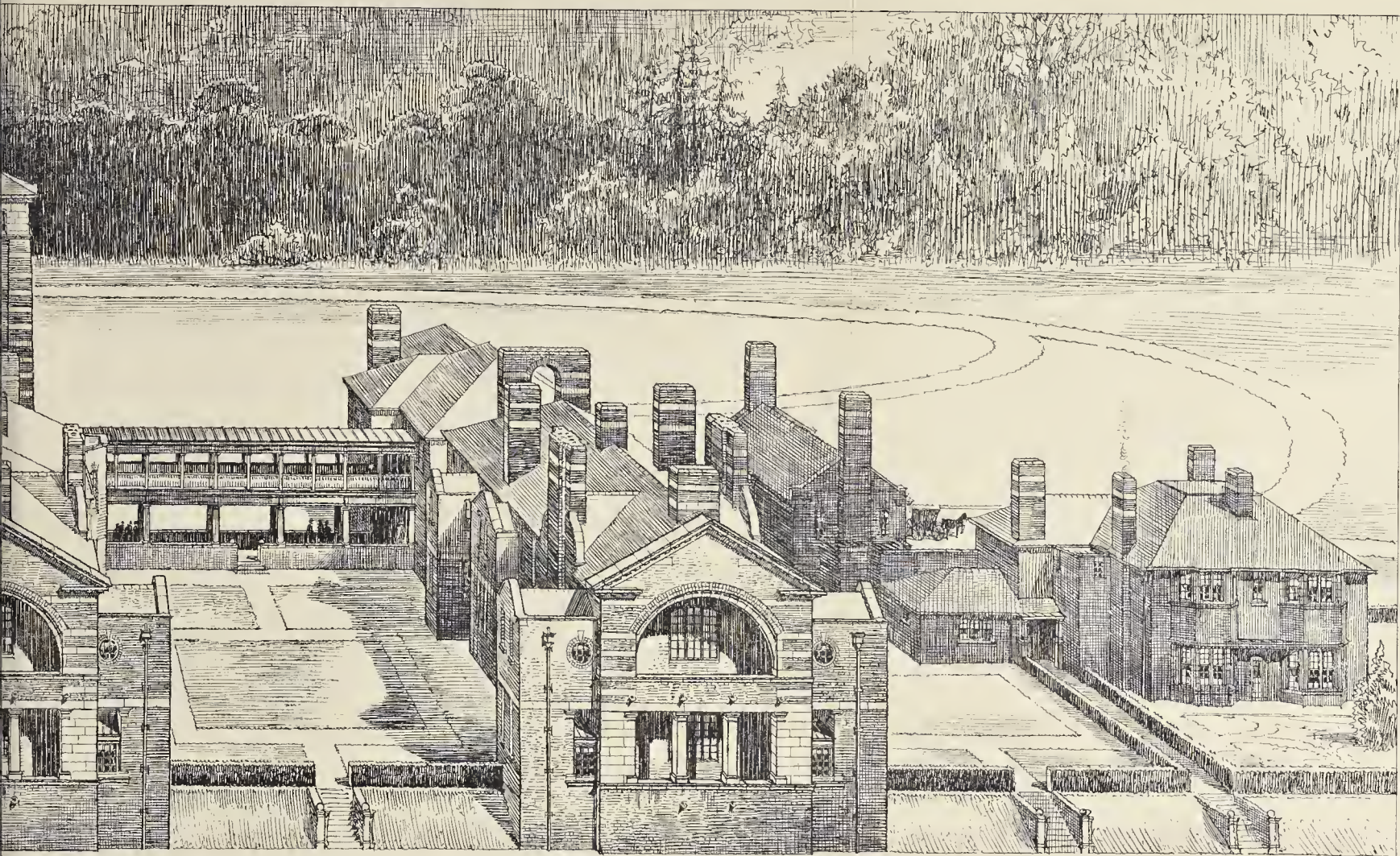
Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Cannock U.D.C.	3 Guineas per week	May 10
*Architectural Draughtsman	Plymouth Corporation	100L per annum	May 18
*District Road Surveyors (Four)	Nottingham Corporation	175L per annum	do.
*Borough Engineer and Surveyor	Hampstead Borough Council	600L per annum	May 20
*General Superintendent of Roadworks		200L per annum	do.
*Draughtsman	Middlesbrough Corporation		May 22
*County Surveyor	Breconshire County Council	250L per annum	June 1

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xx. Public Appointments, pp. xviii. & xx.



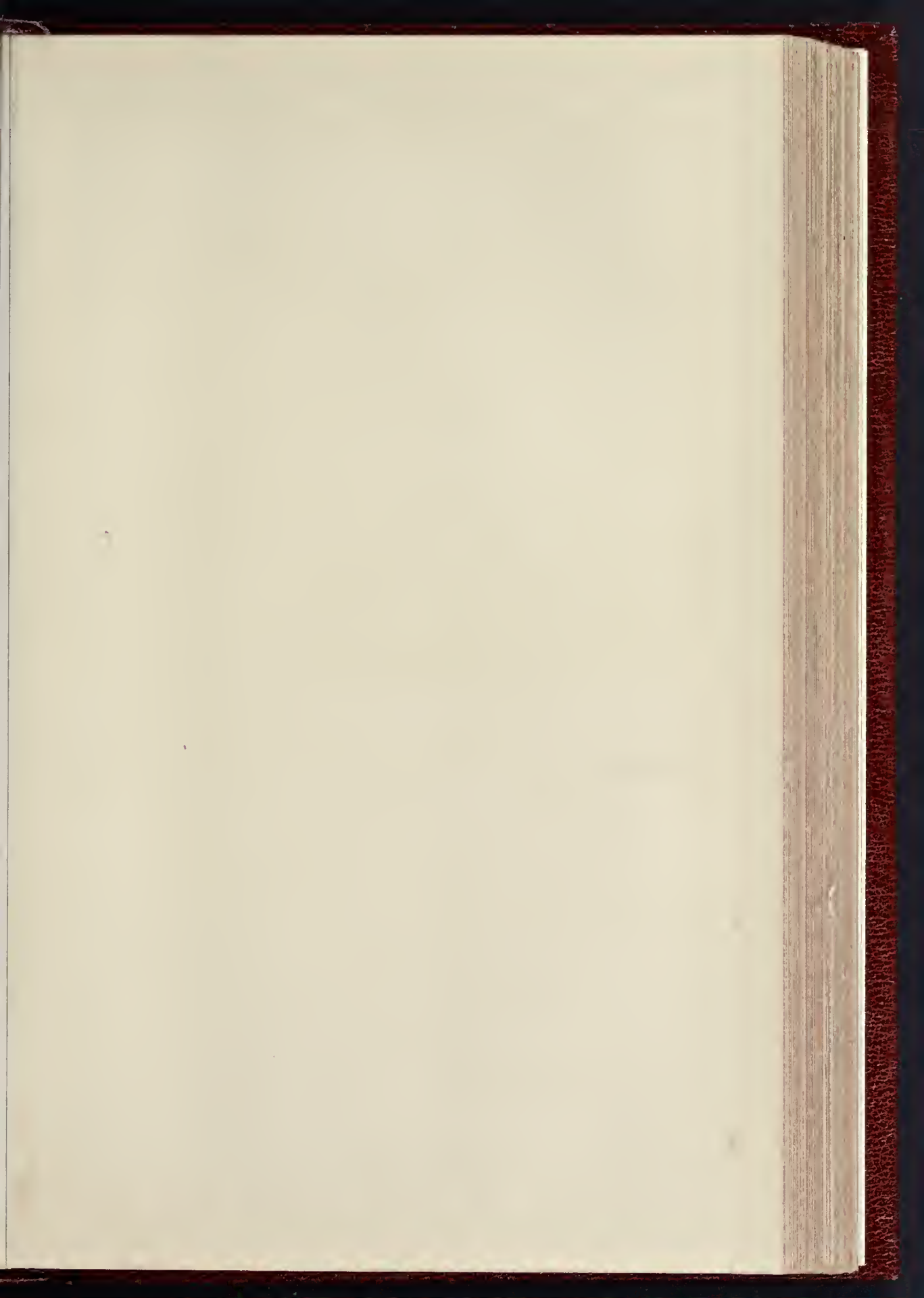


THE BRITANNIA ROYAL
 NAVAL COLLEGE ARTMOUTH
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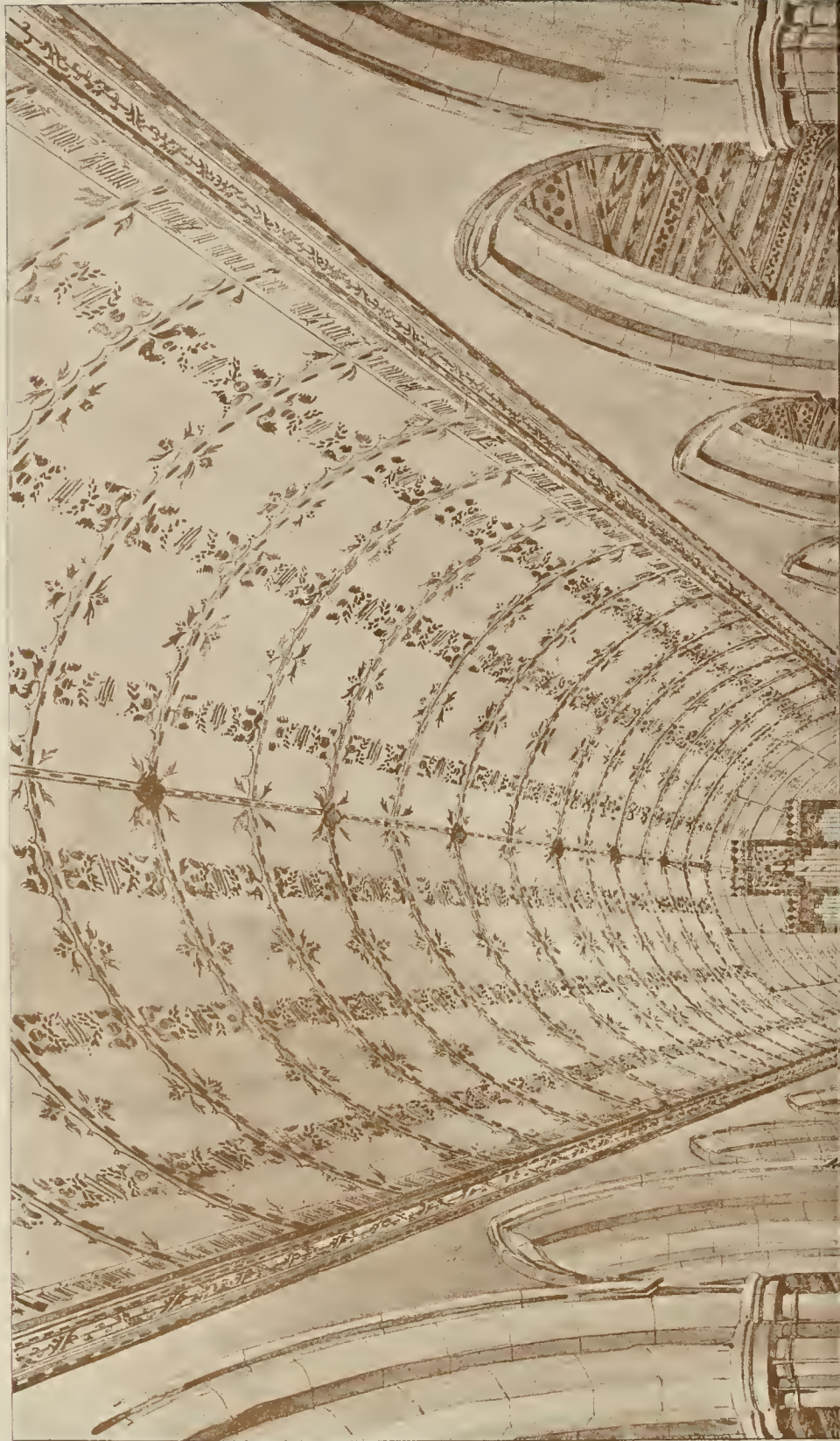


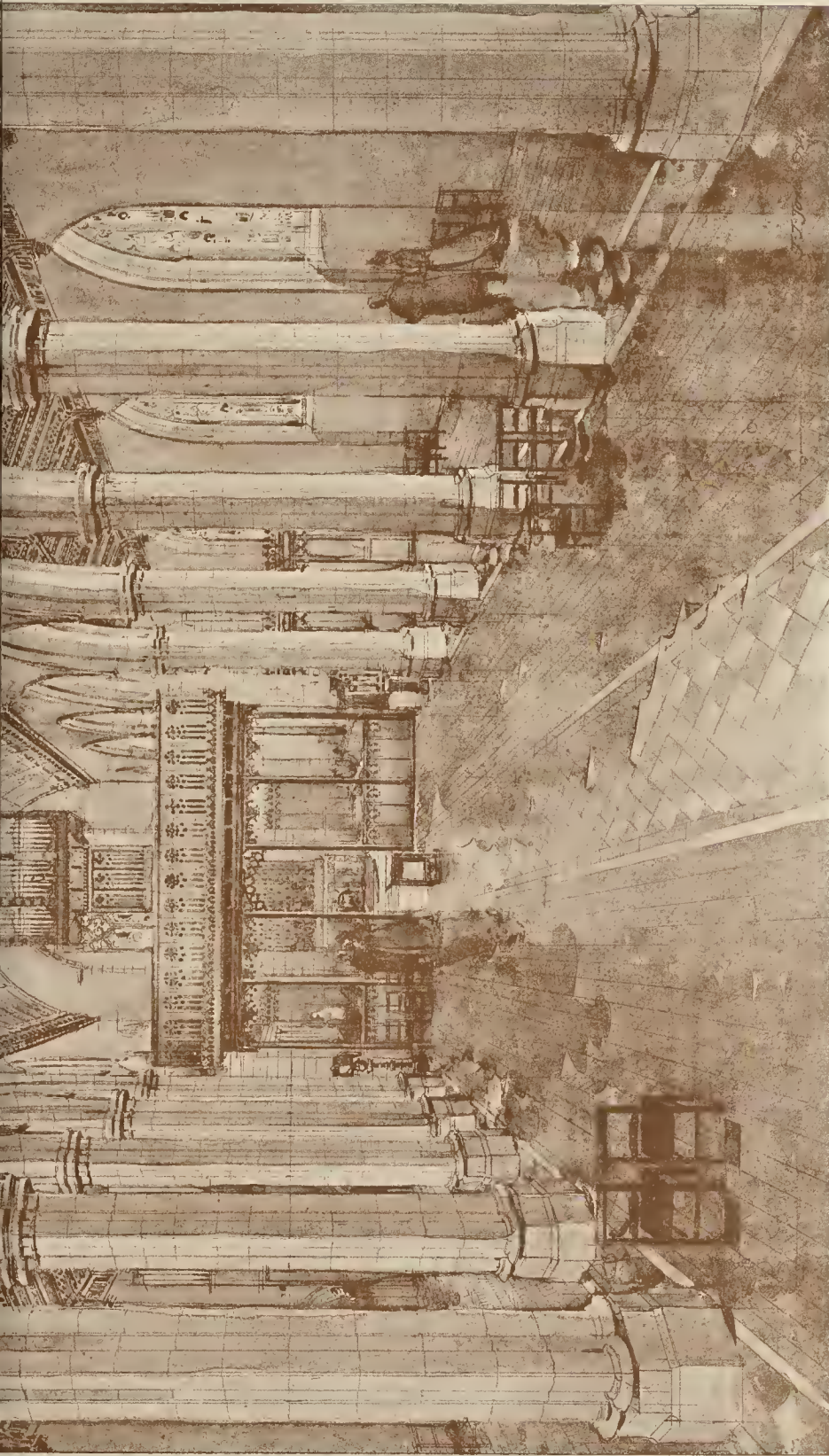
• M^r ASTON WEBB • A. R. A. • Architect •





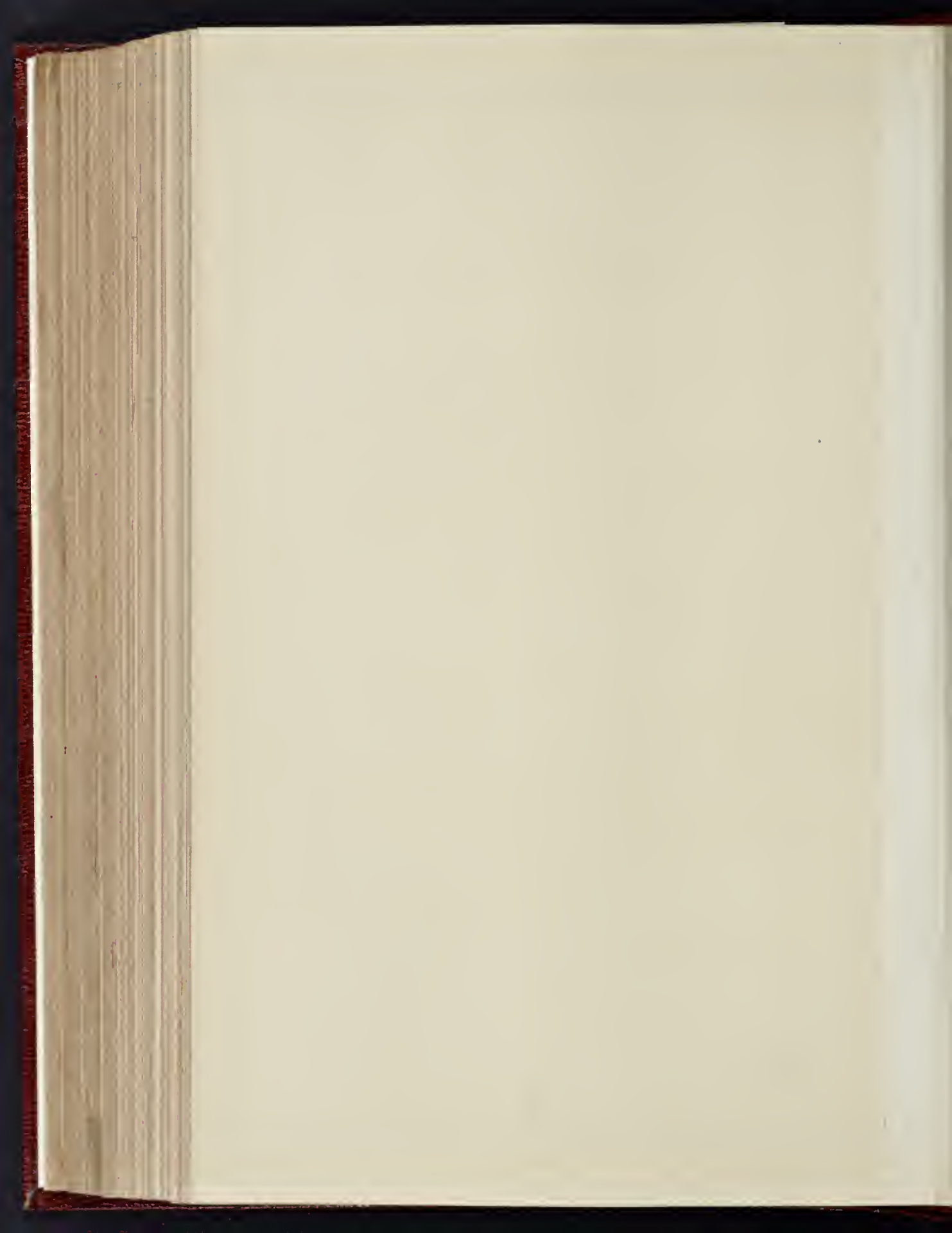
THE BUILDER MAY 4, 1901





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PRICES CURRENT OF MATERIALS.

* * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest quality and quantity obviously affect prices—a fact which could be remembered by those who make use of this information.

Table listing various materials like Hard Stocks, Grizzles, Shipping, etc. with prices in £ s. d. and per 1000 or per ton.

NOTE.—The cement and lime is exclusive of the ordinary charge for bags.

STONE.

Table listing stone materials like Ancaster in blocks, Bath, Portland Cement, etc. with prices.

SLATES.

Table listing slate materials like 20x10 best blue Bangor, 16x8 best blue Portman, etc.

TILES.

Table listing tile materials like Best plain red roofing tiles, Best Broseley tiles, etc.

WOOD.

BUILDING WOOD.—YELLOW.

Table listing yellow building wood materials like Deals: best 3in by 11in, Battens: best 2 1/2 by 6, etc.

PRICES CURRENT (Continued).

WOOD.

Table listing various wood materials like Fir timber, Pine, Joists, Girders, Rolled Steel Joists, etc. with prices.

JOISTS, GIRDERS, &c.

Table listing joists and girders materials like Rolled Steel Joists, Compound Girders, etc.

METALS.

Table listing metal materials like Iron—Common Bars, Sheet Iron, Galvanised, etc.

PRICES CURRENT (

METALS.

Table listing metal materials like Brass—Strong Sheet, Tin—English Ingots, Solder—Plumbers, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing English sheet glass materials like 15 oz. thirds, 21 oz. thirds, etc.

OILS, &c.

Table listing oil materials like Raw Linseed Oil in pipes, Turpentine, etc.

VARNISHES, &c.

Table listing varnish materials like Fine Elastic Copal Varnish, Best Hard Copal Varnish, etc.

TO CORRESPONDENTS.

E. L. (Next week). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

TENDERS.

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

Table listing tender information for Aberdeen, including contractors like Pringle & Glessor, Plastering—Stephen & Sons, etc.

[See also next page.]

AYTHORP ROOTHING (Essex).—For a pair of cottages. Mr. R. Mawhood, architect :—
E. Hockley..... £395 | F. Harman, Dunmow* £320
T. Harris..... 350

BARROW-IN-FURNESS.—For the erection of school buildings, Vickerstown, for the School Board. Mr. H. T. Fowler, architect, Ramsden-square, Barrow-in-Furness. Quantities by the architect :—

<i>Excavating, Drainage, Bricklaying, and Joinery.</i>	
Clarke & Robinson, Barrow*	£5,532 0 0
<i>Stonemasonry.</i>	
George Varley, Barrow*	745 5 0
<i>Plumbing, Glazing, and Painting.</i>	
James Gell, Barrow*	605 11 2
<i>Slating and Plastering.</i>	
James Walker, Barrow*	825 0 0
<i>Smith and Heating Apparatus.</i>	
Wm. Barrett, Barrow*	565 18 6
Total	£8,073 14 8

CHELMSFORD.—For five villas on the Broomfield-road. Mr. R. Mawhood, architect, Chelmsford :—

EACH.	
F. Johnson	£797
Moss & Co.	750
F. Weight, Chelmsford*	745

GATESHEAD.—For the erection of school buildings, Kelvin-grove, for the School Board. Mr. J. Landell-Nicholson, architect, 55, Northumberland-street, Newcastle. Quantities by Mr. George Bell, Newcastle :—

W. C. Tyrie .. £12,106 5 8	Thos. George .. £11,236 14 0
S. Sheriff .. 12,005 18 1	J. Elliott .. 10,670 0 0
T. & R. Lamb .. 11,856 7 7	W. Foster .. 10,459 0 0
T. Weatheritt .. 11,694 5 11	Thos. Hunter, Washington* .. 9,959 10 0
J. C. Hope .. 11,662 11 8	
J. Bewley .. 11,265 6 10	

GLOUCESTER.—For the erection of Primitive Methodist church and schools, Stroud-road. Mr. Harry A. Dancy, architect and quantity surveyor, 26, Clarence-street, Gloucester :—

A. J. Dolman .. £2,022 0 0	J. Simmonds .. £1,880 0 0
W. Jones .. 1,932 0 0	T. J. Williams .. 1,866 0 0
Gurney & Sons .. 1,623 3 8	W. T. Nicholls .. 1,854 14 0
Halls Bros. .. 1,906 0 0	W. Byard* .. 1,854 0 0
	[All of Gloucester.]

LEICESTER.—For extension of the Leicester Infirmary, Messrs. Everard & Pick, architects, Leicester :—
Clark & Garrett .. £11,130 | T. Herbert .. £10,679
Hutchinson & Son .. 10,989 | Moss & Sons .. 10,300
Johnson & Sons .. 10,880 | Herbert & Sons .. 10,497
H. Bland .. 10,757

LITTLE WALTHAM.—For additions to Cranham Lodge. Mr. R. Mawhood, architect :—
G. Holland, Gt. Leighs, Essex* .. £650

LONDON.—For the erection of shops at East Ham, London, E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—
Sheffield Bros.* .. £3,120

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LONDON.—For work at the Neville Arms, Stoke Newington, London, N. Messrs. Foulsham and Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. :—
T. J. Dartnell .. £302 | J. T. Robey* .. £293 0
C. Chapman .. 295 0

LONDON.—For terrazzo paving, St. Pancras Baths, &c., for the Borough Council of St. Pancras. Messrs. T. W. Aldwinckle & Son, architects :—

J. & H. Paterson	1st quality ..	£1,952 0 0
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Simpson & Co.	1st quality ..	1,447 10 7
Carter, Johnson, & Co.	" ..	1,390 0 0
Mosaic Manufacturing Company	" ..	1,350 5 9
Ditto.	2nd quality ..	1,258 18 3
Westminster Patent Flooring Company	Imperial ..	1,306 0 0
Ditto.	Ordinary ..	1,245 0 0
Ditto.	Granito ..	1,195 0 0
Mainzer & Co., Arrolithic Patent	1st quality ..	1,346 0 0
Ditto.	2nd quality ..	1,258 0 0
Mainzer & Co., Ordinary Terrazzo	1st quality ..	1,258 4 0
Ditto.	2nd quality ..	1,170 0 0
Diespeker & Co.*	1st quality ..	1,322 15 4
Do. screeding done by own men	" ..	1,289 6 0
Ditto.	2nd quality ..	1,214 3 0
Do. screeding done by own men	" ..	1,170 10 8

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The Builder.

VOL. LXXX.—No. 3980.

MAY 11, 1901.

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Joint Terminal Railway Station, Howrah, Calcutta.—Mr. Halsey Ricardo, Architect	Extra Large-Page Ink Litho.
North London Crematorium, Finchley-road.—Messrs. Ernest George & Yeates, Architects	Double-Page Ink Photo.
Competition Design for Glasgow Royal Infirmary.—By Mr. J. Hessel Tiltman, F.R.I.B.A.	Two Double-Page Photo-Lithos.

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Architecture at the Paris Salon.



HE present year starts a new epoch for the Paris Salons, for having been driven about, for several years back, from one position to another, since the

commencement of the preparations for the 1900 Exhibition, they have now at last got into a building which is to be their permanent home for many years to come, viz., the Grand Palais de l'Art which was erected in connexion with the Exhibition in the first instance, but also as a permanent art-gallery for the future. The building seems almost to have been designed with a view to providing for the separation of the two Salons, the Old and New; since the plan, as described last year, consists of two main divisions, differently arranged and treated, but connected internally. The larger division of the plan, next the gardens, consists of a block of building in this shape with a grand double staircase in the shank opposite the main entrance; this has two stories of galleries surrounding a great central court roofed with glass. The other division forms a long block joining on to the shank, and nearly but not quite parallel to the larger block, the line of its outer façade being governed by the line of the Avenue d'Antin, to which it faces. In this block there is a circular central hall and dome, with staircases ascending to right and left parallel with the long elevation; and in this block, which is the smaller but architecturally the more effectively arranged of the two, the new Salon has its abode, the larger block, with nearly the whole of the central court, being occupied by the Old Salon. The amicable arrangement by which, at the Galerie des Machines, one entrance fee admitted to both Salons, has been abandoned; there are separate entrances, and a "wicket" between the two Salons, which cannot be passed in either direction without payment. The arrangement is not convenient, nor is it the best in the interests of the two exhibitions.

In our title we have only named "the

Paris Salon" in the singular number, for at the New Salon there is this year no architectural department worth mention, the exhibits being confined to a few specimens of furniture designed by architects. At the Old Salon the upper story of galleries is devoted to paintings, the ground stories to engravings, drawings, and architecture, the latter occupying one-half the ground-floor space, so that it is provided for in a better and more dignified manner than at the Palais de l'Industrie, where it had only two rooms and the gallery round the central court, into which no one ever went. It cannot be said that the present architectural galleries are very much frequented, but they are part of the main suite, at all events.

As usual, the leading exhibit of the year is one of those collections of classic restoration drawings on an immense scale, which come from the Villa Medici. This is M. Tournaire's "Delphi"—drawings of the actual state of the ruins, and a complete restoration of the whole site. As to the disposition of the temples and shrines, the *état actuel* gives more data than is the case with many of these restorations. The restored elevation shows a crowd of temples, shrines, treasure-houses, &c., rising up the hill and flanking the Sacred Way, and at the top the long side façade of the Doric temple, with an ugly break cut out of its line of roof for a hypethral opening, with an effect which seems in itself the best argument against this theory of the mode of lighting a Greek temple; the Greek architectural eye would surely never have put up with that. Towards the right of the mass of buildings is a colossal nude statue of Apollo. There are two exceedingly good drawings of two of the recovered bronze statues in their actual state, and a drawing of a curious column, for which we are not given the data, in which the fluting is interrupted at regular intervals by a growth of acanthus leaves. If this is a true detail, based on facts, it adds to the other evidence, which crops up from time to time, that Greek architectural design was not so devoid of varieties and even eccentricities as we are in the habit of supposing.

Besides the usual classic restoration scheme from Rome, we have also the usual ultra-sublime conceptions of the students of the Ecole des Beaux-Arts at home, who are given an abstract idea to put into architectural

form, without apparently the slightest limiting condition as to size, cost, or practicability of execution. This year the subject is "Monument aux Héros de l'Indépendance," and the design made by M. Ferret and M. André Collin for this (numbered 3,801 in the catalogue) contains some really fine ideas in architectural treatment, the whole spoiled and the scale reduced by the enormous colossal figure cut in the rock above it. There are two or three other drawings by competitors in the same subject, which are simply preposterous, and represent things which, in a practical and economic sense, could never possibly be built. Is it any real benefit to architectural students to be encouraged to do this kind of thing? It is so easy to be sublime (on paper) when you are left without any limits as to size or cost; it would surely be better if students were either given the limit of size of the site, or a limit of proposed cost. It would be much better practice for them to see what effect they could produce within that limit, than to draw out these architectural nightmares.

Apart from these, there is rather more representation of current architecture actually carried out, or to be carried out, than we usually find among the Salon exhibits. Among these is the new Hôtel de Ville of Versailles, by M. Le Grand, illustrated in a fine set of drawings. It presents the usual general type of a French suburban hôtel de ville, with high roofs and a flèche or spirelet on the ridge, and triple entrance doors in the centre of the ground story; but it has a character of its own, produced partly by the bold projection of the two ends of the façade, partly by the breadth of treatment of the upper story with its coupled rusticated columns and mullioned windows between; in the photograph from the actual building it looks even better than in the drawings. M. Doré exhibits the drawings of his Hôtel de Ville for Lens, a building of considerable originality, in a very free Renaissance style; the principal story shows large square-headed windows with a carved enrichment worked along the top and half-way down the jambs, the rest plain—a piquant effect. Above these windows is a very boldly-carved frieze in high relief, of figures and scrolls combined.

Two of the best, perhaps the best, exhibits of recently executed work are shown by M. Hermant; the Caserne des Célestins,

Boulevard Henri IV., and the houses forming Nos. 132 and 134 in Rue Réaumur. The caserne is a military barracks in three blocks separated by a space and entrance gates; in the general design of the blocks there is a certain similarity, but the centre block is kept lower than the side ones, and the outer blocks have a modillion cornice, the centre one a plain cornice. On the other hand, the entrance in the middle of the centre block is the ornamental point of the building, with decorative iron gates of fine design, and sculptured spandrel figures above the arch. This centre portion is shown in a remarkably fine and very large washed detail elevation,* about as fine an example of architectural drawing as one could wish to see. The whole design is an excellent example of interesting treatment given to a practical building, without over-ornamenting it or departing from its true character; the slight variation of design between the outer and the centre blocks gives a good effect of contrast, while the strong rusticated ground story, the same in all three, binds the whole together. The Rue Réaumur buildings form an immense block of apartment houses, with the windows, above the ground story, grouped under lofty arched bays, and enriched with well-designed iron balcony grills; above the entrance a block is carried up as a kind of tower, with bold rusticated treatment and a cupola over; the upper part occupied by a clock face supported by carved figures in low relief. This and the "caserne" are among the class of works in which French architects are seen at their best, where the problem is to give some architectural interest to an essentially utilitarian building.

Among ideal compositions one is shown which is not utopian, and which might very well be carried out with fine effect. This is M. Henry's "Monument à la Concorde," a design for a monumental architectural screen to be erected across the west end of the Tuileries Gardens, and therefore flanking the east side of the Place de la Concorde. It consists mainly of a colonnaded and vaulted loggia, straight at the two ends and parallel to the Place de la Concorde; the centre portion is recessed by means of two quadrant colonnades falling back to a triumphal arch gateway, the axis of which is of course in line with the axis of the fountain in the centre of the Place. This leaves an open space, the centre of which is proposed to be occupied by the monument to "Concorde," a pyramidal sculpture group in bronze. The design is fully illustrated by plan, elevations, and perspective drawings; it is highly creditable to its author, and a design which could be carried out at no abnormal or disproportionate cost; and it would render more complete the fine vista of architectural effect extending in one axis from the Arc de l'Etoile eastward to the court-yard of the Louvre.

In church architecture there is not much of interest shown—there seldom is much of modern church architecture at the Salon, and what there is usually little sympathetic to the English eye. For modern churches the French seem for the present to have settled down to a kind of hard and somewhat clumsy neo-Romanesque, the designs showing generally little charm either of grouping or detail, though there are sometimes new

ideas in planning, as in M. Eschbaecher's "Projet de l'église pour le ville de B—"; but one never knows exactly whether these "projets" are *bona-fide* or not. Among the modern designs for churches the only one which pleased us at all was the competition design for a church at Grenoble by M. Chesnay; this is not a Romanesque but an Italian design, with a campanile at the south-west angle; the exterior is illustrated in a pretty sketch, the interior in a perspective showing a very elaborate scheme of colour decoration, in which the prevailing tone is a little garish; but there is much more refinement of style and detail in this design than in most of the Gothic ones. France was the cradle of Gothic architecture, but the feeling for it has fled from modern France. The best drawings the French architects of to-day produce in connexion with mediæval work are their restorations of half-ruined mediæval structures, which are always admirably drawn. An example is shown in M. Ernest's "Abbaye de Longpont: Essai de Restauration." Apparently the nave remains up to the crown of the aisle vaulting, and part of the east end with the flying buttresses, and sufficient of the transept and west-end walls to offer pretty good data for restoration. The drawings both of the existing remains and the restoration are admirable in completeness and finish.

Among theatrical designs is an Ecole des Beaux-Arts design (as we take it to be) of a "Projet de Théâtre pour une petite Ville," by M. Paul Huillard, which shows how everything is exaggerated in these academical designs; the design is quite beyond and out of keeping with a "petite ville," and looks more as if intended for a principal street in a large city. That we take to be an effect of the competition in the preparation of ideal designs on an enormous scale, already referred to; the Ecole des Beaux-Arts student loses all feeling for simplicity and restraint in architectural design, and cannot design a theatre ostensibly for a small town without trying to give a grandiose effect to it quite out of keeping with the assumed circumstances. M. Gosset exhibits a "Projet de Théâtre populaire," the special object of which seems to be to provide a system of exit doors all round the back of the auditorium, at equal distances. The plan seems a good one enough for the purpose. As far as we observed, there are no plans of actual recently-built theatres exhibited.*

There are some examples of domestic architecture which are of interest to the English visitor, from the special treatment of the plan and arrangement, arising out of French habits of living. Among these is M. Van der Boyen's "Hôtel, Rue de Lota," shown in a nearly complete set of plans, elevations, and sections. This small plan shows three staircases; the first a semi-circular staircase as dignified as the space will allow, from the porte-cochère entrance to the lobby outside the entertaining-rooms, of which the salon occupies the whole front of the plan, and the salle-à-manger most of the side space between it and the courtyard. From this point commences the "escalier de famille," leading to the diminutive bedrooms, &c. The salon,

with its curved and painted ceiling, is evidently, for the size of the house, a most sumptuous room; it is a case in which everything is sacrificed for a spacious appearance in the entertaining rooms. The clever planning of the other rooms, however, and of the servants' stair, is worth attention. The front elevation shows a stone basement with brickwork above and a good deal of colour introduced into it; an unusual treatment in a Parisian house. Among other examples of domestic architecture one of the best is M. Paumier's "Hôtel de M. de B . . . , à Paris." Architecturally this is more in the usual style of the Paris private house, with some nice little points in the detail, such as the suggestion of an Ionic volute in the treatment of the crowning moulding above the windows. There is a good deal that is good in the plan, although we observe on the upper floor the old blunder of French planning, the internal water-closet with no window or ventilation, which French architects seem still unable to part with. M. Dussart's "Une Villa au Bord de la Mer" is a picturesque house with an angle tower with balcony rising from a lofty bastion of masonry; the whole is very picturesque, but it is rather doubtful whether it is not a castle in the air rather than an actual house. M. Degréve's "Habitation de Campagne" is less eccentric than the designs we usually find under this title in the Salon; the lower walls are built of herring-bone brick or tile work with stone angles, the upper portion half-timber. In M. Pottier's "Villa de M. P . . ." we have the "Maison de Campagne" in all its tawdriness of barge-boards run mad, as also in another villa by M. Bernard, capped with enormously projecting roofs, as if it had a bonnet on. This may perhaps have a practical defence as a means of keeping the sun off the walls, but the appearance is very bad.

M. Perronne's plans and model of the "Pavillon de Chirurgie, à l'Asile Clinique" are worth attention, and appear to represent an executed work, though the locality is not stated. Two large rooms with semi-decagon bays form, on the ground plan, the operating rooms, connected with rooms for the sterilisation of instruments, for anaesthesia, &c.; situated between them is the surgeons' room, with a bathroom opening out of it. The whole building is very carefully and practically planned.

In connexion with the recent exhibition we have M. Louvet's drawings of the Palais des Beaux-Arts, and M. Formigé's studies for the admirable Roumanian pavilion, including a very fine coloured detail elevation. This was one of the best designed pavilions in the great Exhibition. Then there are two models which are worth attention. One is that of a funeral monument to a poet, whose initial only is given; it consists of a stele bearing the bronze bust of the poet, on a capital of rather Byzantine type; a nude female figure is prostrated at the base, clasping the stele in an attitude of grief. It is this figure, full of expression, which gives the real value to the design. The other model is also sepulchral; it is that of a mausoleum of a private family, and takes the form of a kind of apse, in horse-shoe shape both in section and plan; in the centre of the floor is a sculptural group, and floor and wall are decorated with conventional foliage designs, probably in-

* As those of our readers will know who have been in the habit of visiting the Salon, it is impossible to find the whereabouts of anything from the arrangement of the catalogue.

tended to be executed in mosaic. M. Narjoux's "Château de Chambeau—Construction et Restauration," does not show in what the "restoration" consists nor how far it is carried; but this is a beautiful set of drawings of a house in château style, very effective in grouping, and very quiet and refined in general character. M. Tailless' design for an "Auberge-relais" (a posting-inn), apparently a "projet" only, is picturesque and original, with its large arch opening into the courtyard and decorated with sculpture suitable to the occasion; this portion of it is shown in a pencil detail elevation on large scale. M. Ridet's grille for a garden enclosure is an excellent piece of metal design, very different from the English school, but good of its kind. This cannot be said of the Pavilion of the "Société des Acieries" erected in the recent Exhibition from the designs of M. Botrel; masonic forms of architecture imitated in metal. In connexion with this class of work may be mentioned M. Meissonnier's design for a lamp for electric street lighting, "Eclairage par lumière diffuse"—a lampost with a kind of umbrella feature at the top, the under surface of which is a reflector; the electric light strikes directly on that, and is hidden from the eye of the spectator, who only has the reflected light. This is an idea which was long ago suggested in England as a method of lighting interiors. Among these miscellaneous items may also be mentioned the interesting design of the "Bibliothèque Schoelcher" at Fort-de-France (Martinique), by M. Picq. This is a decorative treatment of a library and small museum standing alone on the beach (apparently), designed with a rather playful adaptation of classic details, and certainly a very original little building.

Among what may be called the "ideal" designs not previously mentioned—*i.e.*, designs which are merely conceptions on paper, is a very grandiose one by M. Bois for a school of artillery and engineering; a design of M. Delhaut for a provincial Conservatoire of Music and the Fine Arts, which illustrates the good effect that may be got by contrasting a richly decorated central block with two nearly plain wings, only ornamented by carved festoons between the upper windows; and M. Auburtin's design for a Palace for the reception of Sovereigns at Paris; an immense drawing showing a design which is fine in the general laying-out both of the building and the grounds, but contains only commonplaces in detail.

Among the large number of drawings illustrative of ancient work one of the most interesting is M. Chauvet's elevation of the woodwork and fresco paintings decorating the ancient manoir of Challant, at Issogne. The frescoes fill up the arches above the line of the wainscoting, and appear to be illustrations of industrial arts. The perfect manner in which the surfaces of wood and the masonry of the doorway, with its alternate white and bluish stone, is imitated, is quite a triumph of realism. The walls of the old house are scribbled over with curious inscriptions in old French, some of which are given. One runs as follows:—

"L'esprit humain ne se doit hazarder de contredire aux dieux ou retarder leur volonté, la puissance divine et du tout grande et faut qu'elle domine."

On the stone jamb of the door in the prin-

cipal drawing is an inscription roughly chalked and carefully copied in the drawing to the effect (not quite legible) that he who speaks ill of another may not enter by this door, concluding "car que d'aultry mal dira le diable lemporera."

Among other illustrative works we may mention three careful sets of drawings by M. Paquet of three Romanesque churches, those of Rhuis, Pompoint, and Fontenay-lès-Louvres; the plans of these are interesting. The curious little Palais de Justice of Briollay, a single rectangular building with a room partitioned off inside, is the subject of a set of drawings by M. Le Tourneau. M. Delaporte exhibits six good water-colour drawings in the grounds at Versailles. There is a view of Carcassonne by M. Pulsifer, and a very fine set of drawings by M. Pottier-Delinge of the ancient and celebrated château of Villers-Cotterets; the pencil sketches of detail are particularly good and very interesting, for the carved detail of this château represents the finest class of decorative work of the French Renaissance. Then we notice a restoration of the piscina of the church of "Ferté-Bernard," by M. Viatte, which introduces us to a most curious and interesting piece of Renaissance church detail; a photograph of its existing condition is added—the restoration does little more than complete some broken and partially defaced features.

It is regrettable to observe that the fine colossal statues of the arts, in white stone, in the portico of the Palais des Beaux-Arts, have already suffered so much from rain-stains as to have a rather unhappy appearance. Perhaps this will be least evident when the whole surface gets somewhat toned down by weather.

NOTES.

At the Royal Institution, on Friday the 3rd inst., Dr. Mercier gave a lecture on the subject of "Memory," in which he illustrated the action of the brain in memory by analogy with the action of inanimate substances under certain stresses. A bar of iron, under the stress of a slight weight, after bending, returned to its original position; under the stress of a heavier weight it acquired a "set," the "memory" of the strain to which it had been subjected. From this "set" it did not recover. The result, however, was different with an organised substance, such as a rod of wood, illustrated in this instance by a long slender whip-stock, which, though it took a set from a heavy strain, tended to recover from that set, at first comparatively fast, and then with diminishing speed until the normal position was at last recovered. The analogy with the action of the brain was, that the brain was only affected momentarily by slight impressions, but that stronger impressions left a "set" on it from which it only slowly recovered, the very stongest impressions leaving a permanent "set." Thus, if we looked out of a window at a new scene, and then turned away, the brain would retain for a time the main impressions—a mountain on the left, for instance, a wood in the middle distance, and so on; but the lighter impressions of smaller details it would almost at once lose; they did not overpass its limit of elasticity, and in re-

gaining its normal state the brain was like other organised substances—it tended to forget, to lose the impression, quickly at first, then more and more slowly, till the impression was totally effaced. The phenomenon of active memory, the effort to recall an impression which had faded, was touched on at the close of the lecture, especially the familiar case of the memory-searching for a word which it cannot at once find, and which seems afterwards to emerge of itself from some recess of the brain. That the philosophy of this aspect of the subject was not further elucidated was probably due to the Institution clock marking the expiration of the allotted hour for the lecture. We may add, however, on our own account, that the analogy of structural memory with mechanical suggests the curious and rather startling idea that memory is the result of a diseased condition of the brain; and that the physically healthy savage, occupying his brain only on matters of immediate importance to him, would be untroubled by memories. This certainly seems the natural deduction from Dr. Mercier's thesis.

The foundation stone was laid The New Baptist Church House, a few days ago of the new High Holborn. Baptist Church House to be erected at a cost of about 34,000*l.*, after Mr. Arthur Keen's plans and designs, Mr. John Belcher, A.R.A., having acted, we understand, as consulting architect to the trustees. The buildings, which will be distinguished by a central clock tower, with belfry stage and lantern, comprise a council chamber, a library, visitors' and committee rooms, together with various offices for the Baptist Tract and Book Society, and cognate purposes, and the first floor will be occupied by the Baptist Union upon their removal from their Missionary Society's House in Furnival-street, Holborn. The site has a frontage of 80 ft to Southampton-row (as widened), and one of 140 ft to Eagle-street; a portion of the ground was given to the trustees in compensation for the demolition in February last of their old Baptist chapel in Kingsgate-street, of which the southern end has been taken by the London County Council for the metropolitan improvements now in progress at High Holborn and Southampton-row. The chapel in Kingsgate-street was built in 1855-6, after C. C. Searle's designs, to replace the former chapel in Eagle-street, founded in 1735.

Some Rebuilding in Fleet-street. THE rebuilding, with an enlargement on the east side, of the offices of the Law Life Assurance Society, No. 187, Fleet-street, has now been completed by Messrs. Howard & Co., contractors, after plans and designs prepared by Mr. W. E. Clifton. The original offices were designed by John Shaw, the younger. The extension stands upon the site of the forecourt on the west side of the tower of the church of St. Dunstan-in-the-West; it has been erected against the side of the tower, and is carried up as high as the top of the second stage of the tower. The western forecourt was sold for 4,500*l.* to the Insurance Society by the trustees under the Act of 10 Geo. IV., cap. 96, for rebuilding the church, and it has been proposed to devote the purchase money to the building of a rectory house against

the eastern side of the tower. In that event the whole character of John Shaw the elder's church will be entirely spoiled. Upon the south side of Fleet-street, immediately opposite, a large space has been cleared by the demolition of Nos. 23-8, for the erection of a block of offices and shops from the plans and designs of Messrs. N. G. Joseph, Son, & Smithem. The present opening affords a view from the north of the Temple church. Descending the street we obtain a better prospect of the church of St. Bride, as we look down the recently-widened St. Bride's-avenue, where the houses, built from John B. Papworth's designs after the fire in 1823, have been pulled down, their sites (in part) being taken for new premises, in concurrence with the scheme for the gradual setting back of the line of frontage on that side of the main thoroughfare.

PROFESSOR WALDSTEIN, on Thursday last week, gave an interesting lecture at the Hellenic Society under the title "A Discovery of the Marbles related to the Pediments of the Parthenon." The marbles in question are not newly discovered; they have been for some years in a museum at Dresden, where no special value has been attached to them until Professor Waldstein noticed that they appeared to reproduce to some extent the line and attitude of the Ilissus and Theseus figures of the Parthenon, as if based on these as models. There are two statuettes, a male and a female figure, of which the former, the photograph of which was thrown on the screen, at once suggests the recollection of the Theseus figure, and some other examples were shown of statues which also showed certain derivations from this and the so-called Ilissus figure. Professor Waldstein's idea seems to have been that the Parthenon sculptures became to some extent a kind of model or school, and other works were produced which resembled them, not as copies, but as showing the influence of the recollection of these figures on the work of other sculptors. This is quite possible—perhaps even probable; but is it not also possible that the Parthenon figures of river-gods and heroes themselves represented an accepted type, which Phidias followed out for what may be called ritual reasons, while imparting to them a special power derived from his own genius?

MR. HOLDEN described last week in a paper read to the Institution of Electrical Engineers a meter which he had invented to register electric energy. At first sight the meter appeared to be a very complicated one. It did not register continuously, the electrical mechanism only operated for a second in every minute. This was effected by means of clockwork, which closed a circuit once every minute. Hence a magnetic impulse was given to the spindle of the meter sufficient to make it register two complete turns exactly at full load. It started to register with a current less than the fifth of its maximum current and the impulse made the spindle turn only the twenty-fifth part of a complete revolution. The wonderful accuracy of this meter was obtained by means of an iron disc fitted on the spindle and rotating in the neighbourhood of a permanent magnet. Hitherto in

most meters it has been customary to use a copper disc and to depend on the eddy currents induced in it for the "braking" effect. Mr. Holden's paper is a most scientific one, and whether his meter is the meter of the future or not, the theory which he has worked out is most instructive, and his paper, in our opinion, is a model of what a technical paper ought to be. Professor Ayrton suggested possible ways in which a consumer might attempt to get electric light for nothing by turning off his lights for the second when the meter was registering, but as Mr. Holden pointed out the chances were equally divided as to whether he would cheat himself or the company by this procedure. One curious point that Mr. Holden mentioned in his paper was that the reading of the meter was affected at light loads by its position relatively to the magnetic meridian. For example, if calibrated with the face pointing north and set up in the house with its face pointing south the error might be 4 per cent. in excess or defect. We had previously noticed this phenomenon in connexion with other meters.

MR. GAVEY, the electrician to the Post Office, showed the Poulsen telegraphone in action to the Institution of Electrical Engineers last week. The telegraphone, which was considered the greatest electrical novelty shown at the Paris Exhibition last year, is a magnetic rival of the phonograph. In the phonograph the sounds are registered mechanically on a wax cylinder, in the telegraphone they are registered magnetically on a long strip of steel ribbon. The same ribbon can be used over and over again to record conversations. To wipe out the preceding conversation it is sufficient to pass a magnet along the steel tape. The tape is made to pass either by clockwork or by an electric motor close to a telephone diaphragm, and the induced magnetism forms a permanent record of its vibrations. On moving the ribbon in front of the diaphragm again, identically the same vibrations are produced. Mr. Gavey by means of loud-speaking telephones reproduced perfectly a Danish song which had been sung into a Poulsen telegraphone four weeks before at Copenhagen. This illustrated that the steel tape retains its magnetism and makes a permanent record. The tone of the instrument is far superior to that of the phonograph, and to us it appeared practically perfect. Whether it will ever come into general use is another matter, but if it does it will have completely solved the problem of a relay for long distance telephony.

THE rejection by the House of Commons last week, on the second reading, of the Railway Company's "Omnibus" Bill prevents the Company from proceeding, for the present, with their schemes for various works, embracing an improvement of Holyhead harbour, new docks at Garston, on the Mersey, the widening of their line in the Trent Valley, and other projects. They are carrying out extensive alterations in St. Pancras Parish for an improvement of their lines into the terminus at Euston-square. It is on account of their default to discharge their obligations in respect of re-housing persons dispossessed by them on

the Stanhope-street, Granby-street, and Mornington-road area, that, as we read, the Home Office has preferred a claim of 16,000*l.* penalties under the Company's Act of 1898. The pulling down of house property in that quarter will ultimately extend to the villas and lodges with their pleasant gardens in Park Village East, along the Regent's Canal, Augustus-square, Mornington-road, and the immediate vicinity.

THE gallery of the Society of Mrs. Allingham's Fine Arts again contains a special exhibition of Mrs. Allingham's beautiful watercolours—a collection entitled "The Seasons (Spring, Summer, and Autumn)," the result of two years' work. The subjects are of the same class as usual; rural English landscapes, peopled with exquisitely-finished little figures, and the art displayed in them is as perfect as ever. There are a few studies of figures only, including two portraits of Carlyle, some children, and a lovely head entitled "A Country Lass" (37), the best of the works of this class; but for the most part the subjects present the usual programme; compositions chiefly of foreground and middle distance, consisting of cottages, foliage, and the little figures which give life to the scene without asserting themselves prominently. The variety in composition is so great that there is no feeling of monotony and the artist shows true judgment in keeping for the most part to the style of picture which she has made her own and in which she has achieved perfection. When she goes beyond it, as in the wider landscape entitled "Leith Hill from Haslemere" (56), there is just a suspicion of weakness—a too delicate treatment of a subject which requires more breadth and power of style to do it justice. But of the majority of the drawings we can only say that one seems as beautiful as another, and it is difficult to select any as specially attractive beyond their companions. The charm of composition is illustrated perhaps more especially in "On a Kentish Down" (5), "On a Blue-bell Hill" (7), "The Runaway" (10), and "On the North Downs in Early Spring" (23). In "The Cuckoo" (27) and "Into the Daisy Meadow" (66) we have the charm of extreme simplicity, little more picture material than a hedge and a gate and a single figure which gives the human interest to the scene. There are some flower garden studies, too, which are delightful; one subject out of the artist's usual range is "A Yorkshire Moor" (39), which is perfectly successful, and a few in which the building is the principal interest—"In a Kentish Village" (33), "Old Kentish House" (45), with its vertical lines of half-timber work, and "Cottages at Godalming" (65). "On Ide Hill, Kent," is one with rather more extent of the subject than usual; the village green and cottages in the foreground, and an extended distance are treated with the greatest delicacy. The beauty and sentiment of rural England has no such interpreter in painting.

M. LEON LHERMITTE, the French painter, is better known in this country by his charcoal drawings, which were first exhibited by the Black and White Society in the seventies, and received an enthusiastic reception. Since then his reputation has long been secure as a painter of a high order, who has year by

year been one of the foremost exhibitors at the Salon. An exhibition of his work in London, although limited in extent, gives an opportunity for studying some of this artist's remarkable work. The collection at the Goupil Gallery consists chiefly of pastels; there are a few pictures, and a number of charcoal drawings. The charcoal drawings are instructive for the refined handling of light and shade. "A Pastoral Visit" is one of the best; a scene inside a large Gothic church, a kneeling crowd receiving the benediction of their bishop; the drawing of a "Market Place" is also remarkable for the crowd. "At Mass" is a fine architectural interior. Pastels are often an excuse for carelessness and slipshod work. This artist's are worthy of study for the remarkable effects obtained in this medium. He is very fond of long shadows and shady foregrounds with a sunny distance, beyond, such, for instance, as "Gathering up the Hay," "Sunset in Autumn," "Le Pont de St. Père." A beautiful little picture of a different character is that entitled "Early Morning Fishing." The oil paintings exhibited are few and of less interest than the pastels.

At the Dowdeswell Gallery is an exhibition of paintings in oils by Vereker Monteth

Hamilton, consisting principally of sunrises and sunsets in Brittany and Kashmir. A collection of similar subjects from such widely different parts of the world is an interesting one. Kashmir—well known as it may be to soldiers and travellers, who have described its wonderful scenery with the pen—is not so well known on canvas, especially some of the out-of-the-way country here illustrated. A remarkable picture is that of "Sniping the Rearguard," in which two ragged Afghans, secure in the mountain heights with night closing down, are taking a long shot at the invisible enemy (presumably ourselves) beyond the ravine. A companion picture to this is "The Shot at Daybreak," a sporting picture of a more dramatic character than the first. The smaller pictures have on the whole the best work in them, such, for instance, as "Rose and Gold on the Jhelum" and the "Yellow Tree at Gunderbul," rare pieces of colour finely handled. "Après le Coucher du Soleil" is a clever little picture; and "La Grande Route" is a characteristic French highway with a fine avenue of poplars yellow with the glow of the setting sun.

THE Society of Miniature Painters are holding their sixth annual exhibition. The exhibition is held in a room to itself at the Modern Gallery, free from other pictures that so often render it impossible to study miniatures to the best advantage. A miniature, like a sonnet, may contain a whole world of beauty and imagination; it is, besides, one of the most charming forms of portraiture. It is an art of perfection, and for this reason, perhaps, attracts only a limited number of artists. These provide the real interest of such an exhibition as the present, while the large number of exhibits are of the dull and worthless coloured-photograph type. Mlle. Cécile de Chausse has a work notable for size and for its vigorous treatment—it is one of the largest ivories we have seen—entitled "Judith." It is not quite our idea of the appearance of that

remarkable character, who we imagine as rather an inspired patriot than as a haughty amazon; but the work is a telling one. Interesting, too, is a work entitled "Vivien," very much spoilt by the exuberance of the frame. For good technique and for values, Miss Winifred Hope Thomson's portrait of the Lady Elizabeth Manners may be considered the best thing in the exhibition. "Pieces of Eight," by Mr. John Hassall, is a fine piece of work, and would, we think, have satisfied R. L. Stevenson himself. Noticeable also is a portrait entitled "Madge," very direct and simple in treatment; and in the same case, by a different hand, is a well-drawn portrait called "Olivia." For variety, we suppose, is shown an extraordinary little picture entitled "The Yellow Book," by Mr. Dudley Hardy, full of cleverness and careless decadence.

PICTURES AT THE ROYAL ACADEMY.

THIS may be described as an interesting but not a remarkable Academy. There is no picture that imposes itself on one as the great work of the year; for M. Benjamin-Constant's portrait of the late Queen owes its ostensible pre-eminence to position and subject. At the same time we must say that we can neither understand nor sympathise with the tone of detraction applied to this picture by critics and visitors. It is not a great work, but it is on the whole a very fine one, a dignified and expressive portrait of a great sovereign. The mistake in it seems to lie in the over-accentuation of decorative details which should have been kept subordinate to the figure; it is not so much a portrait of Queen Victoria as an interior in the midst of which she is seated; the figure does not detach itself sufficiently from the surroundings. But that is not a reason for speaking of it as a poor work, which it certainly is not.

Of the pictures which deal with the human form and with human interest (apart from portraits) the first important one which we meet with, Mr. Dicksee's "Yseult" (52), suffers under the same disproportion as M. Benjamin-Constant's portrait just referred to; the accessories kill the figure; it is a mass of gold throne and crimson drapery, powerfully and brilliantly painted, but the head is tame and devoid of character and power, and might belong to any name of a mythical queen or princess one chose to put to it. The most important works of the figure class are perhaps Sir L. Alma Tadema's "Under the Roof of Blue Ionian Weather" (220), Mr. Abbey's "Crusaders Sighting Jerusalem" (163), and Mr. John Collier's "In the Venusberg" (724). In point of scale and finish the latter might be called the most important work of the year; in a decorative sense it is superb, but it is entirely destitute of the romantic spirit which such a subject demands. Mr. Collier is an admirable painter but no poet; and but for the nudity of the figures this might pass for a stage scene. Venus, her lower limbs enveloped in a rich drapery, sits under an alcove in a carved marble screen which extends across the picture; a knight in armour kneels before, and a nude damsel stands beside her in an attitude of beckoning to some one, her beautifully designed figure relieved against the marble background. As a decorative picture it is of a high order, but its interest goes no further than that; there is none of the glamour about it which we associate with the idea of the Venusberg. Mr. Abbey's "Crusaders" is a work of much more serious aim; it is an upright in which the main lines of the composition are carried up in a very effective manner obliquely across the canvas, culminating in the flag which the standing figure holds up. There are only three principal figures, the one on the right kneeling; there is a fine general impression of triumph and earnestness of purpose conveyed in the group, but the countenances, taken separately, are somewhat deficient in definite expression. In background a portion of a crowd of figures is seen struggling up the hill, dragging with them what appears to be a catapult or some such medieval engine of war. A fine work, but certainly not equal to the best we have had from its author. Sir L.

Alma-Tadema does not aim at any meaning or story in his works; they are "simple beauty and naught else," which we are told on high authority is "about the best thing God invents," and in this respect he has seldom surpassed "Opus cccxliii." (so it is inscribed), which occupies a centre position on the south wall of the long gallery, instead this artist's customary position near the doorway. The scene is occupied largely by the semicircular marble steps of a small theatre, with a sculptured altar and balustrade on the right—more marble even than usual; on these recline or stand various figures in delicately harmonised draperies; over the boundary wall of the semicircle is seen the distant deep blue sea; as a bit of classic beauty the whole is perfect. The President's "Helena and Hermia" (169) faces it on the opposite wall, "like two artificial gods," as the quotation from the "Midsummer Night's Dream" has it; one is tempted to make a pun and suggest "too artificial" as the appropriate reading; they are two very hard and mechanical young women. Mr. da Costa's large picture above it of "Serena Captive" among the forest robbers ("Færie Queene") is bold and effective in colour, but if Serena wore all the "rich array" they are robbing her of she must have found her apparel a heavy drag upon her. Mr. Waterhouse's "Nymphs Finding the Head of Orpheus" (231) deserves appreciation as a beautiful piece of colour and design, though suggesting that the head of Orpheus floating in the water, and to which the nymphs seem to pay no attention, has been added as an afterthought for the sake of a title to the picture. Beyond these the long gallery displays nothing of importance in the way of ideal figure subjects.

Gallery IV. contains two large and bold attempts at pictorial allegory, Mr. Stock's "Pain bringing Wings to a Soul" (251), and Mr. Mulock's "Dying Day" (255), the latter represented by a large powerful semi-nude figure embedded in a mass of foliage and reddened one may suppose by the setting sun. Mr. Stock's group is of the nature of a Blake design on a large scale, and does not quite escape a suspicion of the ludicrous; the idea intended is perhaps a little too complicated for expression in painting; but we feel every sympathy with artists who are thus endeavouring to use the figure in an abstract and poetic sense. Mr. Sims's large picture between these, "Spreading their Wings" (254) does not explain itself very well; it seems to represent a party of people who have landed from a yacht and are flirting in a deserted churchyard; it is a kind of work one would have expected to find in the Salon rather than in the Academy; there is in fact a very French feeling about it, and the figure of the girl walking on the bank and relieved against the sky reminds one rather of Fragonard, but the picture has not point or meaning enough to justify its scale. Mr. Shannon's small picture "The Flower Girl" (274) is a real work of art, a vision of colour and light. Mr. Seymour Lucas has a clever picture (300) of Wolsey, in the garden of Hampton Court, mocked by three courtiers after his fatal interview with the King—it is evidently suggested by Act III., Scene 2 of Henry VIII., though this did not take place at Hampton Court. Miss Dicksee's picture of Laurence as a little boy, taking the portrait of a lady passenger who stopped at his father's inn, is a pretty and natural work of its class. Two pictures of curious originality and novelty claim mention. One is Mr. Lybaert's "The Evening of Life" (80) a very medieval-looking painting of an aged *religieuse* with pinched and furrowed face, clad in a crude green mantle; a piece of elaborate embroidery stretched across forms a background, and is painted with astonishing realism; it is an affected form of art, but undoubtedly very clever, and we shall probably hear more of its author. The other is Mrs. Hunter's little picture of "Joy and the Labourer" (497); "Joy" being personified by a girl seated on the wall and singing to the labourer; it illustrates a passage from one of Miss Ingelow's poems. This also is not beautiful; but it is original and sincere.

Mr. Stanhope Forbes's "The 22nd of January, 1901," a cottage interior group gathered over the paper containing the news of the Queen's death (320), is his most interesting picture, not however by any means equal to various former works of somewhat the same class. "Good Bye—Off to Skibbereen" (495), a larger picture by the same artist, is a harbour scene

which does not interest us very much. Mr. Boughton's "Dreamland" (355), where a girl lies asleep in a very faintly coloured landscape, looks at first rather weak and washed out, but seen from a greater distance, across the room, it falls together into the pretty half-visionary effect which was evidently intended. After many commonplaces we find in Mr. A. Goodwin's "The Phantom Ship" (438) a work of real power; the actual ship is in the foreground, with the crew gazing at the "phantom" which passes in the middle distance, all the wind in her sails, and with an indefinable supernatural something about her which is very telling. In connexion with this subject may be mentioned Mr. P. W. Gibbs's clever picture of "The Ancient Mariner" (822) standing against the mast in his heat-baked ship with the bodies of his former companions strewn about, the dead albatross lying between his feet with supernaturally cynical expression in its head; able work, showing a vivid imagination. Of other works of the class we are now speaking of may be mentioned Mr. C. M. O. Orchardson's "Memories" (520), an expressive figure of a girl playing the piano; Mr. Denny Sadler's "Marriage by Registrar" (570), the nature of which every one will be able to figure to himself; and Mr. F. D. Millet's "An Accusation of Witchcraft" (857). Mr. Draper's "Tristram and Iscult" on board the ship (561) is an important work in intent, but the figures are totally short in dignity and are not worthy of the subject; nor has Mr. Chevallier Tayler made much of "The Origin of the Order of the Garter" (586), a hard painting of a subject out of his usual work, and which he has not rendered interesting.

Portraits are well represented this year, and one of the very best, both as to likeness and artistic character, is Sir L. Alma-Tadema's portrait of Professor Aitchison (211) painted for the Institute of Architects. The Professor is characteristically represented with a book in one hand and a finger of the other hand raised as if enforcing an argument—perhaps a point as to the authority of Vitruvius. Another architect portrait is an exceedingly good likeness of Mr. T. G. Jackson, seated before a table covered with plans; by Mr. Hugh G. Riviere. Among the leading works in portraiture of the year is Mr. Sargent's of the two Misses Wertheimer (178), effectively contrasted in a dark crimson and a white satin dress respectively, and painted with the artist's highest power of broad and effective execution. Mr. Dicksee's "Duchess of Buckingham and Chandos" (122), like his "Ysult," is too much like a painting of a rich costume to which the face is entirely subordinate—what we call a portrait *de luxe*. Mr. Shannon's portrait of Mrs. Walter Fenwick (498) is remarkable for the bold treatment of the composition in flowing lines. Mr. Orchardson in his portrait of a gentleman seated under a tree with a gun (377) has shown his usual power of getting harmonious colours out an ordinary man's costume—shooting-dress in this case. One of the most characteristic and energetic portraits of the year is Mr. Sargent's half-length of Mr. C. S. Loch. In several portraits of children Mr. Ralph Peacock has shown uniform and conspicuous success in combining character with a fine and rich effect of colour.

War pictures are rather numerous but not remarkable, unless we except Mr. Furse's fine equestrian portrait of Sir Charles Nairne (222), which however is not in an active sense a battle scene, and Miss Kemp-Welch's "In Sight" (417), in which this lady has turned her facility for painting horses to illustrating "Lord Dundonald's dash upon Lady Smith." Among the pictures in which figures are combined with landscape Mr. Clausen is, as usual, very successful, especially in "Sons of the Soil" (378), and Mr. La Thangue in "Gathering Plums" (308). Mr. John R. Reid has a fine coast scene in the first room "Sons of the Sea" (45) in which the human element consists in a row of little boys of the fishing population seated on the jetty; the picture has that clear open-air effect which this artist always succeeds in obtaining. Mr. Tuke's youths amuse themselves with a boat in "Summer Evening" (396), but this time they are clothed; as a matter of pictorial effect we prefer them nude. "Idlers" (411), by Mr. Dudley Hardy, is a curious but truly artistic work the subject consisting of a set of figures in Turkish costume seated on the ground in combination with a fine and very broad-painted bit of landscape which, however, shows no sign of being the natural abode of Turks;

it might be an English scene; but this is a fine little picture. Nor should we omit to mention Mr. Orchardson's charming little idyll, so original in colour and conception, entitled "In the Gloaming" (126).

The finest landscapes of the year are the sea-pieces, if one may put it in an Irish kind of way. Mr. Somerscales has two pictures which repeat his usual materials—a dark sea and one or two craft on; probably it is because he rather repeats himself that the Academy have taken to sending his pictures up aloft, as a hint that something more is expected of him. Mr. Hemy has an admirable work in the second room, "The Home Wind" (85), with a fishing smack running before it in fine style (Mr. Hemy can make a boat go through the water better than most men), but his most important picture is "Birds of Prey" in the fifth room (383), the title being derived from the figures of some wreckers on a rocky shore against which beats a sea driven by a strong gale; a very fine wild scene. But this again, to our thinking, is outdone by its companion by Mr. Wylie in the same room, a Bay of Biscay sea suggested by Mr. Kipling's spirited poem which describes "how we threshed the *Bolivar* out across the bay"; the funnel and the mast are seen in the background "lurching through the spray." This is no conventional sea; hills of water come along with foam on their backs; it looks like a study from reality, and is perhaps the most powerful thing Mr. Wylie has done. The same artist has a fine picture of the naval funeral procession of the late Queen (272).

There are a good many pleasing landscapes; some very good ones; no great one. Mr. Waterlow seems to be the landscape-painter now who best understands composition and unity in landscape painting. One may appreciate this by comparing his small picture "The Old Sandpit" (919) with Mr. Murray's "Lush Meadows of the Test" (912) which hangs near to it. The latter is the larger and more elaborate work, but it is only a scene—Mr. Waterlow's is a picture. In his larger works, such as "Sheltered Pastures" (49) and "Hoghton Mill" (147) we see the same fine quality of composition, though neither of these are quite equal to his pine-forest by the sea of last year. But this is really landscape art, and not mere transcription of nature. Mr. Arnesby Brown's "Morning" is a fine work. Mr. Adrian Stokes, another genuine landscape artist, has chosen only scenery this year, his sole contribution being a view of Trafalgar Square, which is not hung in a very favourable light. Mr. A. Goodwin's "Sinbad the Sailor in the Harbour of Salaha" (784) may also be counted as a city landscape, in this case not trammelled by hard facts. The "Arabian Nights" has furnished him with matter for another landscape, under the title "Ali Baba and the Forty Thieves" (53), which at first sight is rather startling in colour and effect; it is an attempt to represent the glitter of everything under an intensely hot sun; the sprays of foliage look as if cut out in steel; the effect seems exaggerated, but there may be the intention of giving an unreal and dreamlike effect. A perfect little work is Mr. Mark Fisher's "Summer Afternoon" (289); the treatment of the water is beautiful, it seems actually to ripple, and we quite lose the feeling of paint. Of Mr. H. W. B. Davis's works we like best the small one, "Evening" (127), in the second room; "The Nearest Way Home" (162) is rather a repetition of former effects. So, in another way, is Mr. Graham's "Collecting the Flock" (164), a fine and powerful landscape, if we had not seen so many like it before. Mr. Mostyn's large landscape "Stepping-stones" (171), which hangs near the ceiling in the large room, though rather crude in tone, has a fine breadth and breeziness about it which seems to give promise of further work from its author. Mr. R. W. Allan's "After the Boats Came In" (256) is worth a note in respect of the fine way in which the wash of the sea on the coast outside the harbour is conveyed. Mr. MacWhirter has painted two views of Edinburgh, the New Town and the Old Town (333, 341); Mr. J. H. Reid's "Ferryden" (431) is a fine coast landscape; Mr. East's best work is "A Glean Before the Storm" (486); Mr. North exhibits a fine picture of "Earth's Children of the Quarry" (562) representing masses of trees which have overgrown the declivities of a huge deserted quarry; Mr. John Brett, who unfortunately has contributed no large work, has some beautiful coast scenes in the "small" gallery, No. IX.,

especially "Cataclew Point" (687), and in the same room is a beautiful little landscape by Mr. Clausen "The Spreading Tree" (652), and another by Mr. La Thangue "December in Provence" (669). Mr. Corbet's long narrow picture of "Val d'Arno—Evening" (863) not striking at first sight, is a work that grows upon one, as an illustration of evening effect over an extended Italian plain.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ANNUAL GENERAL MEETING.

The annual general meeting of this Institute was held on Monday evening at No. 9, Conduit street, Regent-street, W., the President, Mr. Wm. Emerson, in the chair.

The minutes of the last meeting having been taken as read, the Report of the Council for the official year 1900-1901 was submitted. The Report stated that his Majesty has graciously consented to continue as King the patronage which he has extended to the Institute as Prince of Wales since the year 1863, and it is also his Majesty's pleasure to continue her late Majesty's generous grant of an annual Royal Gold Medal to the nominee of the Royal Institute. The non-award of the Royal Gold Medal for this year has been unavoidable, and though the Council regret a break in an institution that has been continuous for fifty-three years, yet they feel that, in future years, the gap in the list of Gold Medalists opposite the year 1901 will in itself be a mute and pathetic record of the irreparable loss of the Royal and gracious donor.

Since the publication of the last annual Report the Council have held twenty meetings of which the Council elected in June last have held sixteen. There have also been meetings of the following Committees of Council—Finance, Professional Questions, Annual Dinner, Conditions of Contract, Paris Exhibition, Professional Advertisement, New Institute Premises, Special Congress, Architectural Museum, Heating and Ventilating Engineers. Meetings of the following Institute Committees have also been held:—The four Standing Committees, Board of Examiners, Statutory Board of Examiners, Competitions, Prizes and Studentships, Professional Status, Ancient Lights (joint with Surveyors' Institution) Local By-law, General Congress.

The following tabular statement shows the present subscribing membership of the Institute, compared with that of the corresponding period last year:—

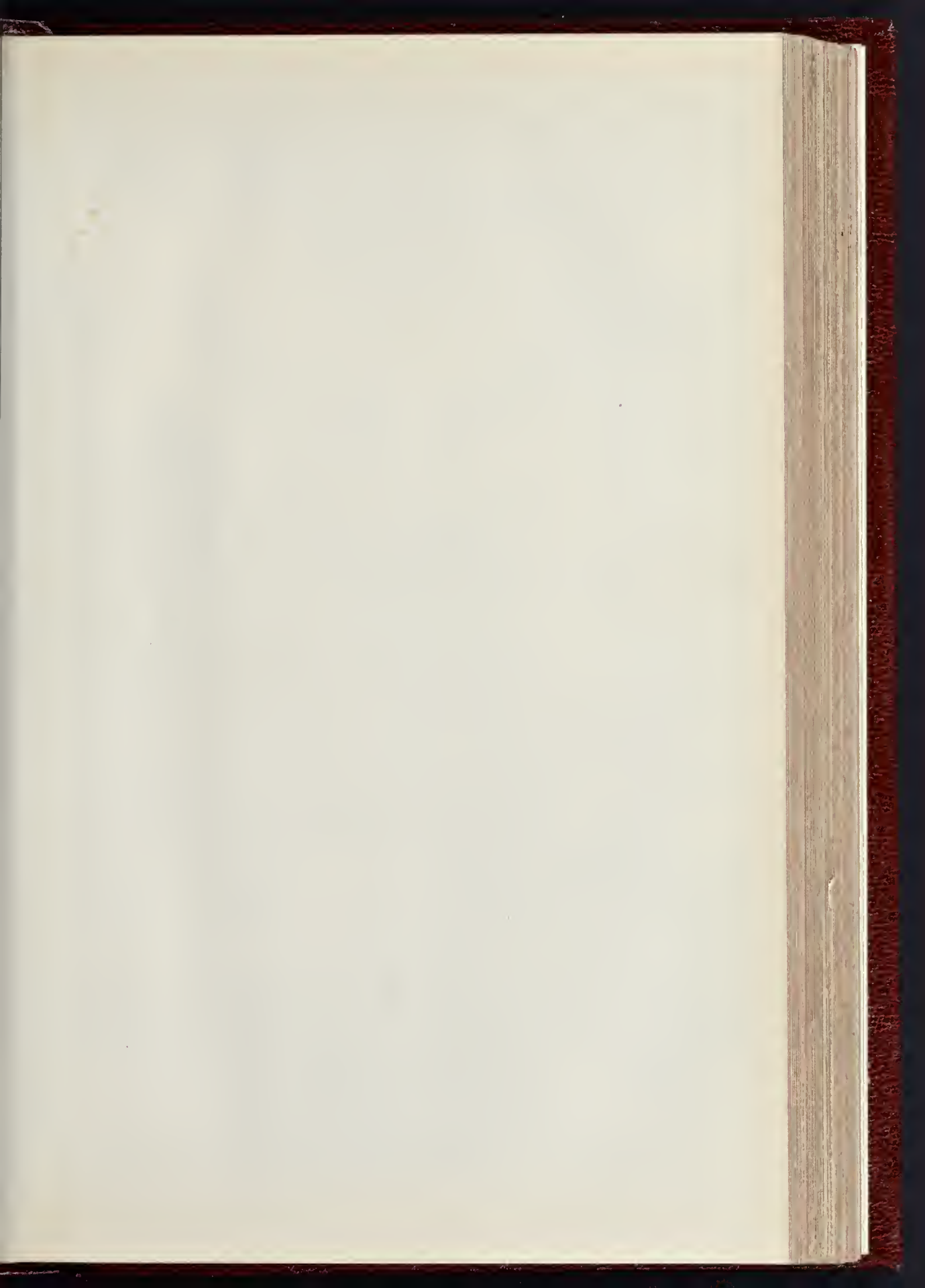
Year.	Fellows.	Associates.	Hon. Associates.	Total.
1900	620	1,013	45	1,678
1901	626	1,028	46	1,695

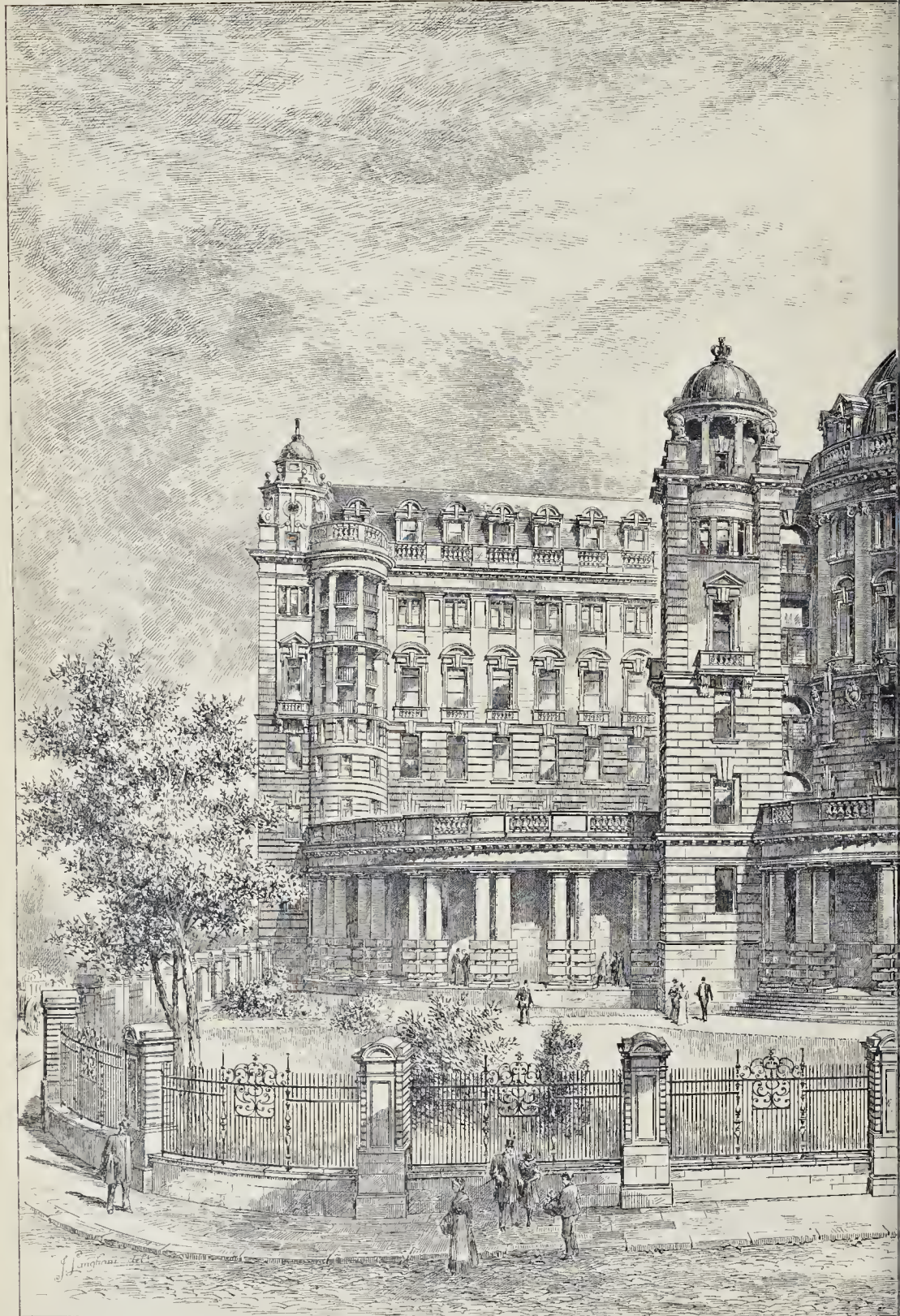
During the official year since the last annual general meeting twenty-nine Fellows have been elected, forty-six Associates, three Hon. Associates, and one Hon. Fellow. Two Hon. Corr. Members have been elected: J. Antoine Bouvard (Paris) and J. G. Pedro d'Avila (Lisbon).

The Council must attribute the smallness of the increase in membership in the class of Fellows to the more than usually heavy losses by death, by resignation, by transference to the class of retired Fellows, and by other removals from the list. There have been only three special elections to the fellowship by the Council under the new proviso to By-law 9, as compared with eleven last year and twelve the year before. On the other hand, the ordinary elections to the fellowship by the general body have been twenty-seven, as against twenty-one, fourteen, and eight respectively in the three preceding years.

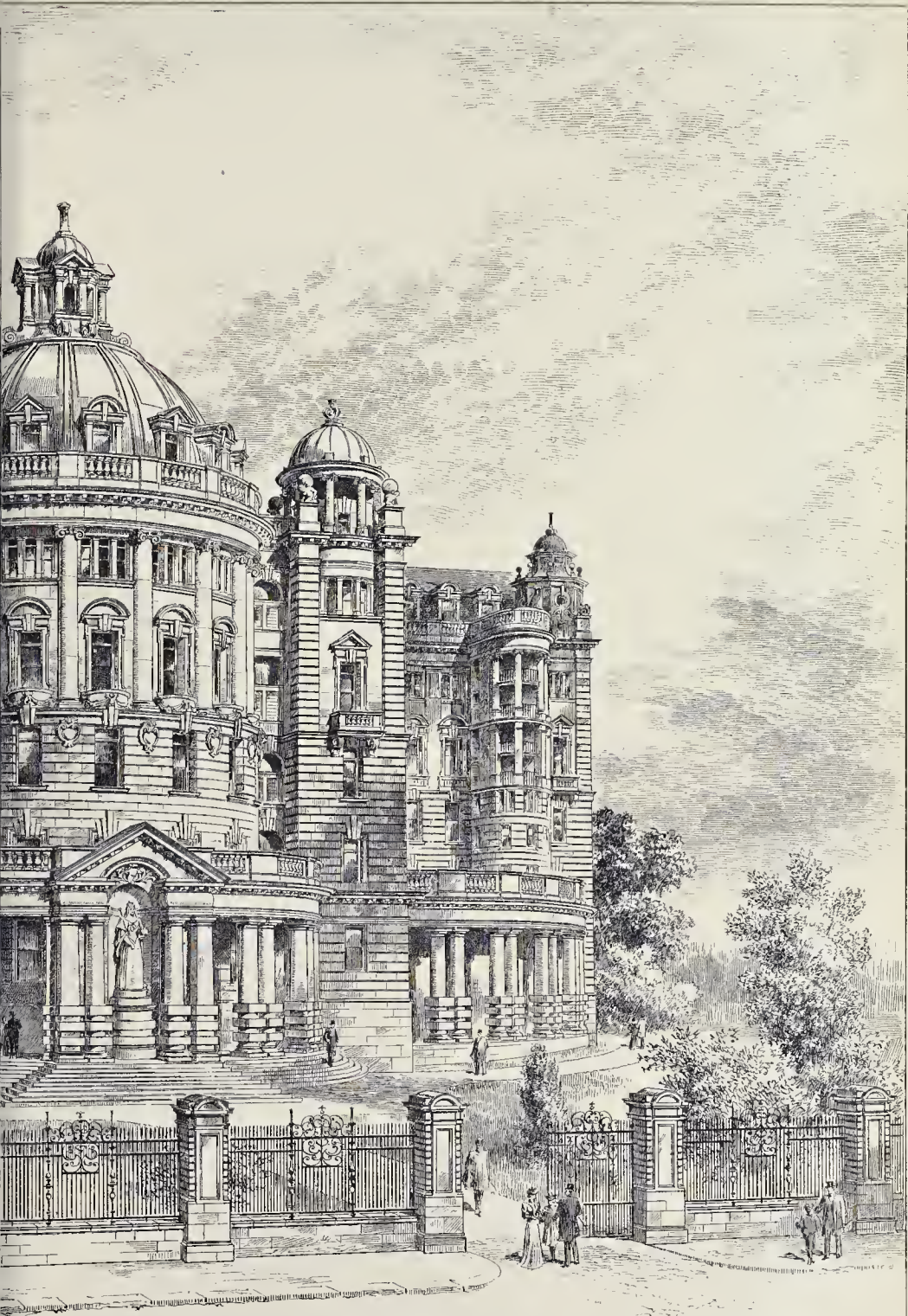
The losses by death have been as follows:—Fellows: Charles Barry, Henry Cowell Boyes, John Burnet, John Butler, Francis Chambers, Henry Currey, Charles Henry Driver, William Charles Evans-Vaughan, Joseph Goddard, Horace Gundry, Edward Joseph Hanson, Thomas Harris, William Hepper, Newton Edward Jennings, Thomas Meakin Lockwood, William Henry Powell, John Murray Robertson, Lloyd Taylor, James Buckley Wilson, William Young. Associates: John William Blakey, Frederick Boreham, Henry Greenslade Wade. Retired Fellows: Henry Astley Darbishire, William Milford Teulon, John James Thomson. Hon. Corr. Members: Giuseppe Poggi, Antoine Henri Revoil, Jules Jacques van Ysendyck.

The usual progressive examinations were held in June and November, 1900, and the



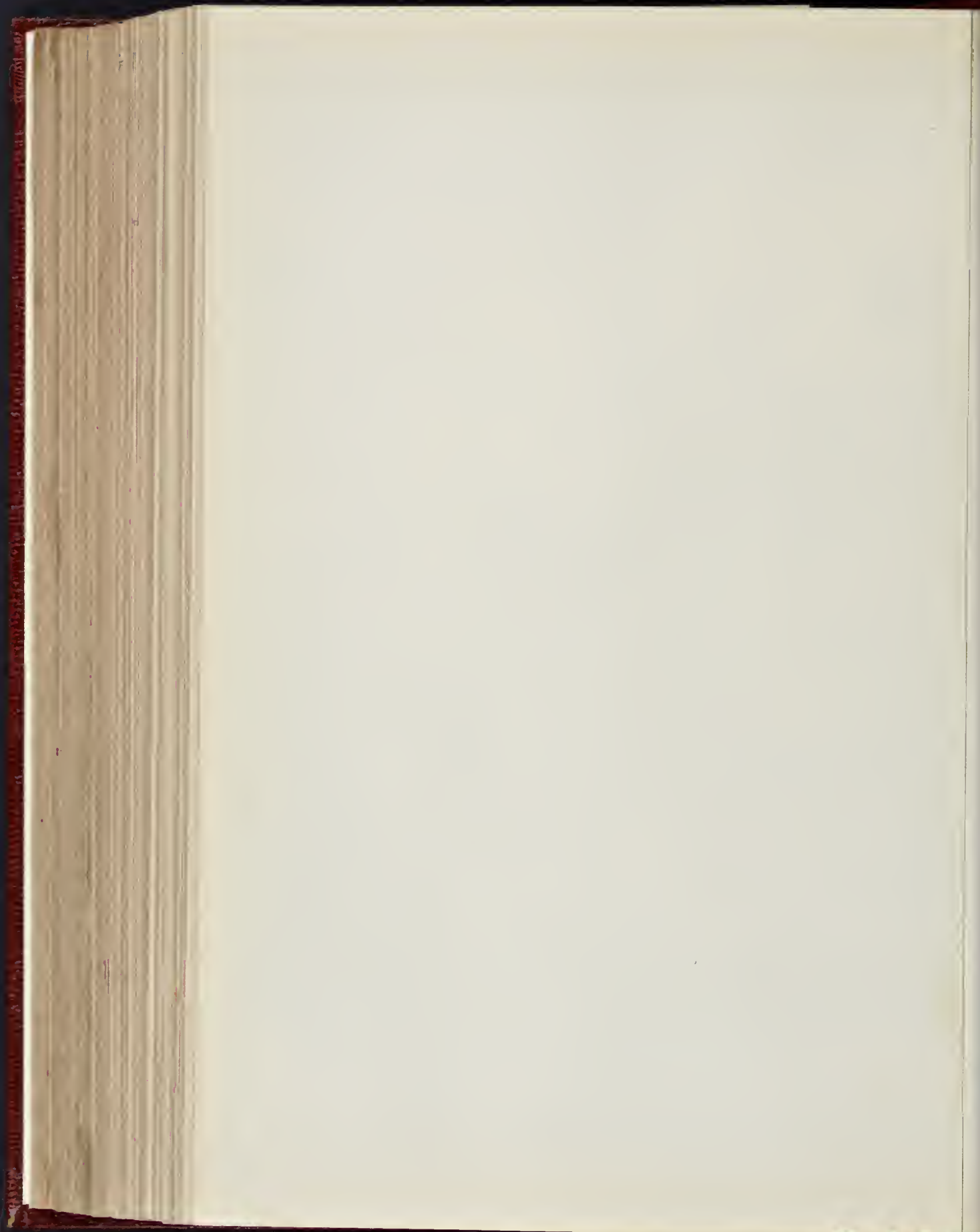


COMPETITION DESIGN FOR GLASGOW ROYAL



View from Cathedral Square

PHOTO-LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



Council have to report a steady increase in the number of candidates for each of the examinations. The Preliminary and Intermediate were held in London, Birmingham, Bristol, Cardiff, Manchester, Newcastle, Nottingham, and York, and the very cordial thanks of the Council are again due to the hon. secretaries and examination committees of the various allied societies for their ready and valuable assistance. The Final and "Special" examinations were held in London only. The total number of candidates examined during the year was 603, as against 548 in 1900. The number of probationers of the Institute now stands at 1,507, and of students at 368.

The Council again regret to say that the Arthur Cates prizes for the best testimonies of study (supplemented by certain specified sheets of drawings) submitted by students for admission to the final examination have not been awarded this year, no student who had passed the examination having fulfilled the conditions. The Ashpitel Prize has been awarded to Mr. Shirley Harrison, who passed the Final Examination in November, and extra prizes to Messrs. C. E. Vardell and Heaton Comyn. The "Special" Examination will be held this June in Sydney and Montreal. The Council desire to tender to the Board of Examiners their very warm thanks for the arduous task they have performed with such devotion and energy. Statutory Examinations were held in October and April last, when Certificates of Competency were granted to Messrs. Richard Dominic Hanson, Herbert Alfred Legg, James Edwin Webb, Sidney Joseph Halse, and Frank Sizer Capon.

The collection of paintings of the Royal Institute has been enriched by an admirable portrait of Professor George Aitchison, R.A., Past President, by Sir Lawrence Alma-Tadema, R.A. As a mark of their appreciation both of the constant and kindly services Sir Lawrence has rendered to the Institute for the twenty-four years of his membership as an Hon. Associate, and of the great eminence to which he has risen in his art, the Council took the opportunity of his painting this portrait to ask him to allow them to propose to the general body his election as an Hon. Fellow. Sir Lawrence was duly elected at the general meeting on February 18.

The Council have the pleasure to record the fact that the President, Mr. William Emerson, is a member of the advisory sub-committee of the general committee on the question of the National Memorial to her late Majesty. The President was also a member of the Art Committee of the Royal Commission for the Paris Exhibition, 1900.

The Council have been invited by the authorities of the Glasgow International Exhibition, 1901, to contribute to the Fine Art Section an exhibit from the collections of the Royal Institute, a bay in one of the galleries being placed at their disposal. The Council have complied with the request, and have sent the portraits of Professor Cockerell, Sir Gilbert Scott, and Mr. F. C. Penrose; marble busts of Inigo Jones, Sir Christopher Wren, Sir Charles Barry, and George Edmund Street; and a large number of drawings. The Council have acceded to the request of the Glasgow Institute that the Royal Institute of British Architects' Annual Dinner shall be held this year in Glasgow. It will take place on Thursday, October 3. An interesting programme has been drawn up for the visit, and the Corporation of Glasgow have kindly arranged to entertain the Royal Institute at a reception on Friday evening, October 4. The Council most earnestly hope that as many members as possible will attend, so as to ensure the success of the gathering.

The Council have had long negotiation with the London County Council with reference to the Holborn-to-Strand improvement scheme. With a view to securing proper architectural treatment for the crescent site, the Council were asked by the London County Council to co-operate in a scheme whereby eight architects, four to be nominated by each body, should submit designs, on certain conditions, each architect receiving an honorarium of 150*l.* A deputation of the Council waited on the Improvements Committee of the London County Council and protested against the proposed conditions. They suggested that there should be a competition among the eight architects, and that three should be chosen to carry out specified blocks, working together, however, as a consultative committee on the whole scheme. The interview resulted in a few modifications in the conditions as to the

details of drawings required and an increase in the honorarium offered to 250*l.* The Council were given to understand that there could be no guarantee that any of the eight architects should execute all or part of his design, and the invitation to co-operate was renewed on the slightly modified basis. Desirous of aiding the London County Council in their efforts to secure architectural treatment for the new street, the Council accepted the invitation under strong protest, and nominated four architects. Their names were Messrs. Reginald Blomfield, T. E. Colclutt, Ernest George, and R. Norman Shaw. Two of them, Messrs. Colclutt and Shaw, declined the nomination. The Council were requested to nominate two others in their place. In view of the London County Council's disregard of their protest accompanying the original nomination, the Council considered that they had gone as far as was consonant with the dignity of the Institute, and the profession which it represents, to meet the wishes of the London County Council, and formally declined to make further nominations.

Another matter to which the Council have given their attention is the alteration of the steps of St. Martin's Church. The London County Council were asked by the St. Martin's Vestry (now merged in the Council of the City of Westminster) to contribute towards the cost of the proposed alterations, which consisted in doing away with the broad platform in the middle of the flight and moving up the lower steps, thereby widening the pavement. The London County Council sought the advice of the Council of the Institute. Acting on the Report of the Art Committee, the Council protested against any proposal to touch the steps, both for artistic reasons and on the ground that the traffic was not so great as to necessitate any widening of the pavement. They urged, however, should the need for widening be found imperative, and consequently the abolition of the landing on the west side, that at all events the landing on the south side should be retained for the sake of architectural proportion. The London County Council adopted the Council's view, and refused the St. Martin's Vestry and the City of Westminster any financial assistance. In reply to a protest from the Council, the Town Clerk of Westminster replied that the work, having been already begun, must be proceeded with.

The London County Council also submitted for the opinion of the Council their draft by-laws under the Metropolitan Management Acts as to the deposit of plans with reference to pipes, drains, and other means of connecting with sewers. The main suggestion of the Council was that in lieu of elaborate duplicate plans and sections, which it was proposed that any one about to construct or reconstruct drains, &c., should deposit with the Sanitary Authority, it would be sufficient if one carefully-prepared block-plan were sent.

The Council, having been invited by the Bridge House Estates Committee to offer their suggestions on the proposed plans for the widening of London Bridge, referred the matter to the Art Committee, and adopted their Report. While deprecating any interference at all with the structure, they suggested, in case of necessity, an alternative scheme whereby the face of the parapet should be restricted to the line of the existing piers instead of overhanging them. The latest information received from the Corporation is that consideration of the scheme has been referred to a Sub-Committee of the Bridge House Estates Committee.

Adopting the Report of the Art Committee, the Council have addressed a protest to the Ecclesiastical Commissioners and the Lords of the Privy Council against the Union of Benefices Bill as drafted when introduced before Parliament last year. They urged that this Bill to extend the Union of Benefices Bill, 1880, to the whole of England and Wales should contain provisions whereby precious architectural monuments should be safeguarded against the destruction that has been permissible and practised in London under the provisions of the existing Act.

The Council adopted the Report of the Science Committee on the new regulations proposed by the London water companies, and sent in a protest, together with criticisms of the proposals, to the Local Government Board, by whom they were invited to send representatives to the inquiry held at the Guildhall, Westminster. Before final arrangements could be made for receiving the evidence of

these representatives, the water companies withdrew their proposals and the inquiry terminated. The thanks of the Council are especially due to Mr. H. D. Searles-Wood for the time and trouble he devoted to the matter on behalf of the Institute.

The Council, adopting the suggestion of the Science Committee, sent out in January to the Corporation of the City of London, the London County Council, and all the new Metropolitan Borough Councils a circular letter with reference to the administration of the various Acts of Parliament in relation to the construction, &c., of drains and sanitary appliances and the structural removal of nuisances. They suggested that the question of detection of nuisances should remain in the department of the medical officer to the authority, and that matters relating to the construction, &c., be placed in the department of the surveyor to the authority.

The Council have also adopted the Report of the Science Committee with regard to a scheme suggested by the Plumbers' Company for the half-marking of plumbers' work, and they have arranged with the Plumbers' Company for a conference to be held between the Company, the Royal Institute, and the water authorities, with a view to settle the best kinds of materials and forms of fittings used in plumbers' work, and to provide a basis for regulations on the subject.

The changes in By-laws 25, 29, and 30 were approved by the Privy Council on May 15, 1900. The approaching elections will be conducted, therefore, under the new regulations. The total number of the Council will be thirty-eight; there will be four Associate members; any Associate will be eligible for election; and the asterisks against the names of members of the existing Council and Standing Committees will be omitted.

The Council regret that their negotiations with the Institute of Builders, extending over a space of two years, have come to a fruitless conclusion. After much effort, suggestions for a revised form of contract were agreed upon by representatives of the two Councils. The arbitration clause was found, however, to be so unacceptable to the general body of members that no resolution was moved from the chair at the general meeting. The form was discussed, and the Chairman, on behalf of the Council, promised a revision of the arbitration clause before presenting it again to the Institute. The Council submitted to the Institute of Builders a revised arbitration clause in which "Clause 16" (Materials) was inserted among the clauses exempt from the operation of the arbitration clause. The Council of the Institute of Builders accepted this proposal on the condition of certain changes being made in Clause 16 itself, which practically rendered its inclusion among the exempted clauses nugatory. A deadlock occurred, and the Council reluctantly declined further negotiation on the subject with the Institute of Builders.

In accordance with the resolution of the general meeting held on April 9 last year a joint committee of the Institute and the Surveyors' Institution have had many meetings to consider alterations in the law of ancient lights. This Committee—which received the most valuable assistance from Mr. J. Fletcher Moulton, K.C., M.P., and Mr. G. Malloes Freeman, K.C.—issued a Report to the Councils of the two bodies. The Committee has been further authorised to draft a public Bill on the lines of their Report, and to submit it for consideration to the two Councils. The Bill is now in the hands of a Parliamentary draughtsman.

The Institute's publication, "Suggestions for the Conduct of Architectural Competitions," has been reissued as amended at the general meeting on January 7.

The Competitions Committee have caused stamped and addressed postcards to be sent to the hon. secretaries of all allied societies, with a printed form at the back, to be filled up by them with details of any proposed competition in their districts of which they may hear. On receipt of one of these, the Secretary has instructions to write at once to the promoters, urging that the competition be conducted on the lines of the Institute "Suggestions," a copy of which is enclosed.

The Council have renewed the representations made in 1889 to the Local Government Board concerning the Administration of Building By-laws in non-Metropolitan Districts. A deputation was received by the Parliamentary

Secretary, Mr. Grant Lawson, at the Local Government Board, on March 12, when a draft set of By-laws for the use of Rural District Councils, drawn up by the Local Government Board, was submitted for the opinion of the Institute. The Council have forwarded to the Local Government Board the suggestions of the By-laws Committee with regard to this draft.

The Council, having learned that the University of London were about to proceed to the appointment of a Board of Studies for Fine Art (including architecture), took measures to lay before the authorities the desirability of the Royal Institute being specially represented on the Board. The Council are gratified to report that the choice of the Senate has fallen upon Mr. Arthur Cates, who has further been elected by his colleagues as Chairman of the Board.

The Council have reappointed Mr. Thomas W. Cutler as the representative of the Institute on the Sanitary Inspectors' Examination Board.

At the Congress of the Royal Institute of Public Health, to be held at Eastbourne in July, Mr. Herbert Spurrell has consented to represent the Institute. Messrs. Alexander Graham and Edwin T. Hall will represent the Institute at the British Congress on Tuberculosis, to be held in London this year, also in July.

At the instance of Mr. Killingworth Hedges, M.Inst.C.E., and following a suggestion made by him in his paper on "The Protection of Public Buildings from Lightning," read before the Institute on April 23, 1900, the Council have aided in the formation of a "Lightning Research Committee," whose object is to tabulate information as to the destruction caused by lightning. Expert observations, exact measurements, photographs, plans, &c., will be welcomed by the Committee. Mr. John Slater and Mr. H. H. Statham represent the Council on the Committee. The other members up to the present are Major-General E. R. Festing, C.B., F.R.S., Messrs. J. Gavey, M.Inst.C.E., W. P. Goulding, F.S.I., Dr. Oliver Lodge, F.R.S., W. N. Shaw, F.R.S., A. R. Stenning, F.S.I., Arthur Vernon, F.S.I., Killingworth Hedges, M.Inst.C.E. The Council have voted a sum of 25*s.* per annum for three years towards the expenses of the Committee. Other societies are also lending financial aid to the scheme. Mr. John Slater is chairman, and Mr. G. Northover is secretary.

The Council recommend to the attention of members the Architectural Museum, Tufton-street, Westminster, which is somewhat in need of funds for purposes of repairs, maintenance of the 4,000 casts of examples of Gothic work, and the purchase, if possible, of casts of Classic and Renaissance examples. They feel that the support of the profession at large is deserved by a most valuable institution, whose foundation and maintenance have been the devoted work of a few men. The Council have decided to make the Museum an annual grant of twenty guineas, on the condition of the Council being adequately represented on the Committee of the Museum.

The question of architects' names appearing on advertisement boards has come before the Council, and they have issued a resolution which has been printed several times in the *Journal and Supplement*, and in the current *Kalendar*, to the effect that the signing of an architect's name on his building is not derogatory to the profession, but that "it is undesirable for architects to place their names on boards and hoardings in front of buildings during course of construction for purposes of self-advertisement." The Council earnestly hope that members will co-operate with them in making this resolution as effective as possible.

The Council take this opportunity of drawing attention to the needs of the Architects' Benevolent Society, and express the hope that the names of more members of the Institute will appear in the list of subscribers.

The Council are much gratified in being able to draw attention to the satisfactory financial condition of the Institute. Early this year the sum of 1,050*l.* was invested in Queensland Government Three per Cent. stock, thus bringing the total amount of the invested capital of the Institute up to 10,000*l.* A statement of income and expenditure, and balance-sheet for the year ending December 31, 1900, and an estimate of the income and expenditure of the present year are appended.

Reports of the various committees were also

submitted. The Report having been adopted, the election took place of scrutineers for the annual election of the Council and standing committees.

The following gentlemen were then elected as Fellows: Messrs. Hippolyte J. Blanc, R.C.S.A., F.S.A.Scot., Edinburgh; C. Fitzroy Doll, of London; and E. H. Sedding, Plymouth; as Associate: Mr. R. Douglas Wells, B.A., London. Mr. Lacy W. Ridge then moved the following resolution:—

"That in the opinion of this meeting it is not desirable that By-law 26 be repeatedly suspended. The Royal Institute looks to the Council to put forward each year a nomination for the Presidency in accordance with the constitution of the Institute as laid down in the by-laws."

This was withdrawn after some discussion, and the meeting terminated.

MAGAZINES AND REVIEWS.

THE *Art Journal* includes an article by Mr. Lewis F. Day on "Modern Stencilling" with illustrations of the work of one or two stencil designers who have endeavoured to extend the scope of the art by applying it to portraits, repeat figure friezes, &c. This is done in a very clever way, but it does not convince us, and we prefer to see stencil reserved for mere pattern. Designing for stencil is, however, no doubt good practice in the art of conventional design, or reducing natural foliage, as well as representations of symbolical objects, to decorative form. A good article is contributed by Mr. A. A. Bone on "The Frieze and its Origin." The writer does not throw any new light on the origin of the frieze, but he has a good word to say in regard to its sculptural treatment. "A well-planned frieze," he observes, "has much in common with a march in music, of which rhythm, proportionate determination of phrases, and continuous sustentation of force are the characteristics"; so the frieze must be designed with the same attention to symmetry of disposition as would be necessary among a body of men marching to music, who could not so march if irregularly disposed. This is a suggestion that will bear working out.

The *Magazine of Art* contains an article on "Modern Steamship Decoration," which we know has been carried to great elaboration of late, and often in excellent taste. We must say however, that we do not approve of tiles as steamship decoration. The fact that tile decoration can be successfully applied in an ocean-going steamer may no doubt be taken as a strong practical proof of her stiffness and solidity of build, but it seems out of place; one is accustomed to think of a ship as subject to constant strain in every direction, and tiles seem too rigid a material to harmonise with our idea of a ship, wood and fibrous plaster (which latter is no doubt largely used) seem more appropriate. An article on "The Newly-discovered Frescoes at Boscoreale" gives information and illustrations in reference to the most interesting find in Roman domestic art since the unearthing of Pompeii.

The *Studio* (April 15) contains an article, written and illustrated by Mr. E. Borough Johnson, on the subject "How to Use a Lead Pencil," a practical subject on which many persons who handle lead pencils but do not know how to use them have much to learn. The advice given seems to be excellent, only we cannot agree that what the writer calls "the searching-out lines" in drawing from the figure should be left, and not rubbed out, "as they will give interest and spirit to the drawing," the right outline when found, being merely strengthened. This is a piece of cant in modern art-practice; we observe that some young architects, also, who send us sketches of detail, seem to consider that there is a kind of merit in leaving visible the incorrect lines by which they first made a bad try in curve or scroll. We call that simply slovenly workmanship. And then, too, the question might be put, ought there to be searching-out lines at all, and is not the finest practice to study the line so well before you draw it that you do it correctly without trial lines? As far as architecture is concerned, we know that sketching in ink is most valuable practice in this way, compelling the sketcher to take the whole proportions and understand the meaning of all the lines before he begins drawing them. However, the pencil is a pleasanter medium both in

actual working and in final effect, and we are glad to see a good paper on the subject.

In the *Artist* is an article by Mr. Wentworth Huyshe on the lately recovered Greek statues which have been fished from the depths of the sea. The article, however, seems to be a summary of information and opinions rather than original: the illustrations give it, however, considerable interest. An article on "Art in Picture Frames," by Mr. Aymer Vallance, is far too short for the subject, on which there is in reality a great deal to be said.

The *Architectural Review* (Boston), No. 3 of Vol. VIII., contains a short article by Mr. Lewis F. Day on "Lettering in Ornament," which is to be continued, and a long one, with a good many illustrations, on "Doorways of the Bristol Renaissance," by Mr. J. W. Dow. What is "the Bristol Renaissance"? The inquiry introduces us to the fact that there are five towns named Bristol besides our own time-honoured city—one in Nova Scotia; one in Quebec; one in Nevada, U.S.; one in New Hampshire, U.S.; and one in Rhode Island, U.S.; which last is the locality of the chapter on architecture called by the rather large title of the Bristol Renaissance. This is described as "a unique local development entirely disconnected in American architectural genealogy." The doorways figured are mostly exceedingly what would be found in English eighteenth century houses, and are interesting enough, but the title is certainly too large for the subject. The illustrations include a fine geometrical drawing of the tower at the Buffalo Exhibition (Mr. J. G. Howard, architect); a fine erection of its class, both in general design and detail.

The *Edinburgh Review* includes an article on "Woodcuts and the Illustration of Books" apropos of the exhibition at South Kensington, but which does not throw much new light on the subject.

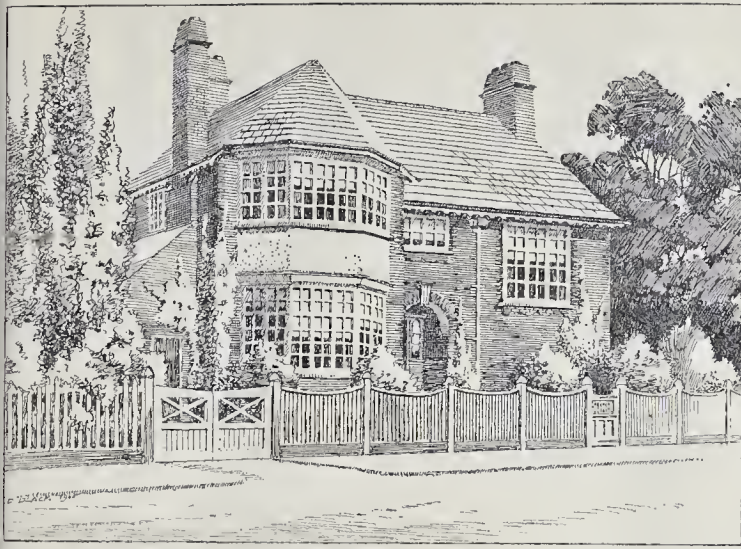
The *Quarterly* has an article on "The Housing Question," partly historical. As far as it deals with the present state of things, the tendency of the article is to recommend business methods of working. The author speaks strongly, among other things, against the unreasonable demands which are made on railway companies to run workmen's trains at a financial loss, especially on the part of the London County Council. "No sound economic development can take place by this method of extorting service." An article on "The Game of Billiards" will probably interest a good many of our readers; and the number contains also what is perhaps the best and most interesting article on the late Sovereign which has appeared in any magazine.

The *Monthly Review* contains an article by Professor Waldstein on the recently recovered Greek sculptures. He directs attention especially to the "bronze Hermes" and to the marble sculpture which has been called the "crouching warrior." The importance of these works Professor Waldstein considers to be partly due to the fact that they are separate sculptures, made for their own sake as sculpture, and not as decorations to a building. The article should be read by those interested in Greek art.

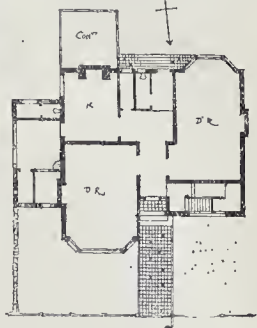
Scribner, under "The Field of Art," gives an interesting description, with illustrations, of the work of the Sèvres manufactory at the recent Paris Exhibition, considered as an example of French architectural decoration.

Harper contains an article by M. Benjamin-Constant on "My Portraits" which it is needless to say is of considerable interest. More especially are the following remarks on his portrait of Queen Victoria, now at the Academy of interest at the present moment; they explain to us what the author was aiming at:—

"Recalling my visit to the House of Lords one beautiful day in autumn, when the yellowish rays of the westerling sun shone through the glass windows, I seemed to see one of those interiors of a golden obscurity in which Rembrandt so loved to place his figures; and I beheld as in a vision . . . the Sovereign, seated on the throne of England, motionless, her gaze deep in retrospection, almost hieratic—the idol of her subjects. I saw this Queen, in gorgeous robes covered with jewels, and bathed in the rays of the setting sun from head to foot. With this sublime apparition in my mind, I wished to express, as it were, an entire reign. . . . I returned, then, to London for my preparatory work in sketches with sunshine effects, and the weather conditions were favourable too, although it was in March, towards the close of the wintry season. I saw once more the throne in the same clear-obscuré (light and shade), in the same golden



"FAIRMEDE"
NEW SOUTHGATE
ERECTED FOR
ALAN HEDDERLEY
ARTHUR STRATTON
ARIBA. ARCHITECT.



vapour, so sumptuously poetic, which enraptured my vision on my original visit to the House of Lords.

The studies finished, I went back to Paris, realising thoroughly what I had to do, but not knowing positively if I should succeed. I started my work then, having before me a small, very exact likeness of the Queen's face. This, be it understood, was not the copy in enamel of a nose, of a mouth, that I was going to execute, but the portrait of the Queen of England, the Empress of India, seated a little in the background, in a semi-obscurely traversed diagonally by two or three rays of the declining sun, like bars of gold, which attached themselves to the carved corners of the Royal stall, or lighted up the red tapestry hangings. In short, I proposed to myself to express, so to speak, a synthesis of resemblance; a resemblance, moreover, rather moral than physical; almost a historical vision.

The *Century* contains two descriptive articles on ancient cities, one on "The Deserted Capital of Rajputana," the other on the ruins and remains of Priene, described as "a recovered city of Alexander the Great." Unfortunately they both appear to be the work of popular writers rather than learned archaeologists. Some trouble, however, has been expended in illustrating them.

"Dunvegan Castle" is the subject of an illustrated article in the *Pall Mall Magazine*.

The *Church Builder* (quarterly) contains No. 7 of a series of articles by Mr. J. T. Mickelthwaite on "Church furniture and arrangement," this one dealing with "The Basilican plan." The tendency of the article is to the effect that there is no basilican plan, and that if there is we can find it without going out of the range of mediæval churches, since at St. Peter's, Mancroft (Norwich), St. Margaret's, Lynn, and St. Margaret's, Westminster, and a hundred other places, we have the unbroken nave and aisles from end to end, just as in the early Greek and Roman churches. There are other qualities besides plan, however, in the type of church called Basilican, a title which defines what is meant well enough, whether it be regarded as historically correct or not. The protest in the article is that of a mediævalist church architect, in fact.

Feildon's Magazine contains articles on "Motor Cabs in Paris" and on "Electrical Ties," the latter a continuation of the essay by Mr. Brew commenced in a previous number.

The *Essex Review* (quarterly) contains a long article, with a good many illustrations, on "Some Interesting Essex Brasses."

In *Knowledge* the interesting investigation as to the height and action of ocean waves, by Mr. Vaughan Cornish, is continued, accompanied by a diagram showing the relation between what are recognised as waves are the larger and longer undulations on the surface, which occur on a vast scale in the Pacific especially, the normal "waves" being com-

paratively smaller undulations on the surface of the greater and slower ones.

We have received also the *Revue Générale* and the *Gentleman's Magazine*.

FAIRMEDE, NEW SOUTHGATE.

THE illustration shows a small country house erected in the Bowes-road, New Southgate. The disposition of the plan was dictated by the nature of the site and the points of the compass. It is very simply treated throughout; the walling is of local brick with slightly dark-toned quoins, &c.; the roofs are covered with green Westmorland slates, and the paintwork generally is white. The contract was carried out by Messrs. Brown & Sweetland, of New Southgate, under the superintendence of the architect, Mr. Arthur Stratton, of London.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Licenses.—On the recommendation of the Finance Committee it was agreed to lend the Battersea Borough Council 2,460*l.* for the erection of a sawmill, the Stepney Borough Council 5,160*l.* for street-lighting purposes, the Woolwich Borough Council 2,170*l.* for the erection of a library, and the Poplar Borough Council 6,040*l.* for the erection of a wall.

Improvements.—On the recommendation of the Improvements Committee it was agreed that the estimate of 10,000*l.*, submitted by the Finance Committee be approved; and that, subject to the Council of the Metropolitan Borough of Wandsworth agreeing to contribute one-third of the net cost, and subject to the terms of an agreement to be prepared by the solicitor, the offer of Messrs. Holloway Brothers to surrender their leasehold interest in the part of the Magdalen College estate required for the widening of Garratt-lane, Wandsworth, to 54 ft. be accepted.

Theatres.—On the recommendation of the Theatres and Music Halls Committee the following applications were agreed to on certain conditions:—

London Exhibitions.—Model of a Boer farm, to consist of a cottage of five rooms, constructed of studding and plaster slabs (Mr. A. O. Collard).

London Exhibitions.—Addition to the southeast side of the Quadrant Restaurant (Mr. A. O. Collard).

Lyceum Theatre.—Certain structural alterations.

Tramways.—The Highways Committee reported as follows:—

"We have to report, for the information of the

Council, that the Board of Trade has, by letter dated April 24, 1901, signified its approval, required by the London County Tramways (Electrical Power) Act, 1900, of the plans, submitted in accordance with the resolution passed by the Council on November 27 last, showing the rail and substructure proposed to be used in the reconstruction, for electrical traction, of the tramways between (a) Westminster Bridge and Upper Tooting-road, (b) Kennington Park-road (at its junction with Kennington-road) and the Blackfriars terminus, and (c) St. George's Circus and the terminus in Waterloo-road. The Board has also approved, provisionally, the proposed system of traction so far as the use of a pressure not exceeding 500 volts is concerned, such approval being subject, however, to any requirements which may be considered necessary on the inspection of the completed works. The Board has asked to be furnished with further details of a technical character with regard to the supply of energy at a pressure of 6,500 volts to the proposed sub-station at Balham; and we have given instructions for these further details to be prepared and submitted as soon as possible for the approval of the Board.

The Council will be able after June 29, 1901, to give notice to the South London Tramways Company of intention to purchase, under Section 43 of the Tramways Act, 1870, the tramways authorised by the South London Tramways (Extensions) Act, 1880. These tramways are about 4½ miles in length, and are situated in York-road, North-street, St. John's Hill, Lavender Hill, Wandsworth-road, Falcon-road, Queen's-road, and Victoria-road. They constitute rather more than one-third of the company's system, various other parts of which will become purchasable in 1902 and 1903 respectively. The Council, it will be remembered, served a notice upon this company last year to purchase the portion of its undertaking which then came under the operation of the section above referred to."

Having transacted other business, the Council adjourned.

SANITARY INSPECTORS' ASSOCIATION: SANITATION IN SOUTH AFRICA.

AT the monthly meeting of the Sanitary Inspectors' Association, held at the Carpenters' Hall, E.C., on Saturday evening, a paper was read prepared by Mr. J. S. Dunn, Sanitary Inspector to the Bulawayo Council, on "Sanitation in South Africa." Mr. W. H. Grigg, the Chairman of the Association, presided.

In the absence of Mr. Dunn the paper was read by Mr. O. C. Hills. In the course of the paper the author described South Africa as a country without sanitation. With regard to Cape Town, although it was making advances, it would be some time before it could be favourably compared with towns of similar population and importance at home. The roads and footpaths and gutters required much attention. The subsoil in places must be frightfully polluted from slop and kitchen waer. Much slum property existed; rents were high even in these quarters, and conse-

quently overcrowding was prevalent. Passing on to discuss the condition of Bulawayo, he pointed out that that township was just over six years old, and stands where Lobengula's cornfields formerly flourished. Practically no attempt had been made to construct proper roads and footpaths, and he (the writer of the paper) left it to the imagination of those who had not visited the spot to picture the condition of things after a downpour of five or six days' duration. The population was now about 4,000, and the pail system was in vogue for the removal of night soil, the work being performed nightly, an advantage which no other South African town enjoyed to his knowledge. The work was carried out departmentally, clean disinfected buckets being provided about twice a week. The night soil was conveyed to the municipal depositing site, about three miles from town, and emptied into trenches, which were then prepared for tree planting. Rubbish, slop water, dead horses, &c., were also removed by the Council. At present the system in vogue for rubbish removal was not quite a happy one. They endeavoured to persuade occupiers to enter into monthly contracts with the Council, when their rubbish was removed periodically for a stated amount, but as this system was not compulsory, they could not always bring the public to see things from their point of view; consequently large and offensive accumulations were not an unknown fact. The removal of slop water was a burning question at Bulawayo, as it was in the majority of South African towns. Let them imagine a town with only surface drainage. Refuse water could not flow down the street gutters, removal by slop wagon was costly, and only compulsory in the event of a nuisance arising; consequently the usual way of disposing of the water was by scattering it over the stands. Thus the subsoil was being polluted wholesale, and the purity of the well waters endangered. There was a water supply, but owing to the fluctuating quantity of water available, its variable quality, and the high tariff charged, the demands on the company were not great. Moreover, as over 350 wells had been sunk in the township, frequently a costly undertaking, their use would not be abandoned for trifling reasons. It was regrettable that more care was not exercised in selecting positions and in their construction, so as to guard against possible pollution.

Too frequently one found that every opportunity was offered for the entry of surface water and foreign matters at the mouth of the well, and that contamination by percolation from closets, dustbins, stables, washing water, &c., was easily accomplished. However, the Council realised that well water could not be regarded as a permanent supply, and the necessity of obtaining a wholesome and abundant one for the people was now receiving their earnest consideration. In the meantime all doubtful well waters would be carefully analysed. With the exception of typhoid fever they had been remarkably free from infectious disease. It was well they had, for an outbreak would find them unprepared. Notification was compulsory, but there the law as regarded infectious diseases practically ended.

Dealing with the slaughter site, he described it as unsatisfactory in the extreme, simply consisting of poles erected about a mile from the township. The blood soaked into the ground, the water supply was totally inadequate, carcasses were exposed to the weather; pigs, dogs, and Kafirs acted as scavengers. The stench was unbearable. The Council had, however, after two years' deliberation, at last decided to erect municipal abattoirs. There were other steps being taken which would make Bulawayo a more pleasant place to live in. Some of the recently erected permanent buildings would be a credit to any European capital. Touching upon the condition of colonial villages, he regretted that the defects were very glaring. He concluded by expressing the opinion that had South Africa been in a better condition as regards sanitation, probably the sickness and mortality among our troops in the present campaign would have been greatly lessened. He feared that with the present sanitation preventive disease would take a long time to stamp out.

Mr. Hills (City of London) said the facts given had come as a revelation to many of them. He certainly did not know that so many defects characterised sanitation in South Africa. Now that a large number of Englishmen were being appointed to posts better results would arise.

Mr. Young (Battersea) was surprised to hear

of the condition of things in Cape Town, and trusted that before long the attention of the British public would be called to the matter.

Mr. E. Tidman, on the authority of a military officer, confirmed the statements as to the condition of Cape Town.

A vote of thanks was passed to Mr. Dunn for his paper, and to Mr. Hills for reading it.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.—

Lines of Frontage and Projections.

Wandsworth.—The retention of a tool-shed in the garden at the rear of The Beeches, No. 21, Melrose-road, Wandsworth, abutting on Avenue-road (Dr. G. G. Sharp).—Consent.

Wandsworth.—School buildings on the east side of Garratt-lane, Wandsworth, at the corner of Swaffield-road (Messrs. Lansdell & Harrison for the Guardians of the Wandsworth and Clapham Union).—Consent.

Hackney, North.—Houses, with shops on the ground floor, on the forecourt of No. 50, Green-lanes, Stoke Newington (Mr. J. Phoenix for Mr. F. W. Britton).—Consent.

Wandsworth.—Thirteen one-story shops on the east side of Balham High-road, between No. 207 and Elmfield-road (Messrs. Dale & Gadsdon for Mr. J. Stone).—Consent.

Width of Way.

Deptford.—Gates and a boundary wall at the entrance to the chemical works, on the east side of Creek-street, Deptford (Messrs. F. C. Hills & Co.).—Consent.

Hoxton.—A two-story warehouse at the rear of No. 110, New North-road, Hoxton, at less than the prescribed distance from the centre of Salisbury-street (Mr. R. Matthews).—Consent.

Deviations from Certified Plans; and Projections.

Strand.—Deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of No. 20, Cockspur-street, Charing Cross, with projecting oriel windows and turrets (Mr. W. Woodward for the International Sleeping Car and Express Trains Company).—Consent.

Deviations from Certified Plans.

Lambeth, North.—Deviations from the plans certified by the District Surveyor so far as relates to the proposed rebuilding of No. 22, Westminster Bridge-road, Lambeth, at the corner of York-road (Mr. F. Waghorn for the Camden Brewery Company).—Consent.

Lines of Frontage, Width of Way and Space at Rear.

Walworth.—That the application of Messrs. Spalding & Spalding for an extension of the period within which the erection of a building, to be used as a working men's club, on the east side of Walworth-road, Walworth, at the corner of York-street, was required to be commenced and completed, be granted.—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

NEW WING, EYE AND EAR HOSPITAL, TUNBRIDGE WELLS.—A new wing has been added to this hospital; it was opened on the 30th ult. Mr. H. M. Caley was the hon. architect.

OPEN SPACES.—Walpole Park, at Ealing, has been purchased from Sir Spencer Walpole by the Ealing District Council for 40,000l., and converted for purposes of a public recreation ground; the property, including the mansion and grounds of about thirty-one acres, was occupied by the late Right Hon. S. H. Walpole, Secretary of State, and the offer to the District Council was made in December, 1898, subject to the life-interest in the property of Miss Frederica Elizabeth Perceval (youngest daughter of Spencer Perceval), who died at a greatly advanced age in May last year.—The Hampstead Borough Council have appointed a special committee to consider and report upon the project of the School Board for London to acquire part of the site of the old mansion with its grounds, known as the Grange, at Kilburn, for the erection of a Board School; the Board's proposal has aroused considerable opposition in the locality, where it is desired to preserve the property as an open space.—The Corporation of the City of London have ratified a code of by-laws for the regulation and use of the garden space within Finsbury-circus, which they have taken over for the benefit of the public, in pursuance of an Act passed in that behalf last year.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting of this Institute was held on the 1st inst., Mr. E. W. Brabrook, C.B., V.P., in the chair. Mr. E. Green, in the absence of the author, read a paper by Mr. A. R. Whiteway, M.A., on "The Pyrenean Neighbour, or the Vicinal System in the Western Pyrenees." Mr. Whiteway, long resident at Pau, having given attention to and mastered the difficult Bearnais tongue, has followed up his advantage by a close examination and study of the local archives, from which he has gathered many notes on local customs, and especially this vicinal system, hitherto a neglected and unwritten chapter in the history of social institutions.—Mr. H. Longden read a paper on "Cast-iron" and dealt principally with cast-iron firebricks, examples and photographs of which were exhibited. One specimen shown bore the Royal Arms of James I, 1604; another of "Richard Lenard, founder at Bred Fournis, 1636," showed a portrait of Richard Lenard standing in the middle of the implements of his trade and of the products of his foundry; a Puritan book showed the sacrifice of Isaac, the Patriarch, Jacob blessing the sons of Joseph, Joseph being put into the pit, and Jacob being informed of the death of Joseph; another showed the Rose surmounted by the Crown, 1650; and a very fine one "Fairfax Councillor, 1640," gave the general on horseback finely modelled. A note was made of a fire-back belonging to Mr. Edmund James, where an earlier model of St. George and the Dragon was surmounted by the legend "Cursius" and "Nil Desperandum, 1650," and placed at the side of the figure. It was thought that this back had a Royalist significance in contrast to the Fairfax back. A rubbing of a grave slab of Anne Forster, 1591, was shown and a description of how the model was prepared for casting was given. A casting, lent by Mr. E. James, of the Baptism of our Lord, apparently of the sixteenth century, was also exhibited. It is not a fireback, but has evidently been fitted to other work. The Almighty and the Holy Spirit, each surrounded by a nimbus, are in the upper part of the panel, and St. John Baptist and our Lord are in the lower part. Mr. James Hilton exhibited a pair of German iron carings of very delicate casting, originally made to replace similar articles of gold and jewellery which were given up by the ladies of Germany at the time of the Napoleonic wars. In the discussion on this paper Mr. R. G. Rice gave many quotations from Sussex wills in which the names of ironfounders were mentioned, and references made to iron grave slabs, &c.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The annual general meeting was held on the 1st inst., Mr. C. H. Compton, J.P., in the chair. An interesting account of the exploration of a tumulus in Buckenham Fields, Norfolk, was contributed by Lord Amherst of Hackney, and read by the Rev. H. J. D. Astley. The tumulus is one of two large tumuli on Lord Amherst's property, situated about seven miles north of Brandon, and was opened by him in August last in the presence of a large party interested and experienced in such operations, including Prof. McKenny Hughes, Prof. Mahaffy, and others. The work proved somewhat heavier than had been anticipated owing to the tumulus having been thrown up on the brow of the slope so that it depended on its lower side more than had been foreseen. It is often very difficult to find the exact centre of a sepulchral mound, as the additions, whether of earth or stones, would be originally larger on the side where it was most easy to procure material, and, in after ages, the crumbling down of the mound would be greater where it was helped by the slope of the ground. In this case the centre of the mound, as obtained by measurement from its inferred marginal outline, did not coincide with the highest point, nor did the position of the only interment met with agree with either. The mound was divided by the explorers into quadrants, separate parties undertaking each, so as to insure that nothing could be overlooked, and the whole face was dug clean down to the undisturbed sand and gravel. Notwithstanding the care exercised no secondary or contemporary marginal interment was found. In the north-west quadrant an old horseshoe without catkins was met with, raising the hope that Saxon remains might be near, and in the south-west quadrant some bones of domestic animals, suggesting

relics of the funeral feast, but nothing came of them. In the north-east quadrant, however, in the afternoon of the last day's work, a skeleton was uncovered lying in a posture which indicated a British interment. After Professor Hughes and others of the party had left a further interesting discovery was made, consisting of a circle of charred earth and ashes, some 6 in. in width, forming an almost complete ring round the skeleton at a distance of about 2 ft. from it. As the body did not occur in the centre nor at the bottom of the mound, but at a great depth near the centre, it seems quite possible that it may be a contemporary burial of secondary importance, and that the principal interment may still be concealed under the deepest part of the mound not yet explored.—Mr. T. Cato Worsfold gave an interesting description, based upon his own research and observations, of the Porta Nigra, or Great Gate of Trèves. After discussing the origin and foundation of the grand old town, whose rise to eminence gained for it from the poet Ausonius the title of "Rome beyond the Alps," Mr. Worsfold described the numerous and splendid relics of the Roman occupation which remain to the present time, and then explained the construction of the Porta Nigra and the theories put forward as to the date of its erection, which he himself assigns to the commencement of the fourth century, when it became necessary to erect defences against the rush of Rome's Teutonic foes. From this period the history of the Porta Nigra was traced onward through the Middle Ages until its final restoration in 1876. Mr. Blashill, the Rev. Evelyn White, Mr. Gould, Mr. S. W. Kershaw, and others took part in the discussion which followed the papers.

ARCHITECTURAL SOCIETIES.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.—A general meeting of members was held at the rooms of the Institute, 20, Lincoln-place, Dublin, on the 2nd inst. The chair was taken by Mr. J. Rawson Carroll, F.R.I.B.A. The following resolution was proposed by Mr. J. J. O'Callaghan, seconded by Mr. F. Franklin, and carried unanimously:—"That the draft by-laws of the Ulster Society of Architects be approved of, and that the Council of this Institute be authorised to make the necessary alterations in the by-laws of the Institute to make them conform with those of the Ulster Society." The following candidates for membership were declared duly elected:—William A. Scott, London; Jerome O'Connell, Curragh Camp; Henry Seaver, Belfast; and Anthony Thomas Jackson, Belfast. The proceedings then terminated.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on the 6th inst., Mr. Charles Mason, President, in the chair, a paper was read on "The Treatment of Low-grade Iron Ores for the Smelting Furnace" by Mr. Thomas B. Grierson, M.Inst.C.E. The author first alluded to the serious condition of the British iron trade owing to foreign competition, which condition the great American Steel Combine had served to accentuate. One of the difficulties against which Great Britain had to contend in its export trade was, he said, the foreign protective tariffs. The want of more advanced appliances and processes in British steelworks was given as one reason for our being unable to compete successfully with foreign producers, particularly Americans, who were more to be feared as trade rivals than other competitors. American steel-makers, as well as those of other countries, had been adopting new machinery and new methods, whilst we had been standing still. The author then pointed out that the remedy for this unsatisfactory condition of matters was for the British steelmaker to set his house in order, firstly, by adopting improved plant and methods of production, and, secondly, by utilising low-grade iron ores, of which there is an almost unlimited supply. Low-grade ores were mainly of two kinds, magnetic iron ores and magnetic iron sand. The low-grade ores would not pay to smelt in lumps, but required to be pulverised and concentrated. In that condition, however, they, as well as the iron sand, are unsuited for the blast furnace. It was, therefore, necessary to combine them

with some cohesive material, and to make them into briquettes. This preparation had been effected by heat alone, but that method was only successful with ores containing silicates. Lime formed a good binding material, whilst concentrates had been variously mixed with tar, pitch, and bituminous coal, and pressed into briquettes and coked. The matter resolved itself into the mechanical reduction and concentration of the poor ore, the incorporation of the concentrates with a suitable coherent, and the conversion of the mass into briquettes. The author described Mr. Edison's process, respecting which there has recently been a considerable amount of discussion in the Press. This process consists in crushing the ores in a mill and in concentrating them. The concentrates are mixed with certain ingredients which are not publicly known, and the mass is then pressed into briquettes and baked. The briquettes were stated by the author to be of a porous nature, and unsuited to the requirements of the blast furnace. Mr. R. F. Strong had also invented a method of treating low-grade iron ores. The ore was first reduced to powder, and concentrated by any suitable appliances. The concentrates were mixed with binding materials in the proportion of 85 per cent. of concentrates, 5 per cent. of powdered quicklime, and 10 per cent. of pyroigneous tar. The mass was pressed into briquettes, which were immediately ready for use in the blast furnace, not requiring to be baked like Edison's. Strong's briquettes had been proved to be specially adapted by their density and compactness for the blast furnace. For countries where charcoal fuel is used, that ingredient is incorporated in the briquettes. The author recommended that blast furnaces should be erected at the low-grade iron ore deposits, and the pig-iron made there. The cost of transport to steel works would thus be that of the metallic products of the ore, the matrix being left behind in the form of slag.

BOOKS RECEIVED.

QUANTITIES. VOL. I. ROAD MAKING AND SEWER CONSTRUCTION. By J. Bartlett. (St. Bride's Press.)

BUILDING TRADES IN WARSAW.

REPORTING on the trade and agriculture in Poland and Lithuania for the year 1900, Mr. Murray, British Consul-General, writes under date April 5.—The financial crisis has had a very bad effect on the building trades throughout this district, and especially at Warsaw, where also the large number of houses built in the last two or three years has had a similar effect; 904 plans for new houses for rebuilding were presented to the Government Architect for confirmation in 1898, and 846 plans in 1899, whilst in 1900 only 501 plans were submitted. Again, in 1898 the builders declared their intention of carrying out 512 of the buildings; in 1899, when the crisis began to be felt, the number dropped to 294, and in 1900 to 230. Taking the time required for the construction of a house at two years, this would mean that work was done on 800 houses in 1899, on 500 houses in 1900, and will be on 370 houses in 1901. On the other hand, the amount of the work done on public and block buildings increased in 1900 as much as that on private houses diminished. For instance, there were the Polytechnicum, which is to cost 300,000*l.*; the new building for the "Child Jesus" Hospital, also to cost 300,000*l.*; the "Kossia" Insurance building, to cost 110,000*l.*; the Hotel Bristol, the Fine Arts Exhibition, the Philharmonic Hall, the block of shops in the Diaga-street (60,000*l.*), the block of buildings being built in the Smolna, and others. In several of these constructions use is being made of materials which are new here; for instance, in the Hotel Bristol the new here; for instance, in the Polytechnicum some are made of mixed iron and cement on the ceilings. The Matray system, in the Polytechnicum some are Matray and others Klein, whilst in several other buildings they are on the Monier system. In almost all buildings use is still made of the unhealthy and heavy clay plaster instead of plaster of Paris. Lifts are beginning to be introduced, but unfortunately no control is exercised over their construction, so accidents are to be feared. An improvement that is becoming general is the arrangement of windows to open inwards, and this, it is to be hoped, will diminish the number of accidents to servants while cleaning them. Steam heating for the whole of a house is coming into vogue. It is usually carried out by means of a central installation with a low pressure of steam. Electric light has also been installed in several houses, but it is found necessary to have accumulators and also to find lodgers who wish it, which is very few do at Warsaw on account of the expense. Although there is very little building of dwelling-

houses likely to be done in Warsaw itself in 1901, a good many villas and houses are to be built in the suburbs, which become more and more popular, rent there being much lower, and the increased number of steam and other tram lines render communication easier. Several factories are to be built in the suburbs of Czysta and Wawer. The villas and dwelling-houses will be mostly at Czysta, Willanow, and along the lines of the steam tramways. 1900 was a bad year for all suppliers of materials for building, as they had arranged their output on an estimate in accordance with the amount of building done in 1897-98-99, so that there was a considerable over-production, especially of bricks. Many brickfields had to close altogether; others sold their stocks of bricks, which they had prepared at the beginning of the season, at any price they could get, the price per 1,000 falling from 2*l.* 5*s.* in 1899 to 1*l.* 1*s.* in 1900, which barely covered the cost. Glazed tiles for stoves were also in small demand, and two works closed altogether, after existing only three years. Cement works also did badly in 1900, and few of them paid any dividend. The demand was so much smaller than in previous years, that they had to diminish production and lower prices. The cement works, however, form a strong syndicate, which already had an arrangement with the German works that neither should export cement; strong in the knowledge of which they have now decided to raise prices 25 per cent. in 1901, as there will be no competition from abroad. The price of cement in 1900 was 6*s.* per cask wholesale and 8*s.* per single barrel. This price was only maintained thanks to a considerable demand in Russia. Had the works depended on local demand alone, they might just as well have closed. Lime did better than any other material used for building, and prices were maintained. The lowest prices paid were 1*s.* 2*d.* to 1*s.* 1*d.* per cwt. for first quality and 1*s.* 1*d.* to 1*s.* 0*d.* per cwt. for second quality. The price of plaster of Paris was 2*s.* 3*d.* to 2*s.* 3*d.* per cwt. The manufacture of mineral colours has been carried on in the kingdom of Poland for about thirty-five years. The first factory established was one which still exists at Grodzisk, near Warsaw. There are also factories at Winnica, near Warsaw, and at Koniki, Szaryszko, Radom, and Bendzin. The colours manufactured consist of various ochres, umbers, English reds, and various kinds of black (bistre). The washing process has only been introduced at one factory, all the others employing the dry process. The clay is dried, burnt to the proper hue, ground by millstones and sifted through silk muslin. The various ochres employed are found in the country, the best qualities being found in the Konecki district of the Government of Radom, and in the Bendzin district of the Government of Piotrkoff. Iron oxides (refuse of iron workings) are imported chiefly from the United Kingdom, "Cassel brown" and various kinds of bistre from Germany. The colour supply having increased until there was an over-production, there is now a great stagnation in the trade. No other kinds of colours except those mentioned are made in Poland.

ELECTRIC LIGHTING IN LEEDS.—The City Council of Leeds have made application to the Local Government Board for sanction to borrow 500,000*l.* for purposes of electric lighting, and this application formed the subject of a public inquiry held at the Municipal Buildings on the 18th ult., by Mr. H. H. Law, M.Inst.C.E., an inspector appointed by the Board. The Council's scheme includes the extension of the present works in Whitehall-road, the installation of engines and the dynamos, the introduction of new plant, and the laying of mains in various parts of the city. The Town Clerk (Mr. W. J. Ieaves) gave the inspector a brief sketch of the history of the electric lighting undertaking, which was acquired by the Corporation in December, 1898, by purchase from the House-to-House Electricity Company. The number of units sold in the year ended December 31, 1893, was 130,000; in the year ended March 20, 1901, it had increased to 2,520,414, which was an increase of over 500,000, or more than 25 per cent. on the pre-1893 year. The number of lamps in 1893 was 10,647; this year it was 132,293, an increase of 26,000 on last year. The gross revenue had gone up from 1,001*l.* in 1893, to 43,624*l.* in the year ended March 20, last, which latter amount showed an increase of 7,404*l.* on the revenue of the previous year. The working expenses had, of course, also increased, beginning with 2,700*l.* in 1893, and being this year 15,770*l.* The profit this year was 3,600*l.* greater than last year. They started at December 31, 1893, with a year. They started at December 31, 1893, with a gross profit of 1,205*l.*, and this year it was 20,884*l.*, but naturally there was also an increase upon interest and sinking fund, that increase being altogether about 5,000*l.* Mr. Charles France (of Messrs. Mines & France, Bradford), the architect for the new works in Whitehall-road, explained the scheme. The works are really an extension of the present buildings in Whitehall-road, and are being erected on adjoining land which the Corporation acquired by purchase from the company who formerly owned the electric supply works. The area of that land is 5,700 yards, practically the whole of which will be covered by buildings, within which there will be provided all the plant requisite to the growing demands of the undertaking.

Illustrations.

RAILWAY STATION, HOWRAH,
CALCUTTA.

ROR some long time past the present terminus of the East Indian Railway has, owing to the growth of the line and its consequent increase of traffic, been found inadequate, and the advent of the Bengal and Nagpur Railway determined the directors to rebuild their station so that it should accommodate both railways.

Howrah is a suburb of Calcutta, across the Hooghly (about three-quarters of a mile broad at that part), connected with it by means of a swing bridge.

The new station, with its length along the riverside, is adjacent to the bridge and faces Calcutta. The disposition of the ground floor is shown on the plan; the first floor is devoted to the offices of the superintendent of traffic, telegraphs, &c., and the third floor contains the residences of the officials connected with the railways.

The station consists of two blocks connected on the first floor by means of a bridge of 47 ft. span, and the façade measures about 600 ft. in total length, with return wings 200 ft. odd in depth.

The main (Chandmarce) road from Calcutta over the bridge passes on the north side of the station, and the tower—with a clock—is placed at the angle to inform the traveller, as he drives to catch his train, of the amount of time available for him. The third-class waiting halls are open the full (40 ft.) height. The discrepancy between the perspective and the plan is due to the fact that the former was made almost at the outset, whilst the plan represents the building as it is to be executed.

HALSEY RICARDO.

NORTH LONDON CREMATORIUM.

This building is to occupy a site near the Finchley-road, where some acres of hillside are to be judiciously planted by Mr. William Robinson. This ground, or garden, will not be dotted like a cemetery with tombstones, as by the scheme a cloister will form the "columbaria" for urns, and will bear the various monuments and memorials on its walls.

The building will be entered from a forecourt, with the chapel on one side, and the superintendent's cottage, office, &c., on the other side.

The chapel has a carriage porch. It has two retiring or waiting rooms, with separate exits for mourning parties who may be using the building simultaneously.

Four furnaces are provided, as these burn themselves out quickly and want frequent reneving. The furnace flue forms a centre to the belfry, from which, however, no smoke should issue, there being a second small furnace in the throat of the flue for the consumption of smoke or gas.

This brick building is broadly and simply treated in the round-arched style of Lombardy—the low-pitched roofs being of Italian tiles.

The small domed building in the architects' drawing shows a family mausoleum, or columbaria. It is thought that separate bays of the cloister will be secured by families, and their monuments of stone, marble, or bronze will have the benefit of shelter.

The architects are Messrs. Ernest George & Yeates, and the drawing is now in the Royal Academy Exhibition. It is the only drawing they exhibit this year.

THE REBUILDING OF THE ROYAL
INFIRMARY, GLASGOW.

THE competition for the rebuilding of the Glasgow Royal Infirmary was a limited one, ten architects or firms of architects being invited to compete. Seven of these were Scotch practitioners, and three were from London. Dr. Rowland Anderson was the assessor. The scheme was one of great interest, involving, as it did, the pulling down entirely of the present infirmary, and erecting upon the site a thoroughly up-to-date building in arrangement and appointments. The accommodation required for the reconstructed buildings was 650 beds, divided as follows—viz., 225 on the medical side, 300 on the surgical, and 100 for special diseases. These were to be distributed into five medical services of forty-five beds each = 225; six

surgical services of fifty beds = 300; and about 100 beds for diseases of women, throat and nose, skin, venereal, burn, isolation, and emergency cases. The site, a very fine one, situate close to Glasgow Cathedral, was very restricted in its extent, necessitating the adoption by all competitors of six stories of wards generally throughout. The author of the design we illustrate this week endeavoured to avoid the parallel arrangement of pavilions, the area of the site not permitting of sufficient distances between the six-storied pavilions; hence the nature of the general arrangement of the scheme. Each ward suite has its zone of aeration, the administration of the whole establishment practically being concentrated in the central longitudinal block. It being desired to utilise the southern portion of the establishment in the commemoration of the Queen's Diamond Jubilee, due effect was given by the projecting circular ward, with its twin towers and colonnade upon the ground floor. A fresh departure in the new hospital is the provision of some seven or eight operating-theatres, each visiting surgeon having his own separate theatre, out-patients' room, test-room, laboratory, &c. In a similar manner separate lecture-theatres have been provided for five visiting physicians. Each service throughout had suitable apartments for the house surgeon or physician, as the case may be—in each case closely adjoining the respective services. The author provided in the basement a special arrangement of medicinal baths, derived from the best German examples; whilst attention was paid to the now necessary electrical department and a gymnasium for orthopedic cases. Liberal accommodation was provided as required for dining and billiard rooms for the resident doctors; mess and sitting room accommodation for the nurses and the male and female servants. An important provision comprised the working and store rooms of the following departments—linen-rooms, dressmaking, mattresses, and the Dorcas. The general kitchen and its accessories were placed in what in the front is a basement story, but which at the back stands clear, the tradesmen's entrance being through an archway under the easternmost sanitary towers of the male surgical wards suite.

A committee-room, superintendent's and matron's suites of offices, journal-room, and a chapel, were provided in the central administrative block. The present laundry was in this scheme simply extended, with new boilers, incinerator, and disinfecter.

The ear, throat, and nose, emergency, and isolation wards are of two stories only, above the ground floor. The exterior design has been kept somewhat severe in character, and its style and architectural proportions are in contrast, so as not to suffer by the juxtaposition of Scotland's chief cathedral.

The estimated and complete cost of this scheme was stated by its author, Mr. A. Hessel Tiltman, of London, to be 297,765*l*.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

18.—SLOP-SINKS AND URINALS.

SLOP-SINKS.—In small houses the water-closet generally serves also as slop-hopper, and is well adapted for the purpose of removing the slops, but affords no facilities for cleansing the bedroom utensils. There is also a danger of the enamel being damaged by the pails, and a further objection is the risk of splashing either on to the floor or the seat. As already pointed out, some siphonic closets are set in action by a painful of slops, and are therefore unsatisfactory unless fitted with an automatic arrangement for starting the flushing cistern. Valve-closets are also unsuitable for the purpose, as the slops may overflow if the handle of the closet is not pulled at the moment of emptying. When the water-closet is intended to serve as a slop-hopper it ought to have a wide rim sloping inwards, or to be fitted with a "slop-top," in order to reduce the risk of splashing. If the closet is enclosed with woodwork, a square slop-top ought to be fixed to the basin under the hinged seat, as otherwise the floor is certain to become very foul.

A proper slop-hopper or sink is, however, a great convenience, and a suitable number must

be provided in all large houses, and also in hotels, hospitals, asylums, boarding schools, and other important buildings where a large quantity of slops may be produced. The term "slop-hopper" is often applied to fittings for the simple removal of slops, and the term "slop-sink" to those provided with hot and cold water in addition to the flushing apparatus. The simple slop-hopper is in shape very similar to a wash-down pedestal closet; a movable grate of porcelain or brass (the latter being the better material) is often fitted in to prevent brushes and cloths being carried into the waste-pipe and drain, and the apparatus is all the better if the sides and back are raised to prevent splashing. The material may be enamelled cast iron, or some kind of glazed pottery. A wood rim is sometimes fixed along the front to prevent the enamel being chipped by pails.

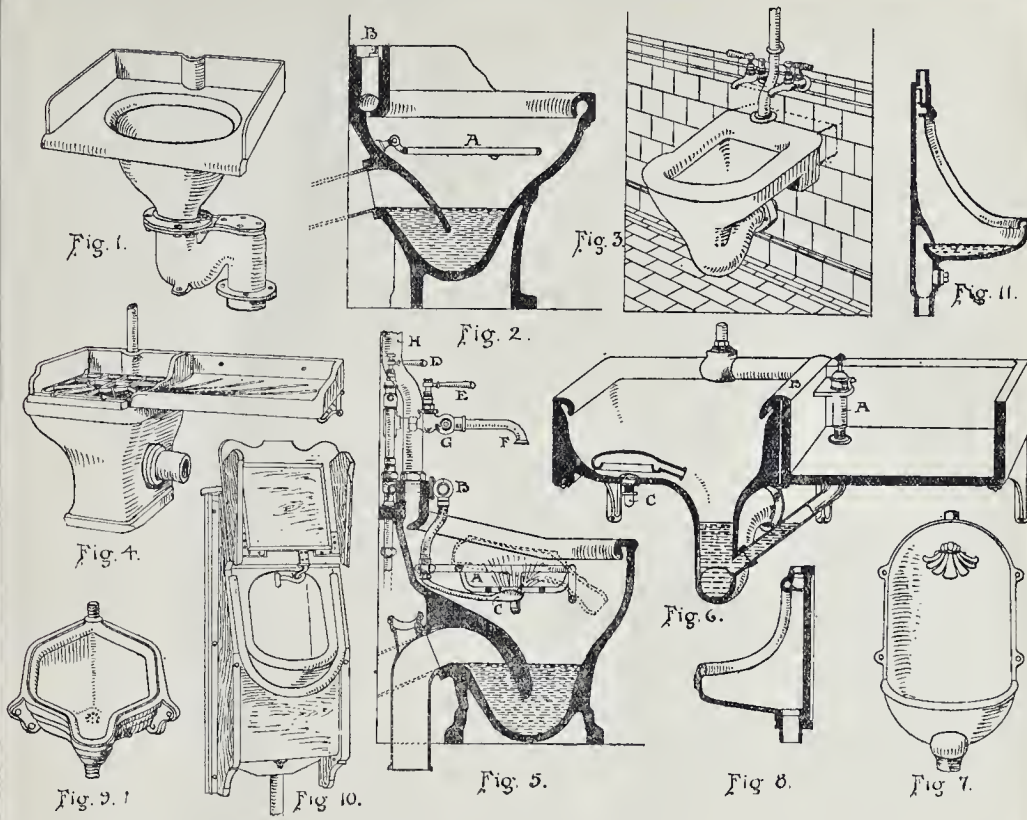
The slop-hopper shown in fig. 1 is of cast iron, and may be painted, vitreous-enamelled, or white porcelain-enamelled. Plain painting cannot be recommended. The hopper is of the ordinary short-hopper water-closet type, but with a square top and raised back and sides. A flushing rim is provided with a nozzle for connexion to the flush-pipe of a cistern or to a simple supply-pipe. The trap may be of S or P shape. Similar hoppers are made of enamelled fireclay. This form of hopper is, however, objectionable in several respects. The large exposed surface of the hopper renders cleansing more difficult, and the outlet of the S-trap is not above the floor. The pedestal slop-hopper (fig. 2) is of better design. The back part is raised to reduce the risk of splashing, the basin and trap are in one piece of enamelled fireclay, the outlet of the trap is above the floor and clear of the wall, and a hinged brass grate, A, is fitted in the hopper to form a stand for jugs and other utensils which are being washed or filled from the draw-off taps projecting from the wall above. In addition to these taps, a flushing cistern, having a capacity of 2 gallons or 3 gallons, is connected to the nozzle at B, and operated in the same manner as a water-closet flushing cistern. Fig. 3 shows a "bracket" or "projector" slop-hopper on the same general lines, but with the back part of the top inclined upwards towards the wall instead of the raised back and sides.

Adam's slop-sink (fig. 4) has a flat back, so that the pottery fits closely against the wall; the trap is of P-shape, with the outlet in the side of the pedestal. The hopper has a raised back and side, flushing rim, and hinged brass grating, and can be fitted with a bed-pan flushing nozzle for hospital use. At one side an enamelled draining slab is fixed to receive the washed utensils.

Many slop-hoppers are fixed without flushing rims and cisterns, but cannot be recommended. Urine is a very foul liquid, and slop-hoppers are as difficult to keep clean as water-closets, and ought therefore to be flushed in a similar manner. The joints at the outlets of the hoppers ought also to be designed on similar lines. Slate or marble skirtings are sometimes used instead of pottery, and may be supported on iron brackets or on a framework of wood, but the latter is not a suitable material.

In slop-sinks for hospitals provision must be made for washing bed-pans. The "Victorian" slop-sink (fig. 5) is a good example. The hopper and trap are in one piece of glazed ware. A brass grating, A, covered with impervious vulcanite, is hinged at B in such a manner that it can be swung upwards and held by a catch when not required. The grating is fitted with a rose and jet, C, for washing bed-pans, one of these being shown by dotted lines. Water is supplied to the rose and jet by means of two taps (for hot and cold water respectively), one of which is shown at D. Two other taps, E, supply water to the draw-off nozzle, F, which is swivel-jointed at G, so that it can be turned up out of the way. The sink is flushed from a cistern containing 2 gallons or 3 gallons, the down-pipe being shown at H; the flush can be started in the usual way, or by pressing a button. The nozzle for receiving the flush-pipe is vertical, thus facilitating the formation of the joint. The outlet of the sink is well above the floor and clear of the wall, and is flanged to receive the soil-pipe branch, which is of cast iron, glass-enamelled inside, with a socket for the trap-ventilation pipe.

A scalding, or washing-up, sink is often fixed at the side of the slop-sink, and forms a most useful adjunct. The example given in



Illustrations to Student's Column.

Fig. 6 is known as the "Middlesex," and consists of a sloop-sink with rectangular top, flushing-rim, and P-trap in one piece of enamelled fireclay, and a washing-up sink of similar material with standing waste, A, and overlap joint, B. A rose, C, can be fitted in the sloop-sink for the purpose of washing bed-pans. The waste outlet of the washing-up sink is connected to the trap of the sloop-hopper as shown. The sinks are supported on three enamelled cast-iron brackets, and a three-gallon cistern is provided for flushing the hopper, in addition to the hot and cold supply taps. An "Inserta" wood rim can be fixed along the front of each sink, after the manner illustrated in figs. 1 and 2, page 142, and has the advantage of protecting the enamel and of reducing the risk of breaking pottery utensils.

Urinals.—In ordinary houses special urinals are not required, as the water-closets serve the necessary purpose, provided that they are not enclosed with woodwork. A sloop-top renders the closet more serviceable, but is not indispensable. In large houses (especially those containing billiard and smoke rooms), and in hotels, schools, railway stations, and other places where men congregate, urinals are, however, a necessity. They may be broadly divided into three classes—basins, troughs, and stalls. When basins and troughs are used the adjacent walls and floors ought to be of impervious materials, such as glazed tiles or glazed fireclay slabs, as a certain amount of splashing is almost unavoidable. All urinals ought to be provided with some kind of flushing apparatus, as they are extremely difficult to keep clean. Urine soon forms a coat of "fur" even on the smoothest surfaces, if these are not thoroughly flushed. The objectionable smell of urinals is greatly reduced, if not entirely removed, by keeping a piece of soda in each basin, trough, or stall.

Urinal basins may be of enamelled cast-iron or of glazed pottery, the latter being the better material. Fig. 7 shows a "cradle-back" basin of cast-iron with fan-spreader inlet. It is obvious that the flush cannot reach every part

of the basin. As in water-closets and sloop-sinks, a flushing rim is essential for the proper cleansing of the fitting; such a rim is shown in section in fig. 8, which represents a "flat-back" porcelain basin of good shape. Urinal basins may be "wide-fronted," as in fig. 7, or "lipped," as in fig. 9. The lipped urinal was introduced with the idea that the projecting lip would prevent urine dropping on to the floor, but it has not fulfilled the inventor's expectations; men are afraid of soiling their clothes if they stand sufficiently close for the lip to serve the purpose for which it was intended. The urinal shown in fig. 9 is designed for fixing in the angle of a room.

One of the difficulties connected with urinal basins is that the users seldom take the trouble to flush them. When the water companies have no regulations to the contrary, a stop-cock is often fixed in the supply-pipe immediately above the fitting, but comparatively few people take the trouble to turn it. In some places where the basins are largely used the water is kept constantly running throughout the day, but this is a practice to which water companies object. A supply of water during the usage of the fitting is, however, most important, as it cleanses the basin and at the same time dilutes the urine, and thus reduces the risk of "fur" being formed in the trap and waste-pipe. The apparatus shown in fig. 10 is a simple contrivance for effecting this object. The basin is fixed in a wooden framework and is covered, when not in use, by a lid hinged at the top. The raising of the lid opens the supply-valve, and the water continues to run until the valve is closed by shutting the lid. There is more woodwork around the fitting than is desirable, and the part below the basin might with advantage be omitted. Other methods of flushing urinals will be considered in the next chapter.

Folding urinals, generally of enamelled cast-iron, are sometimes fixed in offices and houses, but are apt to become very foul on account of the difficulty of flushing the surfaces of the

containers into which the urine falls when the basins are lifted up.

The ordinary urinal basin has a grating in the bottom or back with a nozzle for connexion to the waste-pipe, and does not retain water. This cannot be regarded as an entirely satisfactory fitting, and basins are sometimes made to retain a quantity of water, either by forming a trap in one piece with the basin after the manner of a wash-down closet, or by raising the waste-pipe so as to form a trap behind the basin. A trapped basin was designed by Mr. Hellyer some years ago, but the outlet of the P trap was behind the basin, and the joint was therefore in the wall and difficult to inspect and repair. This objection has been removed in Tylor's urinal basin (fig. 11), but the seal of the trap is very small and the outlet appears to be very contracted, and therefore difficult to clean.

Urinal basins are generally fixed with brass screws, but sometimes lugs are provided at the back for fitting into slots in the wall-slab. As pottery often warps in the kiln, the backs of good fittings are ground to a level surface after burning, so that they will fit closely against the wall.

PRIMITIVE METHODIST CHURCH, TREDEGAR, SOUTH WALES.—The memorial-stones of a new chapel to be erected for the Primitive Methodist connexion at Tredegar were laid recently. The new chapel, which will be erected in Commerce-road, is to replace the old building in Mount-street. The new edifice, which is being erected by Mr. Rees Edwards, Tredegar, from plans prepared by Mr. S. Williams, Tredegar, will provide accommodation for between 600 and 700, and will cost about 1,700*l.*

DECORATION, ST. AUGUSTINE'S CHURCH, DUBLIN.—The decoration and carving of the Chapel of the Sacred Heart, St. Augustine's Church, Thomas-street, which has been in progress for some time past, has just been completed. The whole of the work has been carried out from the designs of Mr. George C. Ashlin, R.H.A., Dublin, and the supervision of the work for him was done by Mr. Thomas A. Coleman.

GENERAL BUILDING NEWS.

CHURCH, HETTON-LE-HOLE, DURHAM.—A new church has been erected at Hetton-le-Hole. The building, which stands on the site of the old one, was designed by Mr. S. Piper, architect, of Newcastle-on-Tyne, and is of the Early English style, and will seat 800 people. One of its chief features is the large chancel, in which, on either side, there are three rows of carved oak stalls, the work of Mr. R. Hedley, of Newcastle-on-Tyne. On the right of the chancel, looking east, is a side chapel capable of accommodating from sixty to seventy people, in the east end of which is a stained-glass window in memory of the late Mr. Nicholas Wood, which occupied a position in the old church. The other stained-glass window, in memory of the first rector of Hetton (the Rev. J. S. Nichol), also removed from the old church, has been enlarged and placed in the south transept. The aisles of the church are narrow, with lofty arches and stone pillars. At the west end of the church there is a baptistry, formed by an arcade of three arches, with octagonal pillars, over which is a five-light window. In the north-west corner the choir vestry has been placed. The chancel is paved with black and white marble tiles, the work of Messrs. Borrordale Brothers, Sunderland. Within the sanctuary the tiling is entirely white. At the east end is the clergy vestry. The font, supplied by Messrs. Jones & Willis, London, is of Caen stone, with four marble columns. The pulpit is of carved oak, by Mr. R. Hedley, of Newcastle. All the aisles are laid with wood block in the herring-bone pattern. The builder was Mr. W. Sparrow.

CHURCH OF ST. PETER, NEWTON-IN-MAKERFIELD, LANCASHIRE.—A new tower and two porches have just been erected at the parish church of St. Peter, Newton-le-Willows. Mr. A. W. Smith, architect, of Manchester, prepared the plans for the tower and porches. The base of the tower, which rises to an altitude of 77 ft., and also in the porches, the walls are covered with an oak dado, the doors being of the same kind of wood and carved, whilst a wood block floor has been introduced. In the belfry it is proposed to have a peal of bells, and provision is also made for fixing a clock on the outside. The contractor for the work is Mr. Peter Fiekle, of St. Helens.

REBUILDING OF ST. PAUL'S, THORNTON HEATH.—The memorial-stone of the first portion of the new church of St. Paul, Thornton Heath, was laid recently. About 6,500*l.* is to be spent on this work, which is being undertaken from the completed plans of the whole building drawn by Mr. R. Philip Day, the diocesan architect. The present instalment consists of the nave and aisles on the western side, from the extreme end of which the baptistry will be built out. The open timbered roof, tiled outside, will reach a height of 70 ft. Messrs. D. Stewart & Sons, of Wallington, are the builders.

NEW AISLE, ST. SAVIOUR'S CHURCH, DUBLIN.—On the 28th ult., the new aisle, which has been erected in St. Saviour's Church, Dominick-street, was opened. The new aisle, the erection of which was commenced in September, 1899, consists of seven bays, making a total length of 124 ft. and width of 20 ft. inside on the south side of the church, and is built in Bath stone with clustered piers and moulded caps and bases, supporting segmental moulded arches which divide it from the old aisle. There are likewise moulded cross arches dividing each bay of the aisle. The groining is in pitch pine, with moulded ribs and carved bosses at the intersections. The floor is laid with pitch pine block-flooring and the passage at the sides with tiles. Each bay is lighted with a three-light tracery window, while the end window, where the altar stands, is filled with stained glass, which will be repeated in the side windows. The exterior of the aisle is built in ashlars limestone, with cut stone dressings, and finished with gables and foliated crosses. The new aisle is to be dedicated to St. Joseph, and it is the intention to erect an altar which will be in keeping with the other altars in the church. The communion railing is in Carrara marble, moulded and carved with columns in coloured marble. This work has been executed by Mr. Ryan, while the contract for the new aisle was carried out by Mr. James Donovan, from the designs and under the supervision of Mr. G. C. Ashlin, R.A., architect, Dublin.

CHURCH, OCKLYNGE, EASTBOURNE.—A new church is being built at Ocklynge from plans by Mr. G. E. S. Streetfield.

BAPTIST CHURCH, BURY-ROAD, HASLINGDEN, LANCASHIRE.—This church was opened recently for public worship, and will accommodate on the ground floor 328, in the galleries 279, and in the choir twenty, total 627, or a mixed congregation of over 700 persons. There are four vestries attached, also a choir vestry adjoining the organ-chamber, which is in the form of a semi-circular apse, with the choir in front of organ and behind the pulpit. The seating is pitch pine, varnished; gallery fronts, pitch pine with carved oak panels, pulpit of oak with carved panels. The ceiling is of plaster, curved in centre with open timber trusses. The walls are of rock-faced stone, with ashlar stone dressings. The cost is over 4,000*l.* The architects are Messrs. George Baines and Reginald Palmer Baines, London. The schools adjoining were

erected previously from plans by the same architects.

NEW WING, HOLY INNOCENTS' CHURCH, HAMMERSMITH.—The new west wing of this church was dedicated on the 27th ult. The first portion of the church was consecrated some ten years ago. The second portion has now been completed at a cost of 5,000*l.* The building is of red bricks, with Bath stone dressings. Messrs. Faulkner & Sons were the builders, the architect having been Mr. James Brooks.

NEW SYNAGOGUE, FINSBURY PARK.—The foundation stone of a new synagogue in Princess-road, Finsbury Park, was laid on the 1st inst. by Mr. F. D. Mocatta. The new building, which, when completed, will be the northernmost synagogue of the metropolis, takes the place of temporary premises in Portland-road. When completed it will provide accommodation on the ground floor for 199 gentlemen, and in the galleries for 144 ladies. Mr. Delissa Joseph is the architect, and the work of construction is being carried out by Messrs. L. Whitehead & Co.

COTTAGES, YATTON.—Two cottages have recently been erected on the Claverham House Estate, Yatton. The ground floor contains living-room, kitchen, and wash-house with outhouse, and the first floor three bedrooms. The total cost was 400*l.* for the pair. Messrs. Needham, of Yatton, were the builders; and Mr. C. A. Rowley, of Bristol, the architect.

Y.M.C.A. NEW PREMISES, BURTON.—The memorial stones of these buildings have just been laid. The new premises extend from High-street to Friars-walk, with a frontage the whole depth along Whitehurst's-passage. The main entrance will be in High-street, which leads from the entrance passage into a large entrance-hall, about 20 ft. square, and from this entrance-hall access may be obtained to all parts of the premises. On the ground floor will be found a waiting room, to be utilised for the general secretary's office. Beyond this room is a large recreation and tea room, boiler-house for the heating-apparatus, and a lavatory block with bath-room, &c. Connected from the entrance-hall by means of a glass-covered corridor is the gymnasium, the length of which is 48 ft., the width 20 ft., and the height to ceiling 19 ft. This room will be provided with a glazed brick dado and a boarded ceiling. The remainder of the ground to Friars-walk is occupied by a lecture-hall (82 ft. long, 30 ft. wide, and 26 ft. high to the ceiling). This hall will have a wood block floor sloping from the entrance end to the platform, and will have a wooden dado 6 ft. high; the roof will be of heavy pitchpine timbers, resting on carved stone corbels, and all the woodwork is to be stained and varnished. Entrance and egress may be obtained by means of five doorways in this hall, and all the doors are made to open outwards. In connection with this hall are gentlemen's and ladies' cloak-rooms with lavatories attached. On the first floor, which is approached by a stone staircase, is provided a reading-room, with an open timbered roof, and the various other rooms consist of committee-rooms, classrooms, photographic studio and dark-room, with rooms for the caretaker. In addition to the portion of the premises occupied by the Y.M.C.A., other portions of the premises have been let off into suites of offices and a café restaurant, and in connection with the restaurant a basement kitchen is provided. The premises will be lighted by electricity. The general contractor for the work is Mr. R. Kershaw, and his sub-contractors are Mr. A. Geary (for the joinery), Messrs. T. Turner & Son (for the plumbing and painting), and Mr. T. Biddulph (for the plastering and concrete floors). The architect is Mr. Thos. Jenkins.

BUILDING NOTES, ABERDEEN.—It has now been found that the operations in connection with the extension of Aberdeen Joint Passenger Railway Station will not be proceeded with for about two or three years from this date.—A day or two ago the United Free Presbytery of Aberdeen approved of the plans of the new church at the corner of King-street and Urquhart-road for St. Clement-street Free Church congregation, who have now succeeded in selling their old place of worship. Messrs. D. & J. K. Macmillan, Aberdeen, are architects for the new station, which will cost about 7,000*l.*—The master slaters of Aberdeen have formed an association which will enable them to receive scales of measurement and schedules from the Aberdeen Society of Architects for enabling them to estimate for new buildings.—A new theatre is to be built in Rosemount-viaduct for the Robert Arthur's Theatre Company.—The following tenders for new Corporation Electric Station at Dee village have been accepted:—Six boilers, Babcock & Wilcox, 10,175*l.*; joiner work, Geo. Jamieson, Aberdeen, 2,190*l.*; plumber work, Walter Simpson, Aberdeen, 698*l.*; plaster work, Adam & Co., Aberdeen, 499*l.*; slater work, Adam & Co., Aberdeen, 350*l.*

FLATS, HAMPSHIRE, N.W.—"The Chimes," West End-lane, built from designs by Pugin, for the late E. Herbert, R.A., has just been demolished, and blocks of residential flats are to be erected upon the site, approached by a garden court, with carriage-drive, and will be called "King's-gardens," Hampstead. The building will contain 380 rooms, divided into fifty self-contained flats, carrying from six to eight rooms approached by halls and four electric lifts. The halls, bathrooms, and water-

closets will be laid with mosaic. The principal doors and decorative woodwork will be in Spanish mabogany, with marble steps to entrance doorways. The fronts will be carried out with cherry red bricks, gauged arches and aprons, with freestone dressings, and roof covered with green slates. The buildings are to be carried out from designs and under the direction of Messrs. Palgrave & Co., architects, Victoria-street, S.W., and Messrs. Collins & Co. are the contractors.

HOSPITAL, RICHMOND, IRELAND.—The new Richmond Surgical Hospital was opened recently by the Lord Lieutenant of Ireland. The architects of the new building were Messrs. Carroll & Batchelor. The site was previously occupied by old dairy yards and dilapidated buildings, and lies fronting North Brunswick-street, the northern flank being on the avenue leading to the Whitworth and Hardwicke Hospitals and the North Dublin Union. The hospital consists of a central special block containing entrance hall and matron's and resident surgeons' offices and sitting-rooms, and visiting surgeons' consulting-rooms, &c., to the right, and to the left the boardroom, children's wards, &c. The central block is connected by wings to the east and west pavilions for women and men respectively. From the west pavilion a corridor leads to the Whitworth Hospital and also to the administration block and nurses' home, which latter buildings are situated on the left-hand side of this corridor. The principal entrance gates are in North Brunswick-street, and a separate entrance for stores is provided from the same street by the side of the old Richmond Hospital. The road leads direct to the delivery yard, which adjoins the kitchen department. The new power house and steam laundry abut on this road at the rear of the old hospital. The new hospital contains accommodation for eighty-four beds, but the scheme provides for a considerable extension in the future. The buildings are faced with bricks, with dressings of Ruabon red terra cotta, whilst the roofs are covered with Cumberland green slates, with the exception of the southern towers and ventilating flues, which are covered with copper. One of the principal features in the hospital is the operating theatre block. It is approached from the main corridor, the two doors from which open into a waiting corridor or lobby, with windows at each end for the purpose of providing cross ventilation, and thus cutting off this block from the rest of the hospital. The room for administering anaesthetics adjoins this lobby, and is fitted with sinks and lavatory basins, and also an apparatus for sterilising instruments and other utensils in use in the operating theatre. This room communicates directly with the operating theatre, which is one story high, about 29 ft. long by 23 ft. wide. It is lighted by three north windows, and also from the roof. The wall lining in this room, as well as that in the adjoining rooms, is of white glazed bricks, relieved by bands of blue. The floor is of dark red adamantium tiles, and the gallery for the accommodation of students is of white Sicilian marble. The theatre is warmed and ventilated on the Plenum system. Adjoining the theatre is a smaller room for operations. The wards generally (with the exception of those for children) are of one size—viz., 60 ft. by 25 ft., and 14 ft. high—each providing accommodation for fourteen patients with a cubic space of 1,500 ft. per bed. Attached to each ward are a ward kitchen fitted with a small range, sink, plate rack, &c., a sister's room, linen-room, and separation-room for two patients. At the south end of each ward are provided, in projecting towers separated from the wards by cross ventilated lobbies, a bathroom and lavatories, &c. Between these projecting towers are arranged sun verandahs for the use of the convalescent patients, communicating with the wards by means of French windows. The new kitchen, sculleries, and stores have been designed to serve the whole group of hospitals. Near the hydraulic lift in the basement is situated the admission, waiting-room, and bathroom for newly-admitted patients, also the stores for patients' clothes, &c. The corridors and staircases throughout the hospital and nurses' home are heated by steam radiators. The wards are warmed by open fires in octagonal faience chimney breasts, which are carried through the centre of the wards. The nurses' home can now accommodate thirty-one nurses, principally in dormitories and associated rooms, and is provided with dining and sitting rooms, scullery, and bathroom and sanitary accommodation.

BISHOP OTTER COLLEGE, CHICHESTER.—A new wing has just been added to the Bishop Otter Memorial College, Chichester. The wing is 120 ft. long, 28 ft. wide, and 54 ft. high from basement floor to ridge. On the basement there are two boilers, one for the general heating of the building and the other for supplying hot water for domestic purposes, bathrooms, and lavatories. The ground floor of the building comprises a hall, 58 ft. 4 in. long, 25 ft. 11 in. wide, and 15 ft. high; senior students' classroom, 31 ft. long and 25 ft. wide; corridor, 40 ft. long by 6 ft. wide; seniors' and juniors' cloakroom, storeroom, laboratory, and range of sanitary offices. The hall has emergency doors opening outwards. The first floor consists of fifteen sleeping dormitories for students, one mistress's room, a library 31 ft. by 25 ft., two bathrooms, wardrobe accommodation, &c. On the second floor there are

twenty-four similar sleeping dormitories, one mistress's room, bathrooms, boxrooms, and other necessary conveniences. Access to the new wing is obtained from the old part of the college by means of wide archways while there are fireproof staircases. In connexion with the work for extending the college, alterations have also been carried out in the old part of the building, where several rooms have been thrown into one so as to make a dining hall capable of seating at table a company numbering over 100 persons. In another part several small rooms have been made into one classroom for junior students. The total cost will fall little short of 4,000. The architect was Mr. Gordon P. G. Hills, and the builder was Mr. J. O. Holt.

BOARD SCHOOL, NEWPORT, MON.—The Clytha School, intended to serve the Risca-road district of Newport, was opened recently. The new school building is in the Renaissance style, and has been constructed of red brick with freestone dressing. The school will be a mixed one, and is intended to accommodate 350 scholars. There is a large central hall, and five classrooms leading from it. Separate rooms have been provided for the head-master and assistant teachers. The building is one-storied, and the floor is laid with wood blocks. An asphalted playground has been provided. The total cost has been 3,500. Messrs. Habershon, Fawcner, & Groves were the architects, and Mr. Charles Locke was the builder.

SANITARY AND ENGINEERING NEWS.

RESERVOIR, BRISTOL WATERWORKS.—Particulars are given in the Chamber of Commerce report with regard to the new Yeo reservoir of the Bristol Water Works Company, which is approaching completion and is the sixth largest in Great Britain. The water area of the reservoir, when full, is approximately 450 acres, and the reservoir when filled will hold about 1,700,000,000 gallons. The reservoir has been formed by constructing an earthen embankment of dam across the valley of the Yeo at a point close to Blagdon. The embankment at its highest point is 43 ft. above the surface of the ground, and the greatest depth of water in the reservoir will be 37 ft. The length of the embankment is 530 yds., and over the top a carriage road has been constructed to take the place of a portion of the old road to Blagdon, which is submerged in the bed of the reservoir. The length of the lake formed by the reservoir will be about 1½ miles. The water is taken from the reservoir by means of a brick tunnel 10 ft. in diameter, the water being controlled by large outlet valves. Compensation water has to be provided for the river, and to regulate this water special apparatus has been designed and constructed. The bywash (for the purpose of discharging flood waters), 360 yds. long and 188 ft. wide at the crest of the weir, has been constructed in masonry, lately with Cheddar and Thertington stone, pitching, set in cement, while Forest of Dean stone has been largely used in a bridge constructed over the bywash, and in other ornamental parts of the work. The weir stones and the pitching of the inner slopes of the embankment are of Dartmoor granite. At the Rickford spring an ornamental gauge house has been erected for measuring the water, which is conveyed to the reservoir by means of a 27-in. cast-iron pipe, the distance being about two miles. Similar arrangements have been made with regard to the Langford spring, and the distance in this case to the reservoir is nearly 3½ miles, the pipe being 21 in. in diameter. Adjoining the reservoir, engine and boiler houses are in course of erection for the reception of pumping machinery, by means of which the water will be pumped through cast-iron pipes to the existing North Hill tunnel of the Bristol Waterworks Company, a distance of about five miles. The engines are of the compound rotative beam type. The engineers are Messrs. T. & C. Hawksley.

SOUTHWARK AND VAUXHALL WATERWORKS.—On the 30th ult. a party of engineers and other gentlemen interested in waterworks visited Harpington Court, at the invitation of the Southwark and Vauxhall Water Company, to inspect the company's new works and cut the sod of the large storage reservoir about to be constructed at Walton. The party included Sir John Aird, M.P., Professor Frankland, Professor T. E. Thorpe, and Mr. J. W. Restler, engineer to the company. The works inspected include a new pumping station, new filter beds and storage reservoirs. The pumping station consists of three triple expansion engines of 780-h.p. each, built by the North-Eastern Marine Engineering Company, of Sunderland. The boiler-house contains ten Babcock & Wilcox water-tube boilers (land type). The engine-house is lighted by electric arc lamps, the power for which is supplied by one of the patent double triple-expansion engines invented by Mr. Restler. The six new filter beds have just been put in, and were charged with sand for the first time in the presence of the visitors, who watched the process of admitting the river water. The filtering layer is 3 ft. 6 in. in depth, of which 2 ft. 6 in. is sand. Seven additional filter beds are under construction in the same area. A new instrument for measuring and recording the rate of filtration on the principle of the waste water meter is on

trial at the waterworks. After inspecting the filters the party proceeded to the large storage reservoirs, which hold 300 million gallons, and were built in 1890. They form two sheets of water nearly half a mile in length. Before their completion the storage capacity of the company was only 90 million gallons. It is now intended to increase it to 1,512 million gallons by means of a new large reservoir, to be built by Messrs. John Aird & Son, and to hold 1,076 million gallons.

PROPOSED BRIDGE, BARDONKEY FORD, PERTH.—Plans have been passed by the Blairgowrie District Committee of Perth County Council of a bridge which it is proposed to construct over the River Isla at Bardonkey Ford. Messrs. Blyth & Westland, of Edinburgh, are the engineers.

SEWAGE WORKS, SHERINGTON, BUCKS.—A Local Government Inquiry was held by Colonel J. T. Marsh, R.E., at Sherington as to the application for a loan for works of main sewerage and sewage disposal, per plans by Messrs. D. Balfour & Son, of London and Newcastle. The scheme comprises laying of 3½ miles of main sewers with manholes, flushing arrangements, also the construction of bacterial tanks and the laying-out of the land, the effluent from which will discharge into the River Ouse.

ENGINEERING FEAT AT NEWCASTLE.—An interesting engineering feat was accomplished on the Tyne on the 5th inst., when the spans and roadway of the bridge connecting Newcastle and Gateshead, which had been built 4 ft. 6 in. to the eastward of the position they were ultimately to occupy, were moved over into place. An old bridge existed, and the new bridge has been built on precisely the same site the old one occupied. The traffic has yet gone on uninterrupted. The new piers were built round about the old ones, and the roadway and spans were erected a little above and 4 ft. 6 in. to one side of the old roadway and spans, a temporary footway meanwhile being provided for foot passengers. The old piers were then taken away and the new roadway was lowered to its proper level, and on the 5th inst. moved over into its permanent position. This was accomplished by means of hydraulic jacks. The total weight of the bridge was 1,600 tons, and the jacks were capable of exerting a pressure of 1,500 lbs. to the square inch. The bridge is built of steel, and is of the American type, but the details are strictly in accordance with the best English practice. There are four spans, two of 252 ft. and each of the others 170 ft. The total length of the bridge and its approaches is 1,900 ft. Its total weight is 2,000 tons. The bridge is carried on cylinder foundations, each 8 ft. in diameter, and sunk to a depth of 50 ft. below low water. There are four cylinders to each pier. The engineers of the bridge are Messrs. Sandeman & Moncrieff, of Newcastle, and the builders are Sir William Arroll & Co., Glasgow.—*Times*.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Lowe's Patent Sanitary Pipe Joint Syndicate, Limited, Dashwood House, New Broad-street, E.C., have recently effected an arrangement with Messrs. J. Stiff & Sons, of Lambeth, whereby this firm become their sole agents for London and suburbs.

—In consequence of the death of the senior partner, the late Mr. Alderman Samuel Green, the firm of Messrs. Green & Son, Auctioneers, &c., St. Swift's-lane, E.C., will be carried on by his sons and partners, Mr. E. Horace Green, F.S.I., and Mr. Fred. A. Green, F.S.I., under the old name of Green & Son. The "Property Register and Mortgage List" (founded in 1853) will be published monthly, as hitherto.

ELECTRIC LIGHTING, BURY.—Mr. W. O. E. Meade King, M.Inst.C.E., opened an inquiry recently in the Guildhall, Bury St. Edmunds, the Town Council having applied to the Local Government Board for sanction to borrow 12,000l. for the purposes of electric lighting. The Mayor (Mr. T. Shillito), the Town Clerk (Mr. C. E. Salmon), the Borough Surveyor (Mr. J. C. Smith), the Assistant Electrical Engineer (Mr. Grefg), the Borough Accountant (Mr. J. H. Wakefield), and several members of the Council attended.

GASWORKS, PERTH.—The new gasworks which the Corporation of Perth has erected at Friarton were opened on the 26th ult. The following is a list of the contractors.—Excavator, brickwork, &c., Mr. T. D. Jamieson, Baillieston, near Glasgow; carpenter and joiner work, Mr. William McQuibban, Perth; slater work, Messrs. William Brand & Son, Broxbroth; plumber work, Mr. J. MacLeish, Perth; plaster work, Mr. Alexander McRitchie, Dundee; painter and glazier work, Messrs. G. R. Douglas & Son, Perth; iron and steel roofing, railway girders and tank, Messrs. H. Balfour & Co., Limited, Leven, Fife; retort bench, brick and iron work, elevator, coal breaker, floor and charging machinery, Messrs. West's Gas Improvement Company, Limited, Manchester; condensers and purifiers, Messrs. Clapham Brothers, Keighley, Yorks; exhausters and engines, Messrs. Bryan, Donkin, & Clench, Limited, London; station meter, gauges, &c., Messrs. John Milne & Son, Limited, Edinburgh; sulphate plant, Messrs. R. & J. Dempster, Limited, Manchester; boiler and heater, Messrs. Babcock & Wilcox, Rostrevor.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—The annual meeting of this Association will be held at Birkenhead on July 9, 10, 11, and 12. A number of interesting papers will be presented for discussion, and a lecture on "Rainfall" will be delivered by Mr. Plummer, the Astronomer to the Dock Board. Visits are also being arranged to various waterworks and other places of interest in the vicinity.

HOUSING, HAMMERSMITH.—At a meeting of the Hammersmith Borough Council on Wednesday evening the question of providing housing accommodation for the working classes was discussed at considerable length. The Works Committee had been considering as to the advisability of erecting tenements on the Council's land near the Electricity Station, Fulham Palace-road, having a frontage of 109 ft. 6 in. in Yeldham-road. They had had before them plans prepared by the Borough Surveyor, in which provision was made for three double buildings of eight tenements each—equal to twenty-four tenements in all—of which twelve consist of three rooms each, and twelve of four rooms. It had been feared by some of the members that an old water-course, known as the "Black Bull Ditch" was in close proximity to the land, but the Borough Surveyor found that the ditch would not interfere with the foundations of the buildings. Ultimately the Council decided that the plans prepared by the Surveyor be approved, and that instructions be given for carrying out the scheme under the provisions of Part III. of the Housing of the Working Classes Act, 1890, subject to the approval of the Local Government Board.

BUILDING SOCIETIES.—Mr. E. W. Brabcock, C.B., F.S.A., Chief Registrar of Friendly Societies, has just made his report for the year 1900 of the proceedings of the registrars under the Building Societies Acts. He states that seventy-three unincorporated societies—that is, Benefit Building Societies which were certified under the Act of 1850 before December 31, 1856, and have not yet been incorporated under the Acts of 1874 to 1894—still remain on the register. The number of members was returned as 21,771, or 809 for each society stating the number of its members. The total receipts of these incorporated societies during the financial year were 19,421,075l. or 303,468l. for each society stating the amount of its receipts, being nearly thirty-seven times the average of the incorporated societies; but this is accounted for by the exceptional case of a society in London (the Birkbeck) the receipts of which are returned as 17,857,620l. If that society were omitted the average income of the other societies falls to 21,831l. This interesting group of old societies, all of which have existed more than forty-four years, increased its business during the year 1899 in every respect. They are all English, there being no unincorporated societies in Wales, Scotland or Ireland. Five societies that had formerly been unincorporated obtained certificates of incorporation in the year 1900. Thirteen new societies were incorporated in the same period in England and Wales and one in Scotland. There are now 2,160 societies on the register in England and Wales, 136 in Scotland, and sixty-five in Ireland. In all three parts of the United Kingdom the Societies increased their capital and mortgage balances during the year. The number of members belonging to the societies in the year 1899 was 550,531 in England, 36,831 in Scotland, and 15,619 in Ireland—total, 602,981. The aggregate receipts during the financial year were: England, 36,928,231l.; Scotland, 609,248l.; Ireland, 487,099l.—total, 38,025,368l. The liabilities at the close of the financial year were (for England): To holders of shares, 31,136,804l.; to depositors and other creditors, 22,082,097l.; undivided profit, 3,263,777l.; total, 56,482,688l. (For Scotland): To holders of shares, 1,322,680l.; to depositors and other creditors, 262,959l.; undivided profit, 112,190l.; total, 1,697,829l. (For Ireland): To holders of shares, 646,720l.; to depositors and other creditors, 235,395l.; undivided profit, 71,137l.; total, 953,268l. In the assets were (for England): Balance due on mortgage, 43,140,631l.; other assets, 14,987,048l.; balance deficit, 354,909l.; total, 58,482,688l. (For Scotland): Balance due on mortgage, 1,547,375l.; other assets, 148,851l.; balance deficit, 1,603l.; total, 1,697,829l. (For Ireland):—Balance due on mortgage, 865,413l.; other assets, 87,190l.; balance deficit, 6657l.; total, 953,268l. As compared with the previous year (1898), there are shown (1) an increase in liabilities to shareholders of 499,771l.; (2) an increase in liabilities to depositors of 1,046,811l.; (3) an increase in undivided profits of 112,991l.; (4) an increase in balances due on mortgage of 1,104,411l.; (5) an increase in other assets of 659,123l.; and (6) a decrease in balances and deficit of 103,975l. It thus appears (comments Mr. Brabcock in his summing-up) that more than 58 millions of money has been received by building societies in the year, and that their capital or accumulated capital is more than 60 millions, of which 75 per cent. is in mortgage securities. The improvement which began in 1898 has continued, and the societies have continued considerably to reduce their properties in possession.

ELECTRIC LIGHT, BRISTOL.—The annual report of the Bristol Chamber of Commerce contains an account of the progress made in the electricity department of the Corporation of Bristol. The demand during the past twelve months for elec-

trical energy for lighting, heating, and power is said to have been unprecedented. The increasing popularity of electricity is evidenced by the fact that during the period referred to no less than the equivalent of 22,707 8 c.p. additional lamps have been connected to the Corporation mains; 35,314 yards of additional mains have been laid, including power mains in Portland-square and King-square, and extensions of the lighting mains in all directions. As proof of the increased demand for electricity, it is mentioned that during the month of December 291,064 units were sold, as against 245,320 during the same month of the previous year. The works at Temple Back not being of sufficient capacity to cope with the demand in the near future, the Corporation have purchased 9½ acres of land by the Feeder-road, at Avonbank, on which it is proposed to erect a large station, the ultimate capacity of which will be 96,000 h.p. At present the contractors are busy constructing the foundations for the first instalment of the scheme, which it is hoped will be ready for running by the coming winter. The contract for the buildings has been let, and tenders for practically all the plant have been accepted. The first instalment of the station will be equipped with Babcock & Wilcox water tube boilers of the largest size, working at 200 lb. per square inch (as compared with 125 lb. per square inch at the Temple Back Works), two alternators of 0.75 K.W. (1,500 h.p.) capacity each, driven by Willans's high-speed engines.

THE ANCIENT CROSSES AND HOLY WELLS OF LANCASHIRE.—At a meeting of the Lancashire and Cheshire Antiquarian Society, held at Cheetham College, Manchester, recently, Mr. Henry Taylor read the fourth paper of a series of seven on the ancient crosses and holy wells of Lancashire. He dealt with the Hundred of West Derby, which measures, roughly, twenty-six miles from east to west, its southern boundary being the Mersey. A map exhibited by Mr. Taylor showed the sites and remains of no fewer than one hundred ancient crosses. This large number, he said, was due no doubt to the fact that in this part of Lancashire the Reformers never succeeded in exterminating the old Roman Catholic faith. Many of these crosses were put up in the thirteenth century, or even earlier, to mark the boundaries of church and other lands, and others were erected as market crosses. The demolition of most of these market crosses was in part due to sheer vandalism, and to the fact that it had been found more convenient in modern times to conduct business in town halls or other buildings. Other crosses were placed near holy wells, of which there are several in the Hundred, justly noted, and still occasionally used for medicinal and healing qualities. A medieval well adjoining Lathom Park, dedicated to St. Mary Magdalene, was converted by the impoverished sixth of the seventh Earl of Derby, at the end of the Cromwellian epoch, into a fashionable spa. The spring dried up when mines were sunk at Skelmersdale. Near Ormskirk there was a remarkable group of crosses. Within a circle four miles in diameter there used to be no fewer than eighteen crosses. Several of these were in existence at the time of the complete example remained to-day. The group of crosses appeared to lead in three lines from Scarisbrick Priory to the churches at Halsall, Ormskirk, and Burscough Priory, and until quite recently they were used for devotional purposes in Roman Catholic funeral processions, the mourners stopping at the site of every cross to offer prayers for the dead. Another noticeable group of crosses was found near the ancient parks of Ince Blundell, Little Crosby, and Sefton. The landowners in this part of the Hundred had been Roman Catholics for many generations, and the crosses had been well attended to. An ancient cross standing in the Little Crosby Park was said to have been moved there for safety from the village green at Great Crosby. At its foot the proclamations of the manorial court were made, and the ancient custom of flowering the village cross was kept up on St. John Baptist's Day so late as the year 1708. In the twelve miles of country between Liverpool and Warrington the remains or sites of upwards of twenty ancient crosses were recorded on the Ordnance maps. Very few of these remained, but some had been restored or rebuilt.

PROPERTY SALES.—In June next, by direction of Earl Wharnclyffe, will be offered for sale the freehold estate known as Wharnclyffe House, No. 15, Curzon-street. The house, which stands within its own grounds covering about 29,000 feet superficial, is set back from the line of the street and is situated on the site of Beilby's "Old Chapel" (the earlier one)—notorious for the Mayfair marriages. The house has an elevation in three floors, with a tetrastyle Ionic order and pediment upon a rusticated base in the centre, the two wings having rounded bays. The frontage extends over 133 ft. The house has belonged during a long period to the Stuart Wortley family, and was the home of James, first Lord Wharnclyffe. (2) The Thorney House estate, which extends over 40,000 feet superficial, at a frontage of about 174 ft. to the high road and a return frontage of 275 ft. along Palace Gate. The house was built after the Tudor style by Messrs. W. Cubitt & Co.

in 1869-70 for William, eighth Duke of Bedford who had purchased the land from that firm. Our readers will remember that the Duke's covenant to erect not more than one dwelling-house, which was to be used for a private residence only, gave rise to a suit in Chancery, brought against Mr. Hoesgood, the owner of the estate, by Mr. G. M. Rogers and the owners of the house in Palace-gate which P. C. Hardwick designed (1873-4) for the late Sir John Millais. (3) The Royal Orthopedic Hospital (about 7,240 ft. superficial in Oxford-street, the site of which was valued at 36,000, two years ago by a well-known surveyor. The hospital, established in Bloomsbury-square in 1838 by Dr. Little, migrated to its present quarters about sixty years ago; in 1899 the premises were enlarged and altered, at a cost of nearly 2,000, after Mr. Keith D. Young's plans and designs, the sanitary works being executed under Professor Corfield's directions. We understand that an offer of 37,700, has been made for the property, which is freehold. (5) Building land at Isleworth, which forms a portion of the Kendal House Estate, the residence of the Duchess of Kendal, *temp.* George I. After her death the grounds were opened as a place of public resort, a dancing-room was built, and an orchestra was erected by the water side; (4) Lauriston House, Wimbledon Common, the home, in his boyhood, of William Wilberforce; (6) Sipton Court, near Chipping Norton, about 1,600 acres, with a fine old Elizabethan house, during many generations past the home of the Reade family, has been sold for nearly 61,000, and the Kursaal at Margate has been purchased for 16,000, the sale having been made in the matter of Samuel Allsopp & Sons Limited, Margate and Southend Kursals, Limited, and others. The defendants in that case acquired the property in 1898, at a cost of 45,000, and have expended about 2,500, in building operations on the Undercliff, adjoining Fort-parade, for the new frontage, with a sea-wall, 500 ft. long. Mr. George Sherin and Mr. John Clarke were appointed as architects jointly, to the company. The plans and designs for the Kursaal at Margate, estimated to cost 90,000,—were prepared by Mr. John Clarke.

AUSTRALIAN MALACHITE.—Hitherto the principal supply of this beautiful marble, which is largely used in Europe for mantelpieces, pedestals, and similar decorative purposes, has been obtained from Russia, but it is equally abundant and fine in quality in New South Wales, where its colour ranges from pale emerald to deep green, the various layers often possessing different shades of colour, and forming a most beautiful and valuable stone for ornamental and inlaying purposes. Crystals are occasionally met with, and sometimes of large size; those from the Cobar mines are particularly beautiful. It is found in most of the upper workings of New South Wales copper mines, as in the Bathurst district, with chlorite, vitreous, yellow, and other copper ores; at Cambalong earthy and fibrous malachite is associated with barites or heavy spar, and with yellow and peacock ore; at Cobar, County Robinson, with steatite; at Mitchell's Creek, Wellington county Wellington, mixed with other surface ores, and often containing large quantities of gold and silver.

CAPITAL AND LABOUR.

CARPENTERS' STRIKE, WESTON-SUPER-MARE.—The master builders having refused to comply with the demands made some months ago by the carpenters and joiners for an increase of wages by 4d. per hour, the men have gone out on strike.

STRIKE IN THE LEICESTER STONE MASONRY TRADE.—The dispute in the stone masonry trade in Leicester reached a climax on the 1st inst., when the men, in accordance with notice given to the masters, refused to continue to work under the conditions which have hitherto prevailed. As a result about 170 men are idle, and their present determination is not to resume work until their demands are conceded. These, briefly, are for an advance of 1d. per hour, making the total 10d. for masons who work in the sheds, and 10½d. for men who work on buildings. They also demand an alteration of the rules governing their employment. The masters refused both demands, hence the strike.

CARPENTERS' STRIKE IN LIMERICK.—The carpenters of Limerick struck work on the 1st inst. in all the shops where their demand for an increase of wages from 32s. to 34s. per week was not entertained. All the local firms save one refused the claim, which, in addition to increased wages, involves questions regarding the imposition of finished woodwork and a limitation of the number of apprentices to be employed.

THE STRIKE IN THE BRADFORD BUILDING TRADE.—A meeting of the master builders of Bradford was held on the 6th inst., and it was reported that masters who were not associated with the society, and who had been paying the old rate of wages, had now ceased to do so, and were demanding a reduction. It was also reported that in one instance the joiners and masons had resumed work at the new rate. In reply to a statement issued by the master arguing that contractors, when taking contracts under

the Corporation, should adhere to the standard rate of wages when these jobs were taken, the masters say that some of the principal contracts now going on under the Corporation were taken prior to the last advance given to masons and joiners. For instance, the heaviest contract in the city—the Cartwright Memorial Hall—was let in March, and the masons' advance took place in May, and consequently the contractor has presumably been paying 3s. a week more to his men than he calculated upon. The same conditions apply to the joiners. In the same way as the Cartwright Hall the contracts for the new fire station were let in March, prior to the last advance to masons and joiners. The master masons say that they would have no objection to paying 1s. per hour if the trade would justify it. They declare, however, that the men know the trade has fallen off greatly since the last advance.

LEGAL.

POINT UNDER SECTION 145 OF THE LONDON BUILDING ACT, 1894.

In a Divisional Court of King's Bench composed of Justices Grantham, Kennedy, and Darling, on Friday, the 3rd inst., judgment was delivered in the case of Crow v. the Board of Works for the District of Whitechapel on the appeal of the defendants from a decision of Mr. Dickinson, the magistrate sitting at the Thames Police-court, in June last. The case was argued before Justices Kennedy and Darling last December, but their lordships then disagreed and the case was accordingly reheard on April 27 before an additional Judge—Mr. Justice Grantham—and judgment was then reserved. The case was reported in the *Builder* of May 4.

A summons was taken out by Mr. Crow, the District Surveyor, against the defendants, the Local Authority within the meaning of the Electric Lighting Acts, 1882 and 1888, for the district, alleging that the defendants had not given him notice under Section 145 of the London Building Act, 1894, before commencing the construction of a number of boxes or inspection chambers under the streets in the district for the purpose of electric lighting. The magistrate found as a fact that the boxes so constructed "were buildings, structures, or works" within the meaning of Section 145 of the London Building Act, 1894, and having regard to Sections 72, 201, and 203 of the said Act, he held that the provisions of Section 145 were not inconsistent with the provisions in the Special Act, and imposed on the defendants the nominal penalty of 1s., and ordered them to pay 10l. 10s. costs. From this decision the defendants appealed.

Mr. Justice Grantham, in the course of his judgment, said he thought that the magistrate had come to a proper decision on the matter. The question was whether the London Building Act of 1894 revoked or altered by the construction of general words the Electric Lighting Acts of 1882 and 1888? Was the language of the former Act, where it directed that notice should be given to the District Surveyor before commencing work, inconsistent with the powers given to the appellants by the Electric Powers Act, 1882 and 1888, and the Provisional Order of 1892, for the supply of electricity to their district? In his Lordship's judgment it was not. It was true that the appellants had power given them to provide electricity for their district, and that they were obliged to lay the scheme they proposed to adopt and the plans by which they proposed to give effect to it before the Postmaster-General and the County Council, but neither one body nor the other was bound to see how the work was done. The necessity for the sanction of the Postmaster-General was for the purpose of enabling him to see that the interests of the Post Office were not prejudiced, and not in any way to provide for supervision of the work done. In the same way the notice to the London County Council as the superior Municipal Authority of the district was desirable, if not necessary, in order that the Council might be cognisant of what was going to be done in one of the districts included in its municipal area, and such an important matter as the provision of electricity. Not one of these notices, however, had reference to any control of the way in which the work was to be done, or as to the compulsory supervision of the work during its construction, but Section 145 of the London Building Act, 1894, required such a notice to be given to the District Surveyor as would enable him to know when the work was to be commenced, and the details of the proposed work so that he could survey the work when commenced and see that the details were carried out in conformity with any by-laws that might have been passed with reference to such buildings. He did not see how it could be said that it was inconsistent with, or contradictory to, the general provisions of the Electric Lighting Acts under which the appellants obtained their authority to provide the electricity for their district. For those reasons his judgment must be for the respondent.

Mr. Justice Kennedy concurred, and Mr. Justice Darling added that although the notice under Section 145 of the Act did not see his way to agree with the judgment of the Court he was at the same time unwilling to differ.

The appeal was accordingly dismissed with costs.

* See the *Builder*, November 12, 1899, "Legal: Rogers v. Hoesgood;" and June 10, 1896 (illustrations).

A CONTRACTOR'S DILEMMA.

The cases in an arbitration between George White and Arthur came before a Divisional Court of the King's Bench composed of Justices Kennedy and Phillimore on May 2, and which raised a question of some importance to contractors as to the construction to be put upon the word "penalty" as used in a contract. The case came before the Court in the form of a special case stated by the Arbitrator from which it appeared that Mr. George White was the assignee of Mr. H. D. Barclay, who had entered into a contract with Mr. Robert Arthur for the supply of an electric light installation for the Princess of Wales's Theatre at Kennington for an agreed sum of 5,000l. A clause in the contract provided that the whole of the work, except the plant, should be completed before November 20, 1898, subject to a "penalty" of 15s. per day, and that the plant should be completed by December 10, 1898, subject to a penalty of 3s. a day for every day the work remained unfinished. The work proceeded until April 5, 1899, when the contractor received notice determining the same. The contractor claimed a considerable sum under the contract, but Mr. Arthur counterclaimed for a large amount including 1,980l. as penalties for non-completion of the work within the time provided by the contract. The matter went to arbitration, when on behalf of the contractor it was contended that the sum of 1,980l. was not recoverable from him on the ground that the claim was for penalties proper and not for liquidated damages. The arbitrator stated the case to have the opinion of the court as to whether the amounts specified in the contract were "penalties" or "liquidated damages."

Mr. E. Tindal Atkinson, K.C., and Mr. Longstaffe appeared for the plaintiff (the contractor); and Mr. Eldon Banks, K.C., and Mr. M. V. Banks for the defendant.

Without calling upon counsel for the defendant, Mr. Justice Kennedy, in giving judgment, said it seemed to him, both from the difference in the two sums mentioned in the contract, and looking at the nature of the work to be done, and the place where it was to be done, that the amounts were intended to be liquidated damages. He was strengthened in that view by the clause in the contract which gave the engineers power, if necessary, to employ other contractors to complete the work, and provided that the defaulting contractor should be liable for loss so incurred, without prejudice to his obligation to pay the penalties incurred by him under the contract. He thought, therefore, that in a contract of that kind, whilst the presumption was in favour of that meaning being attached to the words which they bore *primâ facie*, the real intention in the present case was that the amount specified should be treated as liquidated damages. Mr. Justice Phillimore agreed.

A DISTRICT SURVEYOR AND HIS FEES.

The case of Corbett v. Badger came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Mr. Justice Lawrence, on the 3rd and 4th insts., on an appeal from an order of a Metropolitan Police Magistrate, under the London Building Act, 1894, holding that the respondent was entitled to recover from the appellant fees amounting to 546l. 7s. 6d., alleged to be due to him as District Surveyor of Lewisham, under the London Building Act, 1894.

It appeared that in 1899 the appellant was the owner of the St. Germain's Estate, Hither Green, Lewisham, and he contracted with a Mr. John Lawrence, a builder, to erect certain houses on the estate. Mr. Lawrence erected the houses and was paid the contract price, which included any fees which Mr. Lawrence was liable to pay to the respondent under the Act. Section 154 of the Act provides that certain fees shall be paid by the builder or, in his default, by the owner or occupier. Section 157 limiting the time within which they shall be paid, viz., within fourteen days after the roof of any buildings surveyed by the District Surveyor under the Act has been covered in. The latter Section also provided that if the builder, owner, or occupier refused to pay the fees, they might be recovered in a summary manner on its being proved to the satisfaction of the court that a proper bill specifying the amount of the fees was delivered to him in a registered letter addressed to his last known residence. It was admitted that the claim was by the respondent for fees to which he was entitled under the Act. The only question now was whether the complaints had been made within six months after the matter of complaint arose, as was required by the provisions of the Summary Jurisdiction Act, 1848. The facts, as disclosed by the special case stated by the magistrate, showed that the roof was completed in December, 1899, and between January 17 and September 10, 1900, he delivered to the builder the bills contemplated by Sub-section 2 of Section 157 of the London Building Act, 1894. The builder became bankrupt on July 2 and on November 8, summonses were taken out by the District Surveyor against the owner. The question the Court had to determine was whether the six months ran from the expiry of the fourteen days before referred to, or whether

they ran from the time the bills were delivered to the builder when some of the summonses would be out of time, or whether they ran from October 20, 1900, the date of the notices to the owner, in which case none of the summonses would be out of time.

After hearing the arguments of counsel their lordships affirmed the decision of the magistrate, holding that none of the summonses were too late. Judgment was accordingly given for the District Surveyor, and the appeal dismissed with costs.

Mr. Macmorran, K.C., and Mr. R. C. Glen appeared for the appellant; and Mr. Ruegg, K.C., and Mr. Montague Shearman for the respondent.

POINT UNDER THE METROPOLIS MANAGEMENT AND BUILDING ACT, 1878.

In the King's Bench Division, on the 7th inst. Mr. Justice Channell delivered judgment in the case of the St. James's Hall Company v. The London County Council, an action tried before his Lordship, sitting without a jury, in order to obtain a decision upon the true interpretation of Section 11 of the Metropolis Management and Building Act, 1878, which gave to the Metropolitan Board of Works (now the London County Council, their successors), certain powers for the prevention of danger from fire in music-halls which had been licensed for the first time prior to 1878.

The Metropolitan Board had exercised those powers in 1885 in reference to the St. James's Hall owned by the plaintiff company, and the company contended that the powers of the section must be exercised once for all. The defendants had served another notice purporting to be under the powers of the section, and the plaintiffs brought the present action for a declaration that the notice was *ultra vires* and for an injunction. The plaintiffs had obtained an interlocutory injunction restraining the defendants from acting upon the notice until the trial, and the question for his lordship was to determine whether the plaintiffs' view of the section was right.

The facts as appeared from the judgment were as follows:—In 1885 the Metropolitan Board, proposing to proceed under the section, prepared a draft notice of their requirements, which was the subject of negotiation between Mr. Walter Emdin, the plaintiffs' architect, and the defendants' architect. The result was that modifications of the first proposals of the Board were agreed to which were embodied in the formal notice served and dated August 10, 1885. The works in that notice were done by the plaintiffs at a cost of more than 7,000l. The original proposal of the Board included the pulling down of an existing staircase, and the re-erection of a better staircase at the same place. The modifications agreed on included the pulling down of the staircase, but it was agreed that it should not be re-erected, the necessary accommodation being provided elsewhere. One of the things which the defendants now directed was the erection of a staircase at the same spot. Since the works were completed in 1885, the plaintiffs had from time to time at the suggestion of the defendants voluntarily made some alterations in such matters as the seats in the hall and otherwise, but they had done so without admitting the right of the defendants to require them to do those or other alterations. The defendants claiming power under Section 11 of the Act required the plaintiffs to execute further works, the cost of which was estimated at upwards of 4,000l., and had obtained the leave of the Secretary of State to make the requirements, but without prejudice to the question now raised. The question his lordship had to decide was whether the defendants had power under the section to require the plaintiff company to comply with their requirements. His Lordship said it must be assumed that when the works done in pursuance of the former order were completed the defects were remedied, or, at all events that, in the opinion of the Board, they were remedied, and that they could not in the next year have said that they had made a mistake and ought to have ordered something more or something different; and if they could not, neither could the London County Council, who succeeded to their rights. Undoubtedly the Board did exercise in 1885 the powers of Section 11, and if there were any defects now, they either existed prior to the order of 1885, and ought to have been dealt with, or they were occasioned by the works done in pursuance of that order. In either case the powers under Section 11 in his opinion were exhausted and therefore the defendants could not now exercise the powers. In these circumstances he must give judgment for the plaintiffs with costs. Judgment accordingly.

ACTION AGAINST A DISTRICT COUNCIL FOR NOISANCE.

The case of Hawkes v. the Leyton Urban District Council came before the Court of Appeal composed of Lords Justices Collins and Stirling on the 6th, 7th, and 8th insts., on the appeal of the defendant Council against an order of Mr. Justice Buckley in the Chancery Division, ordering that a writ of sequestration should be issued against the defendants for disobeying an injunction granted in April last year restraining the defendants, at the suit of the

plaintiff, a resident at Leyton, from carrying on their works in connexion with electric lighting in such a way as to cause a nuisance by noise and vibration. On two occasions the operation of the injunction was suspended on undertakings given by the Council, on whose behalf it was stated that they were erecting steam plant, which would be no nuisance. Upon appeal this Court confirmed the order of the Court below, but limited the injunction to noise and vibration by the use of gas-engines. The steam plant had since been brought into operation, and it was represented that the gas engines were now only worked for certain hours a day as auxiliary to the steam plant. The plaintiff, contending that the Council had broken their undertaking and disobeyed the injunction, applied for a writ of sequestration, which Mr. Justice Buckley granted, on the ground that the defendants had deliberately and wilfully disobeyed the order of the Court.

Mr. Henry Terrell, K.C., and Mr. Dibdin, K.C., appeared in support of the appeal; and Mr. Astbury, K.C., and Mr. A. Beckett Terrell for the plaintiff.

At the conclusion of the arguments their lordships held that there had been a breach of the injunction, and that the writ must go. It could, however, lie in the office for a week to enable the defendants to apply to Mr. Justice Buckley for any indulgence they might think themselves entitled to.

FORD v. BEMROSE & SON.—In the report of Ford v. Bemrose & Son in the BUILDER last week the sentence in the judgment "It is true I agreed to erect seventy-two buildings" should read "It is true I agreed to erect your building."

RECENT PATENTS.

ABSTRACTS OF PATENTED INVENTIONS.

318.—KILNS: C. Czerny and C. Schlump.—Gas-fired continuous kilns are built up of two rows of arched chambers, set cross-wise, with an intermediate passage and flues below them; the gas flows through passages underneath the kiln-chamber floor, and thence through passages in the corners of the chamber at a point just under the spring of the arch, whilst the air flows from the chamber which is being discharged through gratings in the floor, and so through all the chambers that are being cooled into the chamber wherein the goods are being burned, that it may mix with the gas therein. The products of combustion are conveyed through the chambers in which the preliminary heating is in progress, and thence follow the course of the air, finally escaping from the most recently charged chamber into the chimney flue. The flues and dampers are duplicated, so that one set may be repaired whilst the other set is being used.

403.—SAWING OF STONE, MARBLE, &c.: S. Holgate.—Sliding sleeves, united with girders and cross girders that constitute a frame, are mounted upon three pillars at each side of the machine, and have bearings for the pendulum rods from which the saw-frame is suspended, the upper ends of the rods being T-shaped in order that they may raise weights or touch springs when the stroke is nearly ended. The driving gear, which rises and falls with the saws, is mounted upon the girders, and consists of a crank shaft with a fly-wheel and connecting rods; chains which pass around the drums of shafts driven with worm-gearing, cone pulleys, and fast and loose feed-regulating pulleys feed the sleeves up and down the pillars. Provision is made for driving the crank shaft in any position of the girder-frame by means of a belt around the main and other pulleys.

422.—AN APPLIANCE FOR DRAWING PURPOSES: J. A. Jones.—The instrument is devised for use in measuring angles in perspective in drawing from models, and determining the proportional dimensions of the parts of the models. Two graduated arms are pivoted on to a cross-piece of a rectangular frame, on the sides of which is marked a scale of degrees to be traversed by the ends of the arms; two additional arms are adjustably pivoted on to a sleeve that slides upon the cross-piece. When the frame is held at arm's length the required angles and dimensions may be observed, the latter pair of arms serving for use in respect of drawing parallel lines of the models; the four arms may be otherwise mounted between two parallel and graduated frames.

426.—HOISTS FOR BUILDERS' USE: F. Fishburn.—The apparatus is intended especially for lifting building materials in wheel-barrows. The lifting-rope is wound around two pulleys at a height above the level up to which the load is to be raised, and engages with a winding groove cut in the winch barrel. When its one end is at its highest level, the other end is at the level of the ground. In the case of heavy loads, the rope should be turned round the barrel more than once, the coils being kept in their places with small pulleys upon spindles that will move and follow the winding groove in the winch, and adjustable guide-pulleys set lengthwise upon a bar will serve to increase the extent of contact of the rope with the barrel.

431.—WORKMEN'S CLAMPS: F. Beck.—Upon the top bar is a dove-tailed projection on which the board that supports the work will slide; a screw,

which is to be screwed into the bottom bar, is screwed to the top bar and will adjust the distance between the two bars accordingly with the thickness of the bench or other support, which is gripped firmly by turning the other screw, that is passed through the bottom bar and is pressed against the top bar.

435.—SAFETY APPARATUS FOR USE WITH LIFTS: F. T. Hollins and H. C. T. Amundt.—When each well-door is closed, its fastening and an electro-magnet above the door are in the circuit of a battery, and the circuit can be completed only with the pressing down of a treadle in order to lock the hand-ropes whereupon one can draw the bolt of the door; an electro-magnet (to be energised only when every door is shut) pulls out of engagement a catch which locks the pressed-down treadle. For opening the closed door, a pivoted arm can be reached from only the outer side of the door works the bolt which holds up a catch consisting of the armature of an electro-magnet, contact becomes broken with the motion of the arm towards the left, and another contact is made by means of which (the treadle having been pressed down) circuit through the magnet becomes complete and the armature is sustained so that the bolt may be drawn. The invention provides, generally, that the doors shall be unlocked as the cage is stopped, when one door is opened the others (as well as the locking-lever of the hand-ropes) shall be locked, and all the well-doors shall be locked whilst the cage rises or falls within the well.

444.—A SOLDERING-IRON: C. Shields.—Benzine or other spirit fuel is stored within the hollow handle of the soldering-iron, from which a tube extends into a chamber which is covered with a pierced diaphragm. Upon the extended part is a slotted case for the admission of air, and two soldering-irons are mounted upon the head of the case. The supply of vapour to the chamber is regulated with a screwed valve spindle; when vapour has been generated by the heating of the extension, it passes into the casing, where it will become ignited and play upon the irons within a shielded space between the head and one of the irons.

464.—HEATING BUILDINGS WITH HOT AIR: W. C. Macey.—At one corner of a rectangular casing is a fire-box from which gases and smoke are conveyed through pipes set with a slight fall and crossing air-chambers around the inner side of the casing. As the air which enters into the lower portions of the chambers becomes warmed, it finds its escape through slots in the tops of the chambers to the upper parts, whence it is conveyed for heating the building.

487.—AN APPLIANCE FOR USE WITH BAND-SAWS: F. W. King.—In order that the pulleys may better resist the pressure from the wood, and that the saw may be retained upon them, the pulleys are fashioned with recesses at the centres of the rims, into which are inserted bands of some elastic material mixed with bands of webbing or wire-cloth. The curved top of the rubber band projects above the surface of the pulley when it is not forced down by the saw-hand. The specification includes other methods of affixing the band.

507.—ELECTRICAL BELLS: A. Clarke.—The frame constitutes the core of the magnet. It has pole-pieces and flanges, between which the copper wire is wound. The binding screws, the contact screw, the armature, and the cover are carried upon elliptical flanges, and the bell upon the lower extremity.

533.—A COMBINED SET-SQUARE AND BEVEL: A. C. Smith.—Two blades pivoted at one end of a slotted stock with, it may be, a pivoted and slotted blade at the other end, can be clamped in any position required with a set-screw; the blades when not being used can be folded into the slots. Circular slots are cut in the two blades so as to intersect at the middle point between their pivots, and the shank of the clamping screw is passed through the pivots. A stud that works in a cam-slot in one of the blades is attached with an anti-friction roller to the other blade, the cam allowing the motion of one blade to follow that of the other.

552.—KILNS AND FURNACES FOR BURNING LIME, CEMENT, &c.: E. Gobbe.—For cooling the material the inventor contrives that air shall enter the base of the furnace in a volume larger than what is needed to support combustion, and that the surplus air shall be carried away through openings and flues in the walls so as to keep them cool. The "baking-zone," less high than is customary, is built up with ribs, the furnace above it has cross walls that form cells, in which the material undergoes the first stage of the heating process; vertical flues (through which stoking tools and fuel may be introduced) are set across the cell-walls and carry combustion products from the "baking-zone" to the chimneys.

564.—TUMBLER LOCKS: F. Gelle.—The lock, adapted for windows, doors, and so on, has its tumbler and spring mounted upon the bolt. When the bolt is being locked, the end of the tumbler is first lifted clear from a fixed stump by the turning of the key, which will then force the bolt forwards as it presses against the lower portion of the tumbler. In the event of the employment of a key which is just long enough for lifting the tumbler without bringing the bolt, the bolt will be left in a middle position, from which only the proper key can draw it back.

568.—A DRINKING-APPLIANCE FOR HORSES AND CATTLE: A. Conlhorst.—The inventor's object is to lessen the risk of contamination by diseased animals. He provides a separated trough for each animal, and fits the common supply of water with valves and weirs which will prevent it from returning to the supply channel as well as from flowing out of one trough into another, each trough has a non-return valve connected with the common channel, and an overflow pipe conveys surplus water from the troughs.

603.—THE BUILDING OF FLOORS AND CEILINGS: A. Harmin.—For sustaining the concrete until it has become set are devised flat angular telescopic bars, of which the adjustable lugs will fit over the lower flanges of the girders, and boards are laid upon the bars, each of which will slide through a guide or sleeve at the end of its companion bar; the lugs are fastened to the bars with pins that pass through them and through holes in clamping-bands.

639.—ELECTRICITY METERS: F. R. Dick and Reason Manufacturing Company.—So that a single ordinary meter may be available for measuring the sum of the currents or energy employed upon both sides of a three-wire system, the inventors divide the two sides beyond the meter in the shape of independent two-wire circuits, and connect the two inner wires through low equal resistances to the neutral main, thus the meter—which may be after the maximum demand indicator type—will carry a current in ratio to the sum of the supplied currents, being connected between the separate ends of the two low equal resistances.

641.—SLOP SINKS FOR HOSPITALS, AND A CONTRIVANCE FOR GENERAL FLUSHING APPARATUS: F. Shanks.—Ridges, which are formed within the slop sink, act as a support for the bed-pan when it has been inverted upon the sloped bottom of the sink. A vessel, fitted with a tubular outlet valve and an overflow, has a perforated coil at its base, through which steam is admitted for cleansing and sterilising purposes. For obviating the necessity of the discharge of flushing-siphons, a screw, which will regulate the size of the air-inlet, is fitted upon the air-pipe, as specified in No. 27,004 of 1897, and a hanging-tube, either pierced at its end or fitted with a dome, is attached to the ball-and-boat valve. The tube may be provided with an air-vent, or be turned into a V-shape, and may be lined with one of rubber constricted near its middle point.

729.—ELECTRICAL SWITCHES AND CUT-OUTS: C. M. Dorman, R. A. Smith, and H. G. Baggs.—For increasing pressure upon the contacts when the switch is "on," and lessening it before it is moved "off," the main contacts are connected by a contact, mounted on an arm or handle, which bears lightly against the main contacts, to the arm or handle is pivoted a lever that will press against the contacts and be itself pressed by a cam upon a pivotted bracket and worked with a weighted handle, an electro-magnet which holds up the armature retains the parts in a closed position, and upon a failure of current in the magnet the weighted handle drops so as to move the cam and free the lever from its catch whereupon a spring breaks the main circuit; the invention comprises modifications of the arrangements described, for example, a toggle-lever, having either direct or indirect action, may be substituted for the cam, and the cam may be worked by the hand.

734.—PANTOGRAPHES AND SIMILAR INSTRUMENTS: O. Richter.—Upon the last bar of a "lazy-tong" adjustment are mounted a tracer and a fixed graduated wheel. The wheel is contrived to drive a recording-wheel with a worm and a worm-wheel, and for setting the instrument at "zero" the latter gearing can be easily put out of action by means of a lever. One end of a bar which is parallel to the last bar of the "lazy-tongs" carries a pencil for the tracing of a reduced diagram or figure. The first bar of that same parallel group carries the fixing-pivot of the "lazy-tongs" at one of its ends.

MEETINGS.

FRIDAY, MAY 10.
Architectural Association.—(1) Special general meeting for the purpose of approving new by-law. 7 p.m. (2) Mr. Alfred Hands, F.R.M.S., on "The Protection of Buildings from Lightning" (illustrated by lantern views). (3) Election of officers. 7.30 p.m.
Society of Arts (Howard Lectures).—Mr. Alfred C. Eborall on "Polyphase Electric Working." III. 8 p.m.
SATURDAY, MAY 11.
Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilisation in Egypt." I. 3 p.m.
St. Paul's Ecclesiastical Society. Visit to St. Stephen's Chapel and the House of Parliament. 3 p.m.
Northern Architectural Association.—Visit to Collingwood-street and Quayside Buildings, Newcastle. 3 p.m.
MONDAY, MAY 13.
Society of Arts (Cantor Lectures).—Sir W. Chandler Roberts-Austen and Mr. Charles Rose, D.Sc., on "Alloys." IV. (This lecture will be delivered by Dr. Rose.) 8 p.m.
Bristol Society of Architects.—Mr. John Fisher on "The Work of Alfred Stevens," with limelight illustrations. 8 p.m.
Clerks of Works Association (Carpenters' Hall).—Monthly meeting. Address by the President, Mr. Spencer Green. 7.30 p.m.

TUESDAY, MAY 14.
Royal Victoria Hall, Waterloo-road, S.E.—Dr. Morgan on "Glass." 8 p.m.

WEDNESDAY, MAY 15.
Society of Arts.—Mr. Guglielmo Marconi on "Syntonic Wireless Telegraphy." 8 p.m.
Bundlers, Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
British Archeological Association.—(1) The Phené, F.S.A., on "Intercourse between the Civilised People of Britain and the great Centres of Learning and Commerce in Eastern and Western Europe, A.D. 1800, and Asia Minor prior to the Roman Age." (2) Mr. A. O. Collard on "The Oyster Dredgers and Flatsmen of Whitstable." 8 p.m.

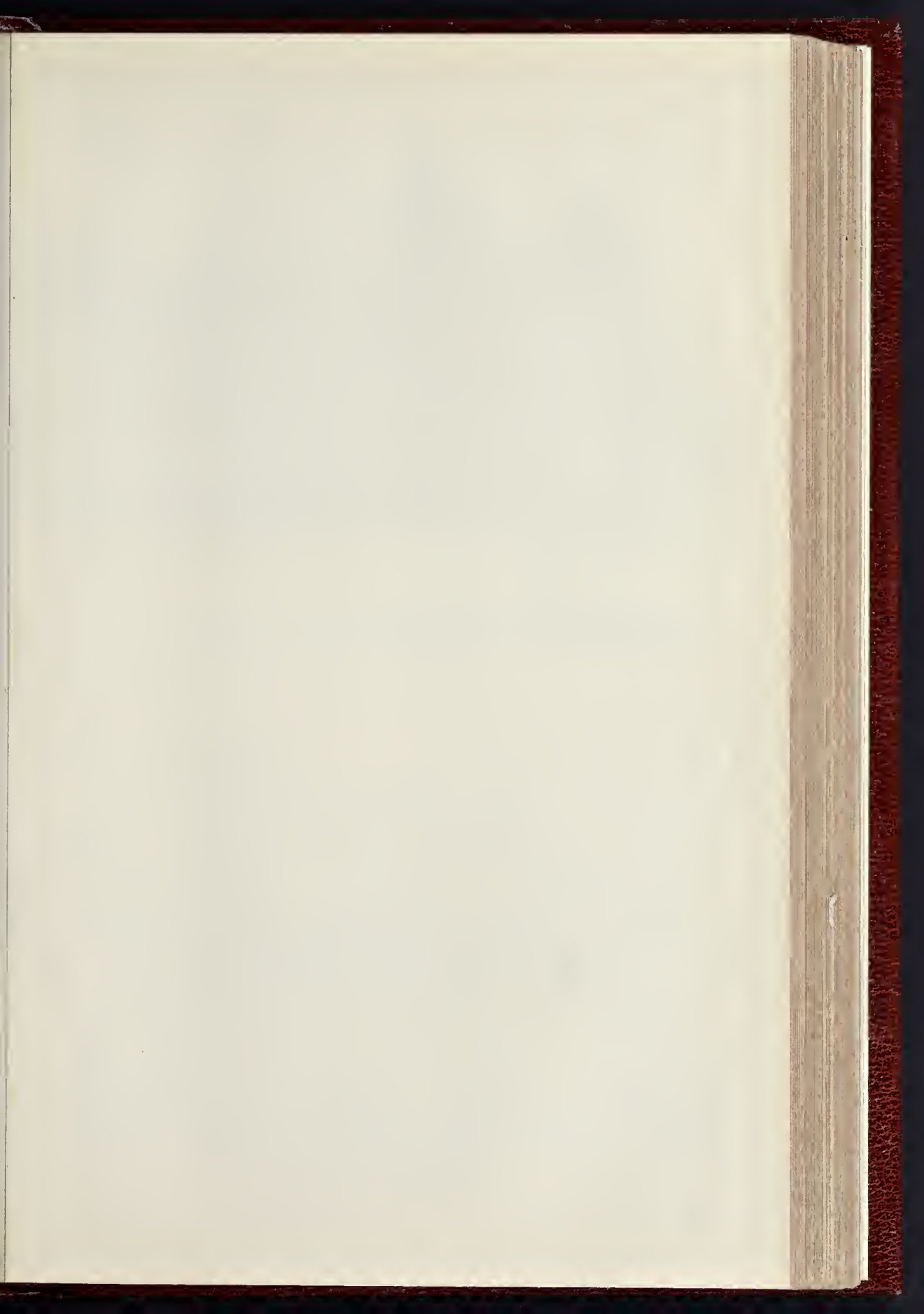
THURSDAY, MAY 16.
Society of Arts (Indian Section).—Mr. L. R. Windham Forrest on "The Town and Island of Bombay—Past and Present." 5 p.m.
Society for the Encouragement of the Fine Arts.—Miss Ethel Halsey on "Some Unfamiliar Masterpieces of the Italian School." Limelight illustrations. 8 p.m.

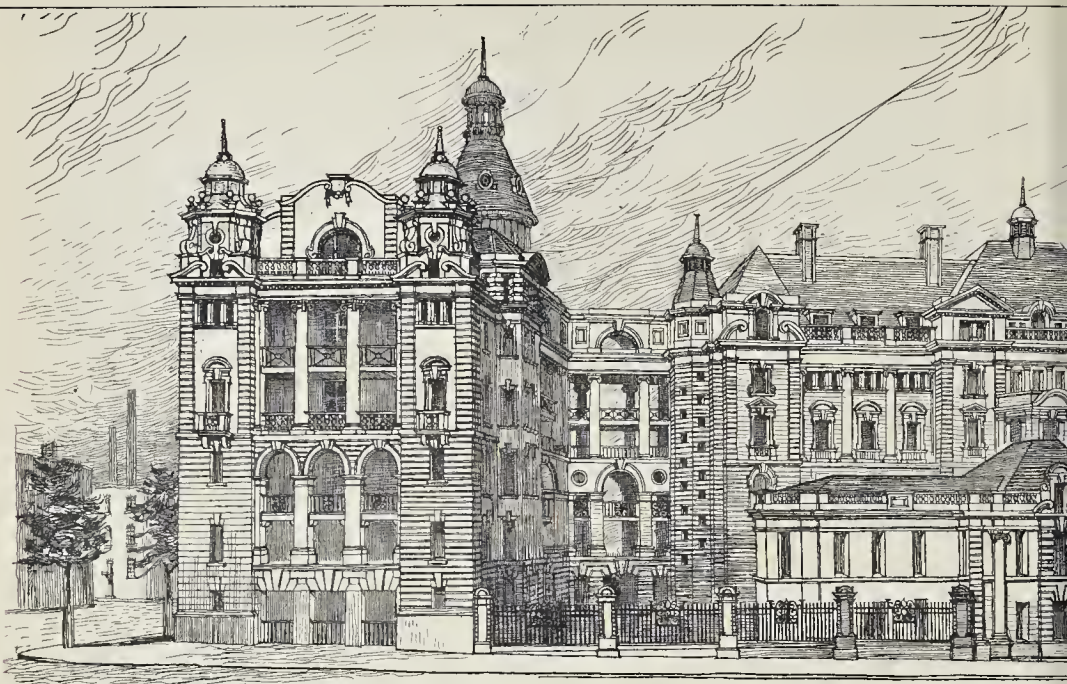
FRIDAY, MAY 17.
Society of Arts (Howard Lectures).—Mr. Alfred C. Eborall on "Polyphase Electric Working." IV. 8 p.m.
British Architectural Association Discussion Section.—Mr. P. E. Newton on "A Tour in Mid-France." 7 p.m.

SATURDAY, MAY 18.
Architectural Association.—Last Spring Visit, to Chertford House, Mayfair (Lord Burton's). 2.30 p.m.
Association of Municipal and County Engineers.—Oswestry meeting.
Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilisation in Egypt." II. 3 p.m.
Birmingham Architectural Association.—Visit to Pitt-Rivers House and Pitt-Rivers House and Glen.

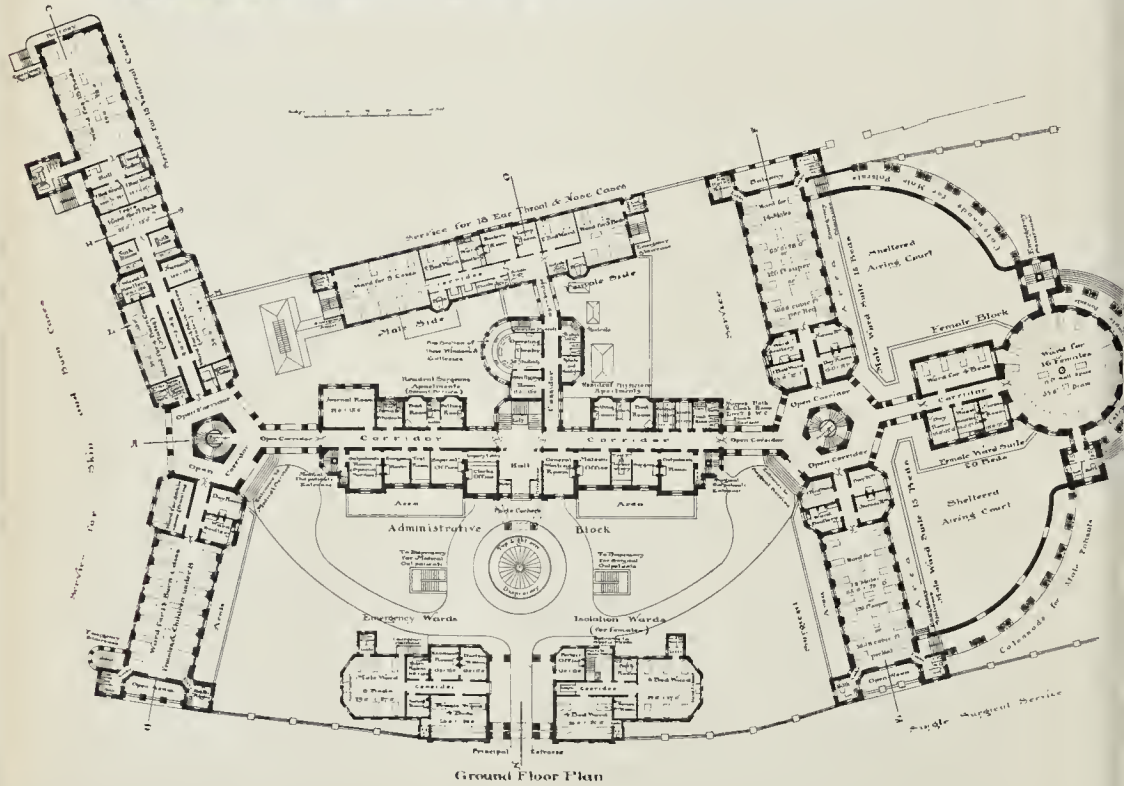
SOME RECENT SALES OF PROPERTY:

Table with columns for location, details, and price. Includes entries like 'Swansea, Glamorgan', 'Llanidloes, Montgomery', 'Southend-on-Sea, Essex', etc.





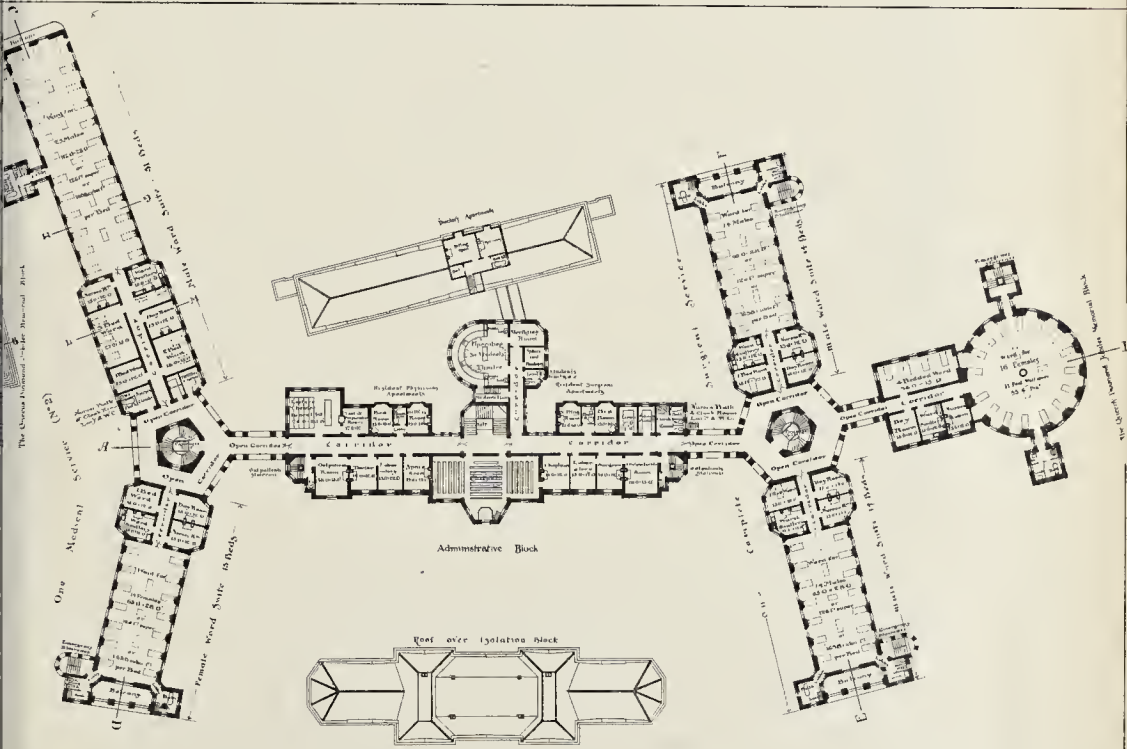
View from



Ground Floor Plan

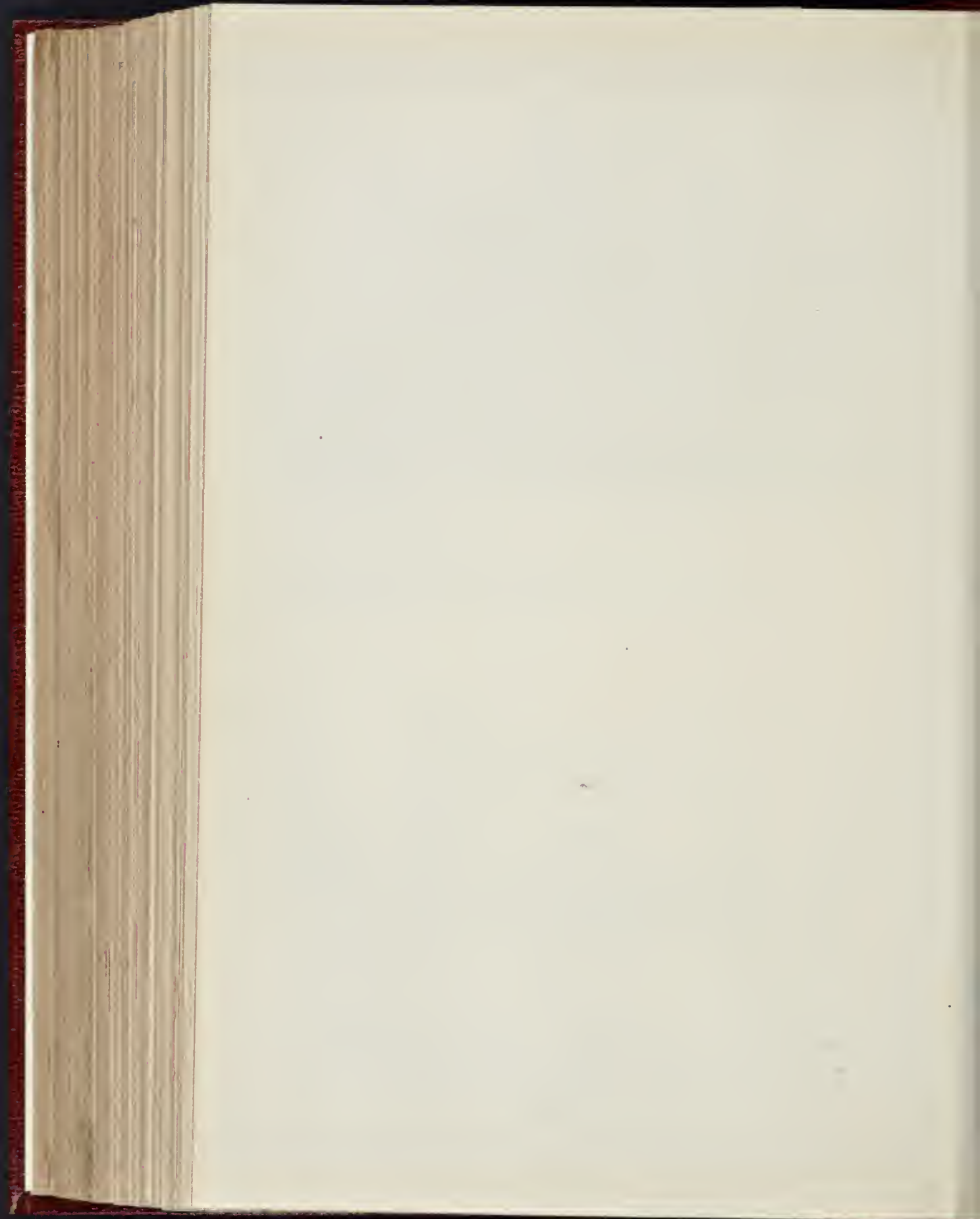


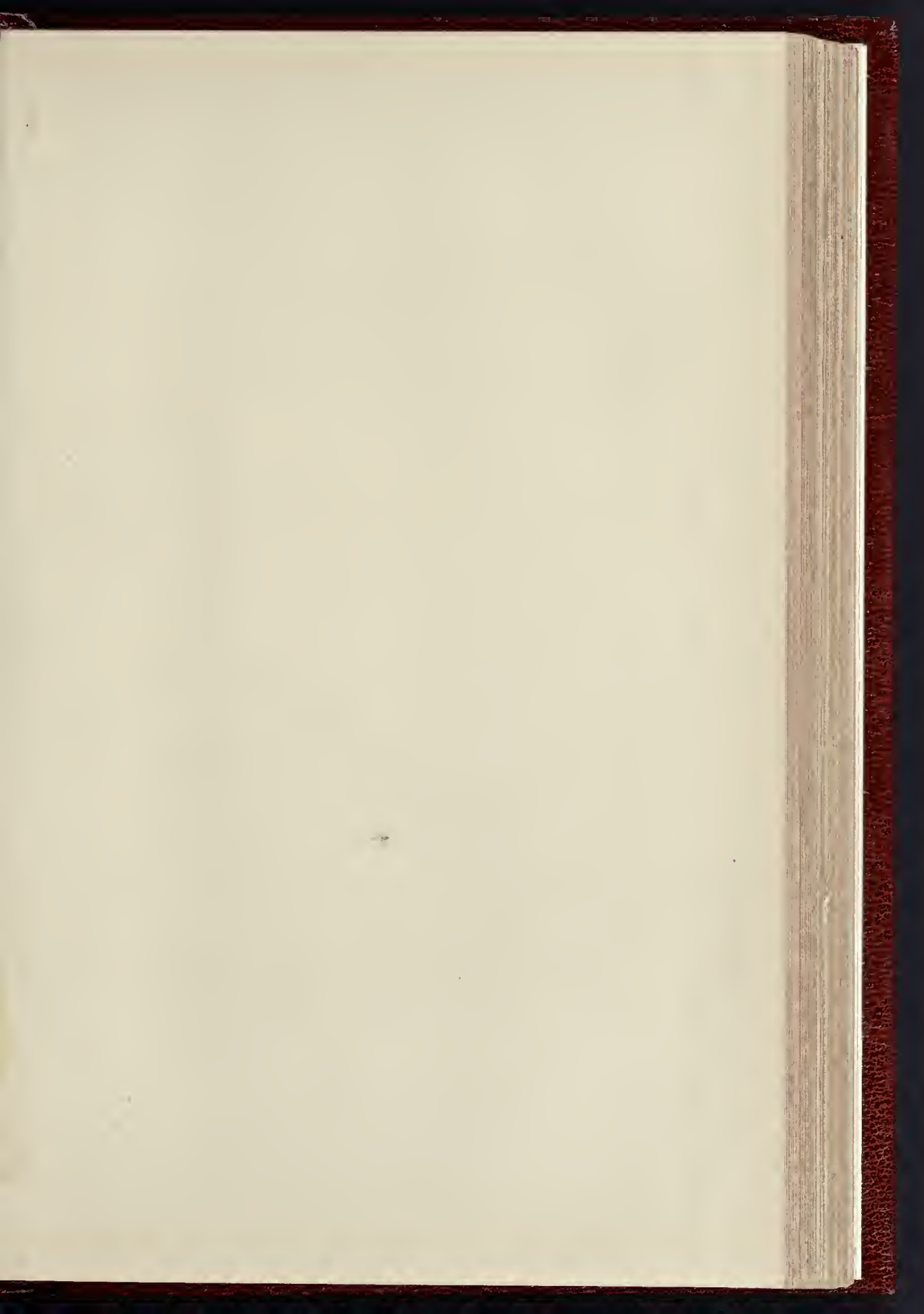
Castle Street



Second Floor Plan

PHOTO-LITHO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



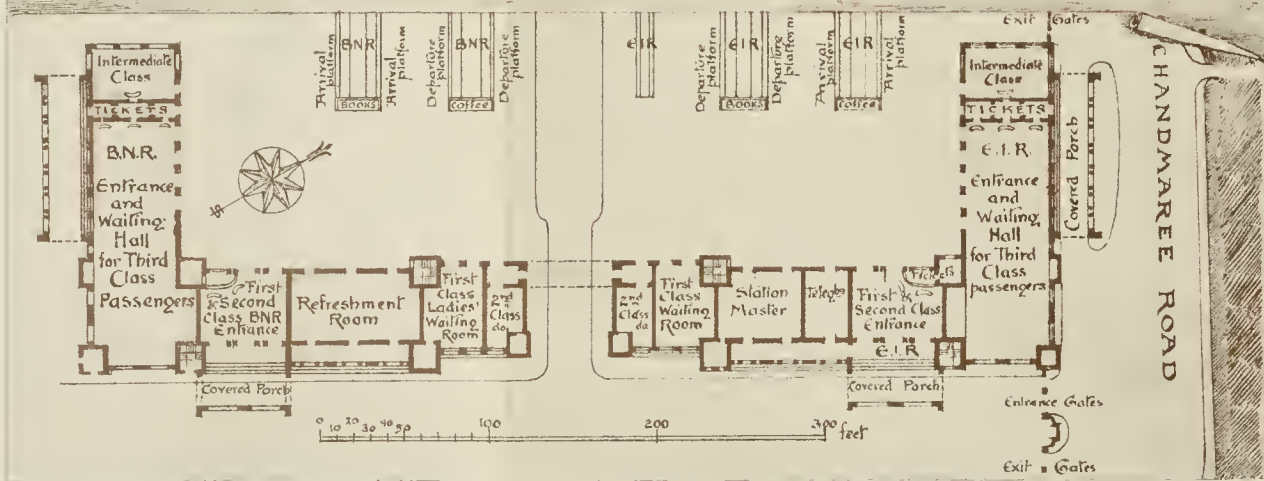


NORTH LONDON CREMATORIUM
FINCHLEY ROAD
ERNEST GEORGE & YEATES ARCHT





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



SOUTH
FOR T



BEST VIEW OF THE JOINT TERMINAL STATION
OF THE EAST INDIAN AND BENGAL & NAGPUR RAILWAYS
AT HOWRAH - CALCUTTA

HALSEY RICHARDS ARCHITECT



Table listing property addresses and prices, including entries for Bayswater, Regent's Park, Paddington, and various other districts.

Table listing property addresses and prices, including entries for Old Charlton, Barnes, Mile End, and various other districts.

Table containing 'PRICES CURRENT (Continued)', 'BRICKS, &c.', 'WOOD', and 'BUILDING WOOD—YELLOW' sections.

PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing prices for various materials such as Bricks, Hard Stocks, Rough Stocks, and other construction materials.

[See also page 477.]

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Post Office	Middleton Corporation .....	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to Schools, Park-road, Bingley	Denbighshire County Council	Armistead & Smithson, Architects, Bingley, Yorks	May 13
Rebuilding Rossett Mills Bridge	Ugmore Gas and Water Company	R. L. Williams, County Surveyor, Denbigh	May 14
Laying Cast-iron Water Mains, Nantymoel	Cardiff Corporation	G. Adams, Ash Grove, Nantymoel	do.
Offices, Roath	Mr. A. M. Read	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
House, Bucknell, Devon	Cleckheaton U.D.C.	E. H. Harbottle, Architect, County Chambers, Exeter	do.
Electric Light Station	Workington Corporation	Mr. Lund, Surveyor, Town Hall, Cleckheaton	do.
Water Supply Works	Berford Corporation	J. Eden, Civil Engineer, 58, Pow-street, Workington	do.
Road Works, Byde-street, &c.	Hove Corporation	J. H. Jevons, Civil Engineer, Town Hall, Hertford	do.
*Road-making Works	do.	Borough Surveyor, Town Hall, Hove	May 16
*Street Masonry and Jobbing Works	Chepping Wycombe Corporation	T. J. Rushbrooke, Borough Surveyor, Easton-st., High Wycombe	do.
Street Works, &c.	Newmarket U.D.C.	S. J. Ennion, Deva Chambers, Newmarket	do.
Road Materials, &c.	Poole (Dorset) Town Council	J. Elford, Borough Surveyor, Poole	do.
Granite, &c. (2,000 tons)	Brentwood U.D.C.	C. E. Lewis, Council Offices, Brentwood	do.
Twenty Cottages, Western-road	North-Eastern Railway Company	W. Bell, Architect, North-Eastern Railway Station, York	do.
Station Buildings, North Skelton, Yorks	Mr. W. Thompson	S. Shaw, Architect, Kendal	do.
Additions, &c., to Moresdale, Grayrigg, Kendal	Balfax Corporation	T. Evans, Architect, Market Buildings, Craven Arms	do.
Additions to Tram Shed, Skircoat-road	Messrs. Todd Bros.	J. Lord, Civil Engineer, Town Hall, Halifax	do.
Business Premises, Crown-street, Darlington	Keighley Town Council	G. G. Hoskins, Architect, Darlington	do.
Alterations, &c., at Town Hall	Wadsworth and Clapham Union	W. C. Field, Borough Architect, Town Hall, Eastbourne	do.
Conveniences, &c., Sun-street and others	Newcastle-on-Tyne School Board	W. H. Hopkinson, Civil Engineer, Town Hall, Keighley	do.
*Extension of Board Room, &c.	Lochgelly (N.B.) School Board	W. H. Hopkinson, Architects, 38, Bow-lane, Cheapside, E.C.	do.
Schools, Henton	Nass (Ireland) R.D.C.	Lausdell & Harrison, Architects, 110, Pilgrim-street, Newcastle-on-Tyne	May 16
Schools, &c., Loughmama	Salisbury Charles Trustees	S. D. Robin, Architect, 110, Pilgrim-street, Newcastle-on-Tyne	do.
Sewerage Works, Kildare	Rev. J. D. James	W. Birrell, Architect, Cupar	do.
House and Shop, Butcher-row	Down District Asylum Commrs.	F. Berafin, Engineer, Kildare	do.
Vicarage, Cadoxton, Neath	Conway Guardians (Berby) R.D.C.	J. Harding & Sons, Architects, 58, High-street, Salisbury	do.
Hospital	Castle Donington (Berby) R.D.C.	J. W. Rodger, 14, High-street, Cardiff	do.
Additions to Workhouse, Bangor-road	Committee	S. Rea, District Asylum, Downpatrick	May 17
Surveyor's Materials	do.	T. B. Farrington, Architect, Trinity-square, Llandudno	do.
House, Coldholme, Aberdeen	do.	J. R. Newbold, Becket-street, Derby	do.
Public Hall, Curnwhiton, Carlisle	do.	J. Craig, 133, Union-street, Aberdeen	do.
Foundations for Hospital, Cardiff	do.	J. A. Ferguson, Curnwhiton	do.
Hospital, Cardiff	do.	E. W. M. Corbett, Architect, Castle-street, Cardiff	May 18
Two Houses, Billingshurst, Sussex	W. sleyan Trustees	do.	do.
Chapel, Marly, Wales	do.	W. Buck, Architect, Horsham	do.
Three Houses, Mardy, Wales	do.	J. L. Smith & Davies, Architects, Aberdare	do.
Additions to Premises, Head-street, Colchester	do.	do.	do.
Road Works, The Crescent	do.	J. W. Start, Architect, Colchester	do.
Sewers, &c.	Leatherhead U.D.C.	J. R. Harding, Civil Engineer, High-street, Leatherhead	do.
*Furniture	Bury (Lanes) Corporation	J. W. Bradley, Civil Engineer, Town Hall, Bury	do.
Roads, &c., St. Anne's Estate, Barnes	Buxton Lime Firms Co., Ltd.	W. R. Bryden, Architect, 1, George-street, Buxton	May 20
Five Houses, Rothwell-road, Halifax	East Ham School Board	Clerk, School Board Offices, East Ham, E.	do.
*Shops and Office Premises	do.	F. & W. Srocker, Surveyors, 90, Queen-street, Cheapside, E.C.	May 21
*Supplying and Fixing Lamps, &c.	Walthamstow Parochial Charities	R. Horsfall & Son, Architects, Halifax	do.
Eighteen Houses, Warley-road, Halifax	Egham Parish Council	W. A. Longmore, Bridge-chambers, How-street, Walthamstow	May 23
Water Supply Works	Carlisle Corporation	J. A. Spiller, Parish Council Offices, High-street, Egham	do.
Covered Way	Southwark Guardians	M. Hall, Architect, Halifax	May 24
*Alteration to Offices	do.	C. B. Newton, Civil Engineer, Victoria Viaduct, Carlisle	May 25
*School Buildings	West Hartlepool School Board	G. D. Stevenson, Architect, 13, Kings-street, E.C.	May 30
*Semi-detached Dwelling Houses	do.	do.	do.
Villa, Gakenshaw, Bradford	Mr. J. H. Field	School Board Offices, Park-road, West Hartlepool	May 31
Additions to Park Manor, Ulverston	Mr. R. W. Wakefield	S. Knight & Parkinson, 175, Temple-chambers, Tudor-st., E.C.	No date
Roofing Works, &c., Wakefield	do.	J. W. Bronghton, Architect, 19, High-street, Skipton	do.
Two Houses, Catcliffe, Rotherham	do.	Settle & Farmer, Architects, Ulverston	do.
Four Villas, West Bridgeford	do.	J. Rhodes & Sons, Limited, Engineers, Wakefield	do.
Villa Residence, Peuydarren Park, Merthyr	do.	G. H. Johnson, Architect, 38, High-street, Rotherham	do.
Additions to Church, Heale	do.	H. Alcock, Architect, Bentinck-buildings, Nottingham	do.
Six Houses, Mickley, Stocksfield	do.	E. A. Johnson, Architect, Abergavenny	do.
Two Villas, near St. Kilda's Church, Griffithstown	Vicar and Churchwardens	Brodrick & Co., Architects, Hull	do.
Works, &c., at Cottage Homes, Wednesfield	do.	Bidenoch & Bruce, Architects, 55, Pilgrim-street, Newcastle	do.
Offices, &c., Bush Hill Park, Enfield	Wolverhampton Guardians	M. Davies, Staffordshire-row, Griffithstown,	do.
Seven Houses, Ebbw Vale, Mon	Trustees	F. Harrison, St. Peter's Close, Wolverhampton	do.
Church Hall, &c., Leadgate, Durham	Lambeth Hayles Charity Trustees	Crickmay & Sons, Architects, 13, Victoria-street, S.W.	do.
Chapel, Beeston Hill, Leeds	do.	E. A. Johnson, Architect, Abergavenny	do.
*Artizan Dwellings	do.	J. E. Parker, Architect, Primrose House, Backhill	do.
do.	do.	W. A. Hobson & Co., Architects, 52, Alulton-street, Leeds	do.
do.	do.	See Advertisement	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Daventry R.D.C. ....	.....	May 14
*Clerk of Works	Wadsworth & Clapham Gurdns	3l. 2s. per week	May 15
*Architectural Draughtsman	Plymouth Corporation	100l. per annum	May 18
*District Road Surveyors (Four)	Nottingham Corporation	175l. per annum	do.
*Borough Engineer and Surveyor	Hampstead Borough Council	600l. per annum	do.
*General Superintendent of Roads	do.	200l. per annum	May 20
*Junior Civil Engineering Assistant	Shanghai Municipal Council	240l. per annum	do.
*County Surveyor	Gloucestershire County Council	250l. per annum	May 25
*Clerk	Lepton U.D.C.	60l. per annum	June 1
do.	do.	do.	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, pp. iv. vi. viii. x. & xxii. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.

PRICES CURRENT (Continued).

WOOD. At per standard. £ s. d. £ s. d. Dry Mahogany— Honduras, Tabasco, per ft. sup. 0 9 0 11 Selected, Figury, per ft. sup. as inch 0 1 6 0 2 0 Dry Walnut, American, per ft. sup. 0 10 0 1 0 Teak, per load 16 0 0 20 0 American Whitewood Planks— Per ft. cube 0 2 3 0 3 0 Prepared Flooring— Per square. 1 in. by 6 in. and 7 in. yellow, planed and shot 0 13 0 0 16 6 1 in. by 6 in. and 7 in. yellow, planed and matched 0 13 6 0 17 6 1 1/2 in. by 6 in. and 7 in. yellow, planed and matched 0 16 0 1 2 0 1 in. by 6 in. and 7 in. white, planed and shot 0 11 0 0 13 0 1 in. by 6 in. and 7 in. white, planed and matched 0 11 6 0 13 6 1 1/2 in. by 6 in. and 7 in. white, planed and matched 0 14 0 0 16 6

JOISTS, GIRDERS, &c.

In London, or delivered to Railway Vans, per ton. £ s. d. £ s. d. Rolled Steel Joists, ordinary sections Compound Girders 7 15 0 8 15 0 Angles, Tees and Channels, ordinary sections 9 7 6 11 7 6 Filch Plates 9 15 0 12 7 0 Cast Iron Columns and Stanchions, including ordinary patterns 8 5 0 10 0 0

METALS.

IRON.— Common Bars 8 10 0 9 0 0 Staffordshire Crown Bars, good merchant quality 9 0 0 9 10 0 Staffordshire Marked Bars 12 10 0 10 0 0 Mild Steel Bars 9 0 0 10 0 0 Hoop Iron, basis price 9 10 0 10 0 0 (* And upwards, according to size and gauge.) Sheet Iron, Black.— Ordinary sizes to 20 g. 10 5 0 11 0 0 " 22 g. and 24 g. 12 15 0 13 0 0 " 26 g. 14 10 0 15 0 0 Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. 12 15 0 13 5 0 " 22 g. and 24 g. 13 5 0 14 10 0 " 26 g. 14 10 0 15 10 0 Sheet Iron, Galvanised, flat, best merchant quality.— Ordinary sizes to 20 g. 16 10 0 17 0 0 " 22 g. and 24 g. 17 0 0 18 10 0 " 26 g. 18 10 0 19 10 0 Galvanised Corrugated Sheet.— Ordinary sizes, 6 ft. to 8 ft. 20 g. 13 15 0 14 0 0 " 22 g. and 24 g. 13 0 0 14 0 0 " 26 g. 14 0 0 15 0 0 Best Soft Steel Sheets, 6 ft. by 2 ft. and thicker 13 10 0 14 0 0 " 22 g. and 24 g. 13 10 0 14 0 0 " 26 g. 14 0 0 15 0 0 Cut nails, 3 in. to 6 in. 16 10 0 17 10 0 (Under 3 in. usual trade extras.) LEAD.— Sheet, English, 3 lbs. & up. 15 0 0 16 0 0 Pipe in coils 16 0 0 17 0 0 Soil Pipe 18 10 0 19 0 0 ZINC.— Sheet.— Silesian, tongue 24 0 0 25 10 0 Silesian, flat 23 10 0 24 10 0 COPPER.— Strong Sheet 0 1 0 1 0 1/2 Thin 0 1 2 0 1 3/4 Tin 0 1 4 0 1 5/4 SOLDER.— Plumbers' 0 0 7 0 0 8 Tinners' 0 0 8 0 0 9 Blowpipe 0 0 9 0 0 10 ENGLISH SHEET GLASS IN CRATES. 15 oz. thirds 3d. per ft. delivered. 24d. " " 21 oz. thirds 34d. " " 19 1/2 oz. fourths 34d. " " 20 1/2 oz. thirds 34d. " " 15 oz. thirds 4d. " " 32 oz. thirds 4d. " " 11 1/2 oz. fourths 4d. " " Plated sheet, 18 oz. 4d. " " 1/4 Hartley's Rolled Plate 3d. " " 1/2 " " 4d. " "

OILS, &c.

Raw Lined Oil in pipes 0 2 6 " " in barrels 0 2 7 " " in drums 0 2 0 " " in pipes 0 2 8 " " in barrels 0 2 9 " " in drums 0 2 6 Turpentine, in barrels 0 2 8 " " in drums 0 2 8 Genuine Ground English White Lead 24 10 0 Red Lead, Drum 24 10 0 Best Lined Oil Putty—per cwt. 0 9 0 Stockholm Tar 10 0 0

PRICES CURRENT (Continued).

VARNISHES, &c. per gallon £ s. d. Fine Elastic Copal Varnish for outside work 0 16 6 Best Elastic Copal Varnish for outside work 1 0 0 Best Elastic Carriage Varnish for outside work 0 16 6 Best Hard Copal Varnish for inside work 0 10 6 Best Extra Hard Church Oak Varnish for inside work 0 10 6 Fine Hard Copal Varnish for inside work 0 16 0 Best Black Japan 0 9 0 Best Hard Carriage Varnish for inside work 0 16 0 Extra Pale Paper Varnish 0 12 0 Best Japan Gold Size 0 10 0 Best Black Japan 0 16 0 Oak and Mahogany Stain 0 9 0 Brunswick Black 0 9 0 Berlin Black 0 15 0 Knottin 0 10 0 Best French and Brush Polish 0 10 0

TO CORRESPONDENTS.

A. S. (Amounts should have been stated). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article is given subject to the approval of the article, when written by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

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

DEVONPORT.—For alterations to business premises, No. 17, William-street, for Mr. C. F. Hocking, Mr. Edgar M. Leest, architect, Public Hall Chambers, Devonport. W. E. Blake 0 15 6 | Smith & Son 0 14 8 15 W. Littleton 0 5 6 | Jenkin & Son 0 4 7 5 G. B. Turpin 0 4 9 0

HUNSTANTON.—For erecting a residence at Hunstanton, Norfolk, for Mr. E. Dawbarn, Mr. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich. W. H. Brown 0 5 5 19 6 | W. F. Smith 0 14 40 15 F. Giddings 0 5 3 7 1 5 | F. Southgate 0 1 2 6 0 0

KIRKCALDY.—For the erection of sanitary conveniences at Pathhead Public School, for Dysart Burgh School Board, Mr. D. Forbes Smith, architect. Quantities by the architect:— Masonry.—Balfour Bros, Sinclairtown 0 5 50 6 3 Joinery.—David Wishart, Pathhead 0 28 8 0 Plumbing.—James Robb, Dysart 0 49 11 7 Slating.—Robert Page, Pathhead 0 5 10 0 Plastering.—H. Masterton, Sinclairtown 0 26 0 0 Total 0 159 15 10

KIRKCALDY.—For the erection of twenty workmen's houses at Boreland, for the Earl of Rosslyn's Collieries, Limited, Mr. D. Forbes Smith, architect. Quantities by the architect:— Masonry.—D. Wilkie, Sinclairtown 0 80 14 6 Joinery.—T. Miller, Kirkcaldy 0 5 9 0 Plastering.—Hutchinson, Sinclairtown 0 166 0 0 Plumbing.—James Robb, Dysart 0 15 14 9 Slating.—Currie & Cant, Kirkcaldy 0 100 0 0 Total 0 134 9 3

KIRKCALDY.—For the erection of a billiard-room at the Laurels, Sinclairtown, for Mr. David McLaren, Mr. D. Forbes Smith, architect. Quantities by the architect:— Masonry.—D. Wilkie, Sinclairtown 0 189 16 6 Joinery.—Hay & Son, Dysart 0 1 7 8 11 Plastering.—H. Masterton, Sinclairtown 0 5 15 0 Plumbing.—J. Crombie, Sinclairtown 0 15 10 6 Total 0 149 0 11

LONDON.—For the erection of ten detached houses in Shepherd's Hill, Highbate, for the Freehold and Leasehold Investment Company, Limited, Mr. Eugene C. Beaumont, architect:— Thos. Boyce 0 24 8 8 Lawrence & Sons 0 20 22 22 Noon & Co. 0 29 17 H. Brown 0 19 8 33 Adamson & Sons 0 21 26 4 Grover & Son 0 19 7 34

LONDON.—For erecting a dwelling-house and shop, Whitechapel, E. Mr. Ernest H. Abbott, architect, 6 Warwick-court, Gray's Inn, W.C. Quantities by Mr. Alfred Johnson, 34, Imperial Buildings, Ludgate Circus, E.C. 4.— G. E. Todd & Co. 0 17 23 2 A. E. Symes 0 14 5 Arthur Webb 0 9 8 R. & E. Evans 0 8 9

NOTTINGHAM.—For the erection of two houses and shop in Narrow Marsh, Mr. Fred. C. Martin, architect, Angel-row, Nottingham.— Wm. Maule 0 4 7 5 T. H. Harper 0 15 70 A. B. Clarke 0 6 4 7

PURFLEET.—For construction of camp-sheeting to new wharf at Purfleet, Essex, for Messrs. Otto Trechmann, Limited, Messrs. Wigg, Oliver, Hudson, & Co., architects, 80, Leman-street, E., and 7, Bedford-row, W.C.— Chafen & Newman 0 16 2 25

RUSHDEN.—For the erection of two houses, Higham-road, Rushden, for Mr. F. J. Abbott, Mr. H. Adnitt, architect, Rushden:— F. Henson 0 15 80 T. & C. Berrell 0 15 49 F. Hensley Bros 0 5 70 W. H. Sparrow 0 5 40 R. Marriott 0 5 59 H. Sparrow 0 5 40 T. Wilmott 0 5 59 E. Mitchell, Irchester 0 5 19 C. E. Bayes 0 5 49 T. Swindall 0 5 17

RUSHDEN.—For alterations and additions to shop and printing offices, High-street, Rushden, for Mr. W. Mark, Mr. H. Adnitt, architect, Rushden:— T. Swindall 0 13 70 H. Sparrow 0 13 0 T. & C. Berrell 0 3 2 E. Mitchell, Irchester 0 3 0 Whittington & Tonlin 0 3 19

WALSALL.—For nurse's home and out-patients' department, Walsall, for the Executive Committee of the Walsall and District Hospital:— F. Lindsay Jones 0 5 9 8 1/2 G. H. Marshall 0 5 1 3 2 0 Harley & Son 0 5 9 50 W. Hopkins 0 5 1 3 0 Wilcock & Co. 0 5 9 45 Sapco & Sons 0 5 9 48 T. Fildesley 0 5 9 9 5 W. Harvey Gibbs 0 4 8 30 S. Wootton 0 5 7 5 J. Mallin, West 0 5 7 5 W. Wistance 0 5 8 6 Bronnwich 0 4 7 90 W. & J. Webb 0 5 4 9 8

WATFORD.—For the construction of the main sewerage and sewage disposal works at Radlett, for the Watford Rural District Council, Mr. Ernest Lailey, Engineer to the Council:— Henry Brown, Watford 0 16 9 5 7 (Engineer's estimate, £7,100)

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

* Recommended for acceptance. BROCKLEY-ROAD.—Providing additional cloakroom accommodation for infants' department, raising the existing stone gateway in boundary wall to Beecroft road, and providing steps on playground side of same:— G. Kemp 0 12 50 H. Leney 0 12 10 Garrett & Son 0 2 7 H. Groves 0 1 2 J. & C. Bowyer 0 2 13 A. J. Acworth 0 1 26

GREENWICH (Divisional Offices Site).—Science Demonstration and Metalwork room on ground floor; Manual Training Centre on first floor, and enclosing, draining, and tarp-covering the additional land:— Bulled & Co. 0 4 5 500 Smith & Sons, Ltd. 0 2 6 6 64 J. & C. Bowyer 0 2 8 37 F. & H. F. Higgs 0 2 5 56 J. C. Randall 0 2 1 62 H. Appley 0 2 7 00 Holliday & Green 0 2 6 9 5 Wall & Co. 0 2 6 9 5 wood, Ltd. 0 2 5 8 8

HASELTINE-ROAD.—Enlargement—boys, 146 1/2 girls, 146 1/2 infants, 146. Total, 438. Providing new classrooms of 50, 50 and 40 for each department, new cloakroom for each department, and two new staircases for boys, converting existing boys' staircase for use of girls. Providing two new water-closets for each department, and new division wall between boys' and girls' and infants' playgrounds, and refixing covered playground for girls and infants. Rebuilding boys' water-closets and urinals. Providing storeroom and extending beating apparatus. Heating by open fires. Revised accommodation—boys, 266 1/2 girls, 266 1/2 infants, 622. Total, 1,515 1/2. Garrett & Son 0 2 9 4 4 1/2 F. & H. F. Higgs 0 2 8 6 3 6 Kirk & Randall 0 2 0 9 5 Holliday & Green 0 2 0 9 5 Johnson & Co., Ltd. 0 2 7 5 6 wood, Ltd. 0 2 3 9 5 Lawrence & Sons 0 2 7 3 2 J. & C. Bowyer 0 2 3 5 3 Bulled & Co. 0 2 6 7 1 Mitchell & Sons 0 2 7 3 2

KINGSGATE-ROAD SITE.—Providing and fixing fencing, &c.:— Bristow & Eatwell 0 1 7 9 0 Hawkins & Co. 0 1 8 3 0 J. & W. T. Hunter 0 8 5 10

MANSFORD-STREET.—Altering the position of two sliding glazed partitions, and providing an additional similar partition in place of a revolving shutter, in order to more equally divide classrooms B, C, D, and E, infants' department. Replacing the revolving shutters between the same rooms, and a half with fixed glazed framing:— J. F. Holliday 0 3 7 1 0 J. & C. Randall 0 3 3 0 0 H. Appley 0 3 3 0 0 Stevens Bros 0 3 0 5 0 Croom & Co. 0 3 0 5 0 F. & J. Wood 0 2 5 0 0 Williams & Son 0 3 1 8 1 E. F. Barker 0 2 5 0 0 J. G. Barker 0 2 5 0 0

[See also next page.]

Repairing furniture, &c., at the following schools:—

Table with columns for Contractors, Sydenham Hill-road, Olga-street, Canterbury-road, Cobourg-road, Surrey-square, Tennyson-street, Netherwood-street, Essex-street, and a final column with &c., POST, and ED.

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"MILLBANK."—Providing and fixing complete low-pressure hot-water apparatus to ten classrooms, two halls, drawing classroom, cloakrooms, corridors and lavatories (boys and girls) in graded school:— Wippell Bros. & Row .. £590 Wontner-Smith, Gray, G. Davis 536 Stevens & Sons 572 Kite & Co. 495

PONTON-ROAD.—Rearranging and refitting with separate pans the boys' and infants' offices in the playground, and girls' offices on roof playground; providing necessary drains for baths and lavatories, &c., in connexion with proposed industrial school and new drainage scheme:— G. Kemp £2,316 0 R. P. Beattie .. £2,683 9 5 Lorden & Son 2,222 0 Peattie Bros. .. 1,983 10 0 Johnson & Co. .. 2,142 0 H. Loney* .. 1,880 0 0

"PULTENEY."—Altering the position of an existing partition and providing a new glazed partition in order to divide classrooms A and B, infants' department, into three rooms; also altering the stepped flooring in two of the rooms so as to obtain left lighting, and forming two new classroom doorways in connexion therewith, &c.:— Lathey Bros. £267 R. S. Buckridge £192 General Builders, Ltd. .. 257 Barrett & Power* 192 M. Pearson 270

ROTHERHITHE NEW-ROAD.—Providing a drawing class room, balance-room, and lecture-room over boys' covered playground:— J. Appleby £2,160 W. Downs £1,945 Bulled & Co. 1,996 Maxwell Brothers, Ltd. 1,850 T. L. Green 1,985 W. V. Goad 1,825 Holliday & Green-wood, Ltd. 1,966 E. Triggs* 1,790 Marsland & Sons .. 1,950

SANTLEY-STREET.—Providing and fixing complete low-pressure hot-water apparatus for three halls, eighteen classrooms (boys', girls', and infants' departments), drawing classroom, corridors, cloakrooms, and lavatories:— Cannon & Sons £989 Williams & Sons, Cardiff, Ltd. £650 Wontner-Smith, Gray, & Co. 748 Defries & Sons, Ltd. ... 579 Dargue, Griffiths, & Co., Ltd. 728 G. & E. Bradley 565 J. & F. May 720 The Brighton's Foundry and Engineering Co., Ltd. 553 J. Esson 695 Duffield & Sons* 535 Oldroyd & Co., Ltd. ... 690

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The Builder.

VOL. LXXX.—No. 3041

MAY 13, 1905.

ILLUSTRATIONS.

Proposed Cathedral of St. Anne, Leeds.—Mr. J. H. Eastwood, A.R.I.B.A., Architect	Double-Page Ink Photo.
Additions and Alterations at Tissington Hall, Derbyshire.—Mr. Arnold Mitchell, F.R.I.B.A., Architect	Extra Large-Page Photo-Litho.
Welburn Hall, Yorkshire.—Mr. W. H. Drierley, Architect	Single-Page Photo-Litho.
School, Oxford.—Mr. Leonard Stokes, F.R.I.B.A., Architect	Single-Page Photo-Litho.
Stable Buildings and Coachman's House, Cavenham.—Mr. A. N. Prentice, A.R.I.B.A., Architect	Single-Page Photo-Litho.
House, De Pary's Avenue, Bedford.—Mr. A. N. Prentice, A.R.I.B.A., Architect	Single-Page Photo-Litho.

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The Technical Instruction and Secondary Education Bill.



THE readers of this journal well know that long before the present interest in Technical Education arose we advocated a more systematic teaching of the subject.

The present interest arises largely from fear. Englishmen have been told that foreign competition is now more formidable because the youth of this country is not properly equipped by technical education to compete with Germans and Americans. The people are therefore preparing to pay for the education, but somewhat less willingly than they do for guns and soldiers. This is one of the first points which must strike any one who considers the Government Bill on the subject of technical and secondary education. The Education Authority is to be allowed to levy a rate of twopence in the pound; if that is insufficient for a satisfactory system of technical and secondary education, so much the worse for education. The School Board has an unlimited power of rating for the purposes of elementary education, and the rate varies in most places from sixpence to ninepence. It is, therefore, perfectly obvious that the limitation in the Bill is inserted by the Government because the English people are prepared only to pay a limited sum for this purpose of secondary and technical education. This limitation is a very distinct blot on the new Bill; it will be a hindrance to satisfactory work, and it will be a drag on education. But we fear that it will remain in the Bill. By its means the Government hope to have a better chance of passing it into law. To those who object to the payment of rates, and prefer ignorance to education at a considerable cost, the Government will say, "See how cheap it is; it will cost you next to nothing." This is the way we legislate in this country.

We now come to the question of the educational authority. It has been pointed out many times in these columns that the County Councils were becoming more and more the most useful and the most dominant bodies in the country. Many of them show a breadth of view and an administrative grasp which is quite admirable. Many of them have employed the Technical Instruction Acts to very good purpose. It is, therefore, most satisfactory that the County Councils, with co-opted assistance, should be the new Educational Authority. It has been well said that the Bill, if it become law, will give local option in this respect to secondary and technical education. We do not feel much fear on this point. There is a good deal of competition between counties and County Councils, and on the whole the County Councils may be relied on to have a fair system. The members of these bodies are men, as a rule, above the average in education and intelligence. They are the pick of the country. They show signs of progress in the work of administering the highways and other matters. There is no reason to suppose they will be behindhand in regard to technical and secondary education. But there is the fatal financial limitation. There can be no doubt that however desirable technical education may be, a sound secondary education is equally, if not more, necessary. But this implies large schools, and numerous, capable, and well-paid teachers—such schools being placed systematically in the several counties. By this means the more capable scholars in the elementary schools would move automatically upwards, and from these secondary schools the scholars would turn into the practical business of the country. The great railways, the great building-houses, would know where to look for a supply of well-educated employés. But money must be found for the purpose.


Another point in the Bill which requires careful consideration is the position of the existing secondary schools. It does not seem that the educational authority will have an influence upon the grammar schools of the country, many of which, are purely

secondary schools. These schools will have a very anomalous existence. They will neither be part of what we call in this country—much to the bewilderment of Americans and Colonials—the public school system, nor of the county secondary education system. Many of these schools give a feeble classical education, whereas they should—while not dispensing with classical education—give also an education more technical and more modern. It would certainly be desirable that the smaller grammar schools, at any rate, should fall under the management of the County Councils. They would gain new life, and be a valuable adjunct towards a more complete and national system of technical and secondary education.

We have said nothing about what is now known as the Cockerton judgment, by which it was decided that it was illegal for Board Schools to give free education in technical and secondary education to schools without a fee. This point is dealt with in the Bill by allowing such teaching to be continued subject to the approval of the new Educational Authority. This is regarded as a temporary expedient. It may, however, become permanent. For it would be very convenient in many places if the secondary education could be brought close to the primary education. This point is likely to receive practical development. We have constantly pointed out that a sound system of primary education is the basis of all technical education, if the latter is to be worth anything. The Bill does not touch this question—oddly, and unfortunately, there is still mixed with elementary education the religious bogey, largely used by the clergy, because they wish to keep some personal authority over the voluntary schools. Once, however, the County Educational Authority gets to work, we believe that in those places where there is not now a strong elected educational body there will be a desire on the part of the people to see elementary education placed in the hands of the County and Borough Educational Authority. We can imagine nothing more absurd, nothing more likely to

offend English common sense, than that in some town there should be a Town Council managing a system of technical and secondary education while the primary education is in the hands of a vicar, churchwardens, and a few voluntary subscribers, who are at their wits' end how to make both ends meet. There will be many such instances, and they must cause public opinion to desire that the new authorities should have the power, sooner or later, of becoming the sole educational authority. It would be a great service to elementary education, and so to technical education, if many of the wretched little School Boards and small voluntary managing bodies could be absorbed by the County or Borough Council. But the main points which, finally, we desire again to emphasise are that this Bill creates an authority all over England for technical and secondary education; that it has the power of levying a rate for this purpose, to which will be added certain monies now used for technical education; that it rests with each locality, be it county or County Borough, to create a systematic series of schools for technical and secondary education. There are minor points which might be discussed, such as the amount of control to be exercised by the Board of Education; but it appears to be desirable to present to our readers the broader aspects of this most important change.

FRENCH ART IN 1901.—I.

 THE Old Salon is on the whole a better exhibition than for three or four years past. It suffers, of course, both in the actual quality of its contents and in its effect on the visitor, by the immense extent of wall space and the immense number of works that are hung. The range of galleries appears, as far as one can compare by recollection, even larger than that in the old Palais de l'Industrie; the natural consequence is that many pictures have to be accepted merely to fill the walls, which in a smaller exhibition would be excluded as below the mark, and that the eye is almost bewildered and fatigued in the effort to pick out the fine things from such an immense mass of paintings. On the whole it may be said that the proportion of good to bad or uninteresting works is higher at the Royal Academy than at the Salon, but the actual numbers at the latter exhibition are so much greater (2,092 oil paintings against 923 at the Academy) that a larger number of fine works could be culled from among them, including some few, certainly, which are superior in power and interest to anything in our London exhibition. Also, of course, we find some of those monstrous and repellant vulgarities or cruelties on a large scale which French art alone seems to produce, and French taste alone to tolerate. M. Lalire contributes his usual huge hash of contorted nakednesses; M. Surand paints, on a very large scale, the pleasant subject of Caligula feeding his lions and tigers on living criminals; M. Danger represents Pestilence ("Fléau") by a naked giant, the height of the houses, walking down a street like Gulliver among the Lilliputians, and knocking the inhabitants over with a club; and M. Chocarne-Moreau, in "La Main Chaude," perpetrates a piece of sheer vulgarity which is honoured with a place in the great gallery.

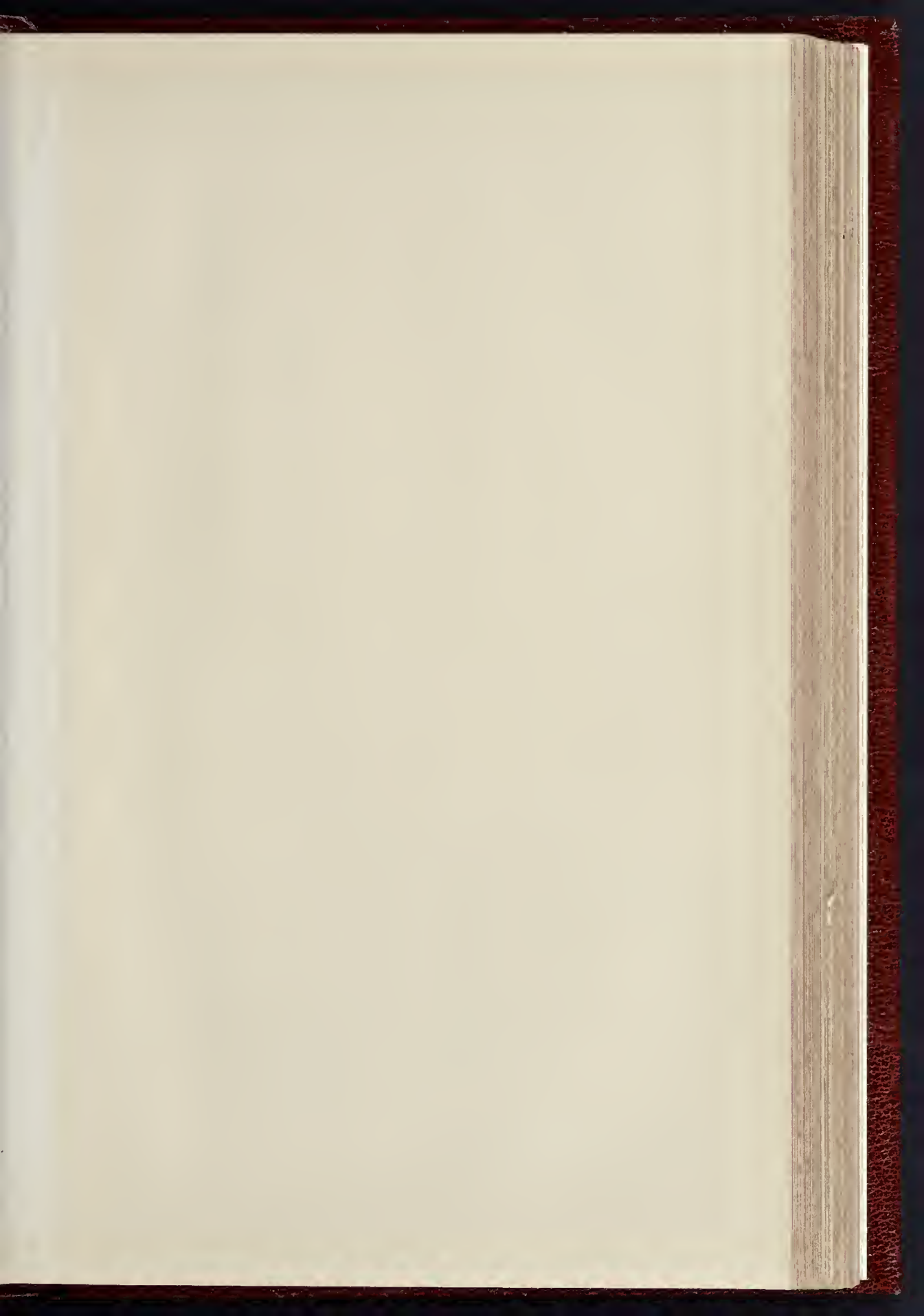
It is satisfactory to feel that such examples of brutality, absurdity, and vulgarity in art would at all events not find a place in any English exhibition.

In the aforesaid large gallery, to which the main staircase leads up, are of course collected those enormous canvasses which are a special characteristic of the Salon. Prominent among them is M. Bérourd's "Paradis Perdu," in which a colossal Adam and Eve, respectively brown and white, descend a rocky slope from the gate of Eden; a very theatrical work, and yet not without a certain power which grows upon you. M. Bonnat has a large ceiling painting, an allegorical representation of "Justice," intended for the first Chamber of the Cour d'Appel at Paris; it is painted in a curious method, with a criss-cross of brush strokes making it look like a huge pastel; it is totally unsuited for a ceiling, being far too heavy in colour, and when in position the seated figure of Justice will be horizontal instead of upright. A painting like that on a ceiling upsets all one's ideas of the wrong and right way up of things. Now, M. Marioton, in the opposite corner of the gallery, a confirmed ceiling-painter, knows what to do with a ceiling; his "Symphonie des Fleurs" is bright and aerial in colour, and the figures seem to float and not to stand. M. Ferrier's ceiling painting for the foyer of the theatre at Nîmes has also a fine quality of the same kind, and will look well in position, and there is a great charm in one or two of the figures. M. Chalon's "Phryne aux Fêtes de Venus" is uninteresting, nor has Phryne that beauty which would be the best excuse for the picture. M. Thomas's "Les Bergers," a decorative classic landscape and figures for the Mairie of Tours, is an imitation of Puvion de Chavannes without his brightness and delicacy of tone. Mr. Smith-Lewis exhibits here too his usual immense farm painting with unkempt horses the size of life, redeemed from artistic nothingness by a certain boldness of brush work. What a contrast to all the more or less violent works is M. Benner's calm and idyllic sacred picture, "Retour de la Fontaine," the Virgin with the infant Jesus walking before her; there is a simple and pure beauty about the child which is delightful. Also may we note with sympathy M. H. Flandrin's "Jeanne d'Arc en prière," kneeling with a sympathetic circle of spectators around her; there is more character in the faces of the spectators than in that of the principal figure, but it is a fine work in feeling, painted for the church of Sèvres, and having something of the severe style proper to a church painting, which must to a certain extent be regarded from a decorative point of view.

All these, and others, are in the great entrance gallery. From out of the rest of the long range of galleries, what can one select as of special interest? A selection it must be, for after all said, there are more interesting or clever pictures than one could have space to name in this article. The popular sensation of the year is M. Rochegrosse's triptych of Solomon and the Queen of Sheba, an exceedingly clever work in a superficial way; that is, the interest consists in the painstaking and brilliant manner in which a profusion of Oriental details of dress, ornament, and architecture has been painted, and the originality of invention displayed. It is a moderately large painting framed between

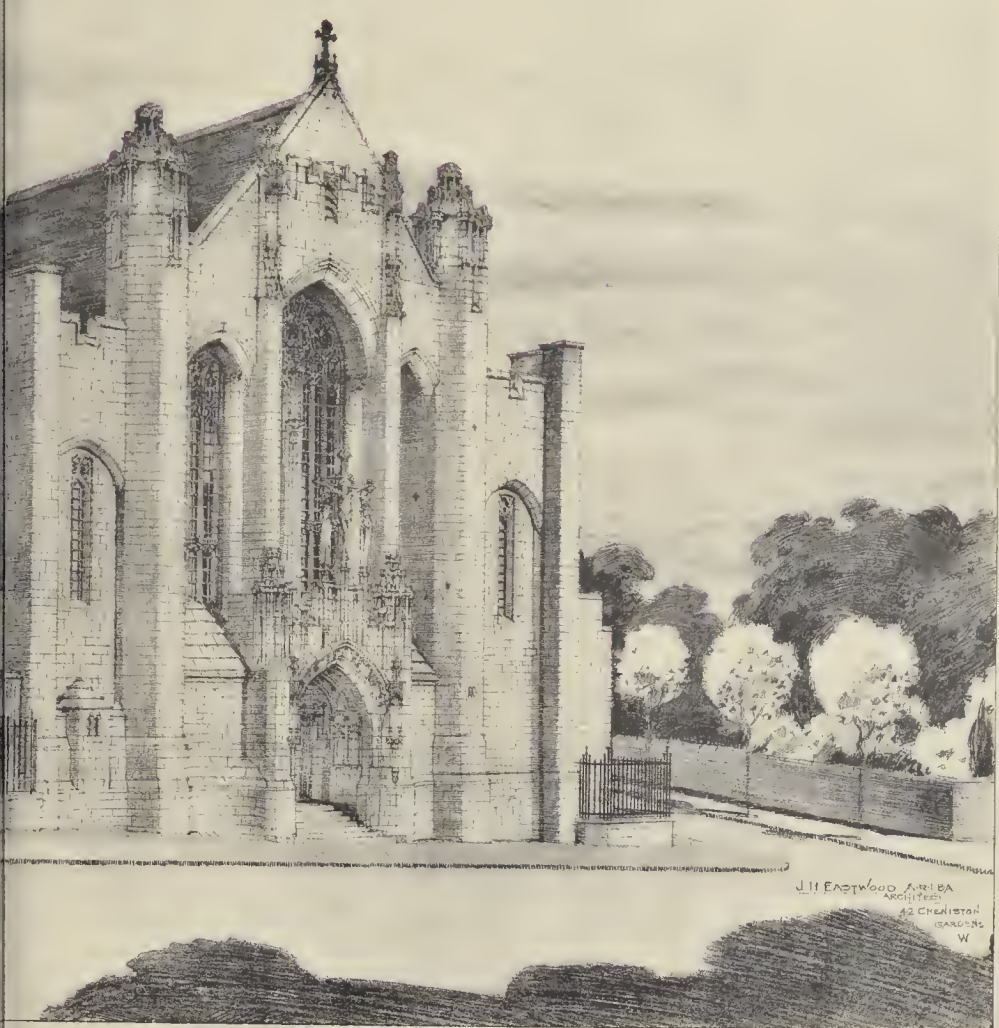
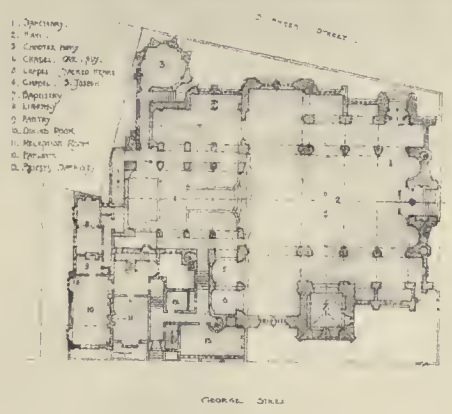
two small uprights; on the left the Queen of Sheba solitary on her own throne, on the right her introduction into his harem by the king (which it appears is one form of the legend), in the centre her reception in state by Solomon. There is admirable detail in this; the helmets of the cavalry guard, for instance, are delightful; but it perhaps hardly rises higher than what may be called a superior piece of bric-à-brac painting. The specially-designed symbolic frame is a curiosity in itself. Perhaps the two most important of the pictures in which figures are the prominent subject are M. Gervais' large painting of "A Fête in Honour of Bacchus and Ariadne," and M. Henri Martin's "Bucolique." The former is a large open-air scene with a crowd of Greek figures, some grouped around a term-figure of Bacchus with a fire on a small altar before it, others coming in procession along the cliffs, with flowers and musical instruments, the whole backed by blue sea and hills in clear light. The painter has thoroughly caught the spirit of Greek Paganism, and there is a great deal of fine drawing and fine colour in the work; but compared with some of his previous works the figures seem a little hard and artificial. M. Martin's picture, painted in his usual peculiar touch-upon-touch method, which makes the texture of his pictures different from those of any other painter (no one seems to have thought of imitating him yet), is as completely Christian as the other is completely Pagan. It is a scene in a sloping partially wooded glade, on the right of which, among the sheep, are some figures of rustics and their children, on the left approach two floating figures which seem as the guardian angels of the pastoral life. There is great deal of tender and pathetic feeling in the human figures, and the whole picture is equally pleasing in a decorative and in what one may call a moral sense; there is a certain holiness about it.

M. Bouguereau, alas! exhibits that foolish and weak piece of prettiness which has already been seen in London at Messrs. Tooth's Gallery, "Amour voltigeant sur les Eaux;" a sad piece of stuff for an eminent painter to put forth as his principal work of the year; a fancy destitute of point or meaning, and cold in colour; redeemed only by good drawing. He exhibits a good portrait also, but with the same characteristics of hard surface and cold colour. Among the other figure pictures of this class one may distinguish between the merely vulgar nudes, coarse in execution and devoid of sentiment of any kind; the innocent healthy nudes, prompted by an honest delight in the figure; and the paintings in which the nude figure is made the medium of expressing a poetic ideal. The first class may be dismissed from notice—there are plenty of them, twisted into various contortions. Of the second are M. Chantron's pretty, but senseless and rather hard painting, "Les Nymphes s'amusement," and M. Nicolas Laurens' curious fancy of symbolising the fall of the leaf by three nude figures seated or clinging to a tree, and ready to drop off from exhaustion. Possibly the artist would claim that this came under the head of poetry, but it is too odd and far-fetched an idea to appeal much to one in that sense. M. Sezille's "Madeleine" is one of the best painted nudes, prostrate at full length, and hung so as to incline towards

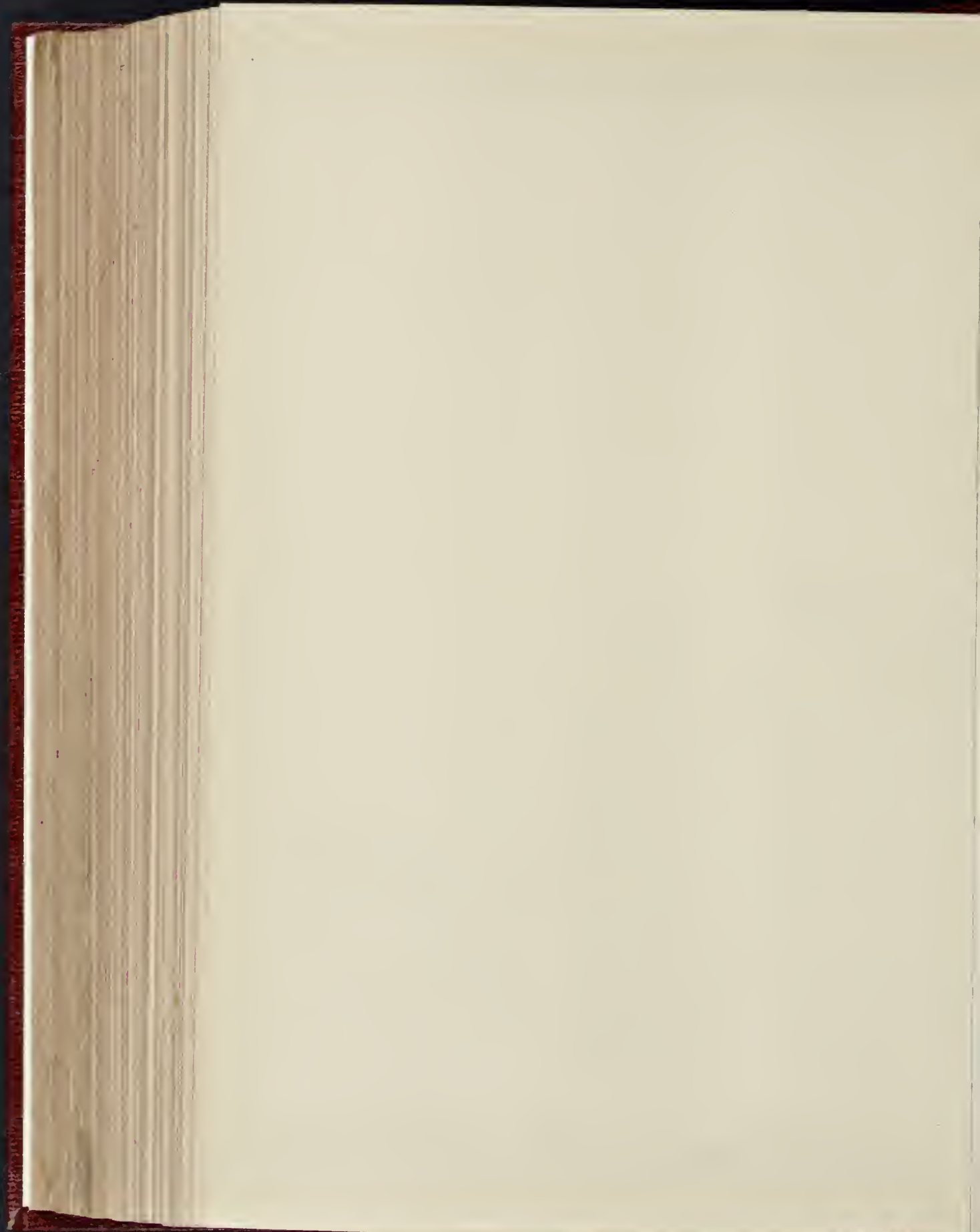


PROPOSED CATHEDRAL
OF S. ANNE, LEEDS. *





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Home Arts
and
Industries.

THE annual exhibition of the Home Arts and Industries Association is now open at the

Royal Albert Hall. The best work of the Association lies in developing local industries where they already exist, awakening the interest of workers in design, and showing them the best models and methods of work; where nothing of the kind exists, classes are started of a useful and instructive nature. We always wonder at these exhibitions that we see no carpentry exhibits. Good simple carpentry is an uncommon accomplishment; it is not showy, but it is very useful and is the high road to a right appreciation and perception of more beautiful things. The best wood-work exhibits are amongst the inlay work, especially that of Miss Mabel de Grey from Pimlico, whose very clever work is within the limits of the material and the bounds of good design. A very good chair and music cabinet come from Bolton-on-Swale. Of a great deal of wood carving there are some good panels from Altrincham; the majority is poor and useless. The fact is that carving is out of place on the ordinary furniture of a house, and in perfection is only found in conjunction with architecture. Interesting architecturally are the terra-cotta exhibits from Compton, most of them from the designs of Mrs. G. F. Watts; they consist this year chiefly of useful garden ornaments—flower-vases, urns, and decorative work of an allegorical nature. In the needlework and fabric section the strongest work is that from Haslemere by Mr. and Mrs. Godfrey Blount, appliqué work in rich coloured lins of their own weaving and design, essentially modern in character. The tapestry from Aldeburgh, Suffolk, is very beautiful both in colour and design, and is the work of crippled girls. Incidentally the Association finds employment of a worthy character for cripples, the blind, and disabled soldiers and sailors.

A CORRESPONDENT, an architect, writes to us to draw attention to the fact that the Mayors' chains and badges which are being presented to some of the newly created London Boroughs are being, as he puts it, "executed by limited liability companies;" that is, they are the production, not of artists, but of trading firms. That is the usual way in England, and it will probably be some time before we see anything better, except in rare instances. Our correspondent adds that he was looking at one of these when another person came up and remarked "There's a lot of gold in that; it must have cost 200*l.*" That is the English standard of value in such matters—"a lot of gold." What kind of design is made out of the gold is of no consequence, so long as the bullion value reaches a respectable figure.

JOINT HOSPITAL, CHORLEY, LANCASHIRE.—The new isolation hospital at Heath Charnock, near Chorley, has just been opened. There are five buildings—the administrative, the working, the scarlet fever, the typhoid, and the diphtheria blocks. Each of the buildings of the hospital proper has a glass verandah. The working block contains the disinfecter house, the laundry, the mortuary, stables, and the ambulance house. The buildings stand within an enclosed area of something over six acres. The architects are Messrs. Jolly & Buckley, of Chorley; the contractor, Mr. Robert Brownley, of Chorley, with Mr. L. Fairclough, of Adlington, as sub-contractor for the stonework; Messrs. J. Fairclough & Sons for the slating and plastering; and the executors of Mr. Heald for the plumbing, painting, and the glazing.

THE ARCHITECTURAL ASSOCIATION:
SPECIAL GENERAL MEETING.

A SPECIAL general meeting of this Association was held in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, W., on Friday last week, at 7 p.m., to consider the Committee's proposals to add to or amend the following by-laws—

To add to By-law 27: "The Committee shall appoint four trustees, who shall be members of the Association, in whose names the investments belonging to the Association shall be invested on behalf of the Association. Any vacancy in the number of trustees shall be immediately filled by the Committee."

[The Committee of the Association recommended the names of the following gentlemen to act as trustees: The President (Mr. W. H. Seth-Smith), and Messrs. G. H. Fellowes Prynne, Arnold Mitchell, and G. B. Carvill.]

By-law 26: After "Treasurer" add "or Secretary."

By-law 27: After the words "shall be paid by the Treasurer" add "or Secretary."

By-law 33 to read: "The office of President, Vice-President, or Librarian shall not be held by any member for more than two consecutive sessions. The office of Treasurer and Hon. Secretaries shall not be held by any member for more than five sessions and four sessions respectively."

The President (Mr. Seth-Smith) occupied the chair, and moved the adoption of the committee's proposals. In reference to By-law 33, he said that the Committee considered it objectionable on principle that offices of great responsibility should be held very long, and that it was far better to get fresh officers periodically.

The proposals having been agreed to the special meeting terminated, and the ordinary meeting commenced.

The minutes having been read and confirmed, some nominations having been read, and some donations to the library announced.

The Chairman said he proposed with much pleasure the names of Mr. Ernest George and Mr. J. M. Brydon for election.

These gentlemen having been elected by acclamation. The Chairman announced that the annual dinner would be held at the Criterion Restaurant on Friday, May 31. The Committee desired to make the dinner a thorough success this year with the special view of saying what could be said as to the new educational departure the Association was taking, viz., the establishment of a Day School. It was hoped, therefore, that there would be a good attendance at the dinner.

Messrs. Ralph Berrill, A. E. Chasemore, A. D. Jenkins, J. H. Cooper, and J. H. Shearer having been elected members of the Association.

Mr. R. S. Balfour, Hon. Secretary, announced that a visit would be paid to Chesterfield House, South Audley-street, on the 18th inst., by permission of Lord Burton.

Mr. Alfred Hands, F.R.Met.Soc., then read the following paper:—

The Protection of Buildings from Lightning.

The popular idea of lightning comprises little more than that it is something stored up in a thundercloud which is apt to leave it and travel to earth, doing damage to objects which obstruct its course; that it is attracted to and conducted by metals; and that when it reaches the earth it disperses or becomes lost, more especially if it gets to water. These ideas give a very incorrect view as to what the problem involved in protection from lightning really is. As a consequence, it is popularly supposed to be a very easy one. All that is thought to be necessary is to have a lightning-conductor raised sufficiently high to attract the lightning; it must be of large size to allow an easy path for the discharge, and its lower end must be taken into moist ground or into water, and there the matter ends. This view also contains an element of truth, but it is very far from being the solution of the problem. Instead of being a simple matter, protection from lightning is a most complex subject, and probably one of the most difficult among the many which architects are called upon to deal with in the course of the erection of buildings.

I cannot within the narrow limits of a paper place before you the whole subject, but I hope to be able to show something of the principles which are involved, and more especially as to the common-sense view, for,

although it is very often ignored, there is such an aspect. I think that little could be said in favour of lightning conductors if they would not bear the searching light of common sense. It is not a subject which can be taken up lightly and disposed of in a few words, and a thorough knowledge can only be obtained by very close study, exhaustive experiments, a careful investigation of the phenomena exhibited by nature when objects are damaged by lightning, and a very extensive experience of the questions to be considered in the protection of buildings. It is a subject which, when one has studied superficially, one is apt to consider easy and that one has mastered, but that after studying in all its bearings for a few years one finds it very much more difficult than one thought, and requires long and close application before it can be thoroughly mastered. There are so many subjects which it is necessary for architects to be thoroughly conversant with that I think few could spare the time necessary to render themselves experts in this one. At the same time it is advisable that they should know something of the principles involved, for until they do, cases of so-called failure of lightning conductors, which are far more frequent than they should be, will continue to occur.

The subject is, I consider, a most important one, because, apart from human life being at stake, a vast amount of property is annually destroyed by thunderstorms—losses which could be prevented by a scientific application of conductors which would render their destructive effects nugatory. It is impossible to arrive at the amount of damage to property which occurs yearly in this country, but I believe I am below rather than above the actual figures in saying that it must be between 50,000*l.* and 100,000*l.* I have for many years been collecting particulars of damage of this nature, but I do not suppose that my record is anything like a complete one, because the list of papers searched has necessarily been limited, and besides there are very many cases which are not reported, even in the local Press—every year many unreported cases have been brought to my notice. From these particulars I am at present preparing a map of England showing the positions and nature of the objects struck. This work takes considerable time if one desires to be accurate, and I have at present only completed from the beginning of 1898 to the present time, but thinking it might be of interest to you I have prepared a copy. This map has spots of various colours representing buildings, ricks, trees, and other objects damaged or destroyed, and human beings and animals killed or injured. I particularly wish to draw attention to the fact that most of our large towns, and particularly the manufacturing ones, are indicated by the number of cases of damage; I think this ought to dispose of the mistaken idea sometimes expressed that the smoke in towns acts as a protection.

I do not propose going into the question of the origin or process of formation of thunderstorms, but in order to understand the principles involved in the science of protection, it is necessary clearly to understand the electrical action in a storm of this kind. You are aware, of course, that lightning is merely electricity differing in no respect from that generated by a frictional or influence electrical machine, except that it is on a gigantic scale. You are also doubtless aware that this form of electricity called static is of a dual nature generally called positive and negative; that it is impossible to produce one without the other, and that by a process called induction, where the one state is existent the other will be near it, being only prevented from joining by whatever insulating material is interposed. The existence of one electrical state is proof of the existence of the other, and that it is as near as the insulating material will allow it to get. This is precisely what occurs in a thunderstorm. The storm clouds provide the charge of one nature, and the earth with the buildings and other objects on it has by induction the other—the air between is the insulator which tends to prevent their joining. Of course, it frequently happens that different clouds in one storm are oppositely electrified, and hence we get flashes from one cloud to another, but as these discharges do not affect our safety, we may leave them out of account. Presuming that the cloud is positive, the earth and the objects on it are necessarily negative, and therefore there is a state of tension between the two which becomes more acute as the

respective charges increase, until at last the tension becomes too great, the insulating material gives way, and momentarily the path of the strain becomes visible by a line of matter rendered incandescent, and this we call lightning. The strain has existed before the flash appears, and the path it follows is all prearranged. One cannot say that anything has left the cloud to come to earth, any more than that something has left the earth to travel skywards. It is merely the re-uniting of the two states, or rather the restoring of the equilibrium which had before been disturbed.

Franklin at one time used the terms plus and minus in place of positive and negative, and they are in a way convenient; but it will be more correct, and, I think, more simple, if we treat the matter merely as a difference of potential, for one state is only negative or minus relatively to the other. Adopting the terms plus and minus for the moment, however, we may say that if we regard a mild so-called positive charge as +1, the corresponding negative charge would be -1; or a more powerful positive charge as +1,000, the negative would be -1,000. In either case the total of the two joined would be 0, or a state of quiescence, and the difference between the two values +1 and -1, and +1,000 and -1,000 respectively, would represent the difference of potential. But it is not necessary that difference of potential should be above and below zero, it may be all on one side, thus it may be compared to the difference between +1 and +2 or -1 and -2. Now, wherever a difference of potential exists there is a strain due to the necessity of restoring the equilibrium or level, and if the strain is great enough to break down the insulating material, a spark will pass. Therefore, if we could do away with the strain, or reduce it in time, we should prevent the breakdown, or in other words prevent the discharge taking place, and this is what we endeavour to do when we provide a lightning-conductor with points. They possess this power; they may almost be considered as safety-valves. While the potential in the clouds is being raised in the process of the formation of the storm, every point is reducing the strain by what is called brush or silent discharge. Theoretically, a lightning-conductor should never be struck by lightning; practically, it may be because the potential may be raised so rapidly that the points cannot reduce the strain quickly enough. Points, however, possess a very considerable protective effect and form a most important function of a lightning-conductor, although not absolute. The conductor might even be so far inefficient that it would not convey a lightning discharge harmlessly and yet the points would still exert their protective effect in this way. During a thunderstorm the points of a conductor may frequently be seen to glow with the light of the brush discharge, and this may even be concentrated into short sparks or a spitting effect, as Professor Lodge graphically put it. Then we hear people say they have seen the lightning playing about the lightning-conductors. When this occurs the tension must be enormous, and it is just a question whether the lightning flash will occur or not.

If the points are not able to prevent discharge, the second function of the lightning-conductor, its power of conduction, should prevent any harm occurring to the building on which it is fixed if it has been applied on scientific principles, but it is just in this that the complicated and difficult nature of the matter consists.

I think it will make the matter clearer if I digress to touch briefly on what may be called the principal epochs in the history of protection.

It has been claimed that the invention of the lightning conductor was complete in its first inception, like Minerva springing into being from Jupiter's head; but this is very far from being so. When, in 1752, Benjamin Franklin established the identity of electricity and lightning, he immediately suggested the possibility of preventing the damage which this force caused to buildings. Knowing the effect of a point in neutralising an electric charge, his original idea, I am inclined to believe, was that buildings should be provided with a metal point on the highest part and that this should have the effect of preventing their being even attacked by lightning. The necessity for having a continuous conductor of metal from the point to the ground became evident, but this also was found to be insufficient. Then he realised that it was necessary

to have the conductor carried deep enough into the ground to be in connexion with conducting earth—that is to say, moist earth or water. So the idea of the lightning-conductor as regards its main principles was evolved. Buildings in Franklin's day were easy to protect; those of to-day are very different.

The next important epoch was when William Snow Harris became interested in the subject, more especially as regards the protection of ships from damage by lightning, the losses sustained from this cause both by the Royal Navy and the mercantile marine being at that time very considerable. Snow Harris succeeded in getting his system of protection adopted by the Admiralty, and became the premier authority of his day on this subject, ultimately receiving the honour of knighthood for the services he had rendered. Many of our important public buildings were protected in accordance with the plans and specifications of this distinguished scientist, and no case of failure occurred to show that he had blundered. I have had the opportunity of examining some of the buildings fitted in accordance with the plans of Sir William Snow Harris, and have been particularly struck with the thoroughness with which they had evidently been studied. One could clearly see the master mind in the way in which the work had been done. Snow Harris advocated copper as being the best conducting and most durable metal, and therefore the most suitable for lightning conductors. His system, which generally comprised a number of conductors on one building, was to connect all the metals about the structure to one another and to the conductor system so as to bring the whole mass into a state of uninterrupted conduction. A most interesting controversy took place between Mr. C. V. Walker, F.R.S., who was at one time President of the Meteorological Society, and Sir William Snow Harris on the question of side-flash or lateral discharge. Walker contended that sparks might pass between a lightning conductor and other metals about the building adjacent to it. Snow Harris made a distinction between metals which were earth-connected and would therefore form alternative paths for the discharge, and insulated metals which would not assist its passage to earth. He argued that while there would be a division of the discharge between the conductor and the alternative path, sparking to the insulated metals was impossible. One wonders in reading his works whether he really believed that sparks would only occur to metals leading to earth. The elaborate precautions that were taken to connect his conductors with all the metals about the building, whether going to earth or not, do not bear out this contention, or rather would have been the necessity for such connexions? The only construction I can put upon the matter is that he meant that with his system of protection side flash was impossible. I acknowledge that this argument savours of special pleading for Snow Harris, for his writings seem to indicate that his words are to be taken literally. In his work on "Thunderstorms" he discusses the matter at some length and illustrates his arguments by two diagrams. In No. 1 he shows the alternative paths in which case he declares side flash would occur, owing to dividing of the discharge between the different paths afforded. In No. 2 he shows near his conductor insulated metals to which he says side flash will not occur. At least that is I presume what he intends his readers to understand but his words are rather ambiguous. He says, "Can the bodies *a, b, c*, elicit from the conductor at the instant of its transmitting a heavy discharge of lightning, a destructive lateral explosion upon the parts of the building on which they happen to be placed? This is the legitimate and fair definition of lateral discharge as applicable to a lightning rod." I have no hesitation in saying that if that conductor was struck by a heavy discharge of lightning, as he calls it, sparks would pass, though they would be merely sparks between the conductor and those metals, not "explosions" in the bricks to which they are fixed, and there would probably be no traces afterwards of their passage; but if we altered the conditions slightly by placing the conductor about 3 in. from the corner of a building, and the metals 3 in. round the corner, the bricks between would be slightly damaged.

The next event to which I have to draw your attention is the formation of the Lightning Rod Conference. In 1878 the Royal Meteorological Society decided that it was expe-

dient that a conference should be held to consider the best means of protection from lightning, and issued invitations to certain other learned societies to appoint delegates. As a result the following gentlemen were appointed:—Mr. C. Brooke, F.R.S. (who unfortunately died the following year), Mr. E. E. Dymond and Mr. G. J. Symons, F.R.S., representing the Meteorological Society; Professor Lewis and Mr. J. Whichcord representing the Royal Institute of British Architects; Mr. Latimer Clark and Mr. (now Sir) Wm. H. Preece, F.R.S., representing the Society of Telegraph Engineers and Electricians, as the Institute of Electrical Engineers was then called; and Professor W. Grylls Adams, F.R.S., and Professor G. Carey Foster, F.R.S., representing the Physical Society. Professor W. E. Ayrton, F.R.S., and Professor D. E. Hughes, F.R.S., were afterwards added as co-opted members. We have here a brilliant array of names, and it is difficult to believe that a better selection could have been made for the purpose. Their labours extended to December, 1887, when their Report was issued. During that time they had exhaustively examined all the evidence they could collect as regards damage by lightning, the methods adopted by manufacturers, and the writings of British and foreign authors.

The Report of the Lightning Rod Conference, as it is called, was published by Sporns in 1882, and became the standard work of reference on the subject in the English language. Personally, I consider the rules they drew up, although not faultless, are admirable in the way in which I believe they were intended—that is, as a guide to architects and others interested in buildings, which should enable them to learn something of the methods employed in the protection of such structures, and give them some such knowledge as should enable them to see that the work was being carried out on scientific principles; to do away with prejudices often entertained against the use of conductors; but most of all to try and dispel the extraordinary ignorance displayed at that time by some of those engaged in the erection of conductors.

I cannot believe that the Report was ever intended to serve as a complete guide capable of rendering any one who read it an expert fully qualified to plan the lightning conductor system necessary for the protection of a building. If it was, it was a dismal failure, and I do not believe that it is within the power of any man, or of any body of men, no matter what their scientific attainments, to formulate a set of rules which shall serve such a purpose. This Report contains most of the facts which one requires to know, provided one understands the subject sufficiently well to be able to read between the lines and judge the lines of thought which no doubt induced the delegates to frame the rules. For instance, nothing is said about sparking, or side flash, from the conductor in actual words, but they draw attention to the necessity of connecting all masses of metal about the building with the conductor. As in our criticism of Snow Harris, we can say, if sparking, or side flash, was not admitted, where would be the object of advising these connexions? This rule commences:—"As far as practical, it is desirable that the conductor be connected to extensive masses of metal, such as hot-water pipes, &c., both internal and external." I consider the wording of this rule most unfortunate, because practicability has nothing to do with the matter. The connexions are either necessary or they are not. If they are necessary, practicability must not be taken into account; means must be taken to connect them even if it is inconvenient. This rule has led to the assumption that these connexions are not of vital importance, and therefore they are not generally made. With internal metals, for instance, it is rarely considered practical to connect them, because people naturally object to have their walls cut about in order to have a connexion carried through. The explanation of the anomaly is, to my mind, to be found in the words which follow:—"But it should be kept away from all soft metal pipes, and from internal gas pipes of every kind." Obviously, if connecting to internal metals is not practical, the alternative is to keep the conductor sufficiently far away, but the point is generally missed. Probably the vagueness of the first part has led architects and others to think that the whole rule is unimportant, for in the course of a rather wide experience I have never yet met an architect who took into con-

sideration the positions of inside gas or water pipes or other metals when deciding where he would have his conductors fixed.

The conference clearly stated that lightning conductors may be of iron or copper, but advocated the latter metal as being more convenient and durable, and in the end the cheapest. They stated that the minimum size to be used should be a weight of 6 ozs. to the foot run, which in copper tape, the form now mostly used, would be $\frac{1}{4}$ in. wide by $\frac{1}{16}$ in. thick.

The last epoch that we have to consider brings us to more recent times. In 1888, Dr. Oliver Lodge, F.R.S., was invited by the Society of Arts to deliver two lectures on "Lightning Conductors" in memory of the late Dr. Mann, at one time a President of the Royal Meteorological Society, and who, during his lifetime, had taken a keen interest in the subject of protection from lightning. Professor Lodge is one of our most brilliant scientists, but I do not know that he had paid particular attention to this subject previous to this invitation. Professor Lodge delivered these lectures, and I am speaking mildly in saying that they created a sensation. In the course of these he carried out experiments intended to show that a very thin iron conductor was better for the purpose of a lightning conductor than a thick copper one. Incidentally he showed that small-size iron wire was better than stout iron, and that small size copper was better than stout copper. Here we have what appears to be a paradox—the worse the conductor the better it is. It is necessary to say that Professor Lodge states that "the values given are a record of a definite experiment, but their precise value depends on the circumstance of the experiment. It is easy to arrange so that the iron is less effective than the copper." Nevertheless, he remarked that he looked upon copper conductors as doomed. No discussion being allowed at these lectures, criticism of Dr. Lodge's views was impossible, but it was an open secret that he was strongly opposed by other scientists, of whom Sir William Preece was, perhaps, the most antagonistic. At the British Association meeting at Bath in the July following the matter was discussed, and the battle between what were called the schools of theory and experience was fiercely waged. Neither side could claim a definite victory, and so Professor Lodge was asked to read a paper before the Institute of Electrical Engineers, at which the audience being electricians, it was thought that the arguments on both sides would be better understood. So in 1889 a most interesting paper was read, at which most of the leaders of the electrical world were present. In this paper Dr. Lodge discussed at great length the question of side flash, or sparking, from a conductor, but he did not draw a line, as Snow Harris had done, between sparking to insulated metals, and the dividing of a discharge between a conductor and an alternative path. On the contrary, he appeared rather to treat all side flashes as being portions of the discharge, leaving the conductor to go to earth by other and sometimes worse routes, with the exception of secondary effects or the sparkings caused by induction in metals not connected with the conductor. He contended that the older electricians, as he termed what may be called the votaries of experience, had not taken certain laws and effects into consideration. One of the main points in his arguments was that a lightning flash is not a single discharge, but is oscillatory; that is to say, that it consists of a number of discharges backwards and forwards till it comes to rest, a dozen or more alternations probably occurring in a flash occupying a minute fraction of a second, and that under these circumstances the generally accepted ideas as to the comparative conducting value of copper and iron are changed. Therefore, he now contended, iron of the same thickness as copper was "a trifle better, certainly not a whit worse than the latter metal." I may say here that in the discussion which followed, and which was so lengthy that, including the reading of the paper, it extended over three meetings, Dr. Lodge was opposed by the majority of the speakers. They did not, however, protest against the possibility of side flash, but the ground mainly taken up was that lightning was not oscillatory, and they contended that the older views as to conductivity were sound. It is abundantly proved that the spark from a Leyden jar or any perfect conductor is oscillatory, but Dr. Lodge has himself pointed out that a cloud is not a perfect conductor like the coating of a jar or the sheet of metal generally used to represent

a cloud in laboratory experiments; that it has an enormous resistance owing to its being composed of globules of water separated by air, and therefore theoretically I should say that lightning should not be oscillatory because the resistance would damp out the oscillations. The question is, however, I consider an unimportant one, because if harm was not caused by the first or second swing, the remainder would be harmless. Whether oscillatory, or not, lightning has not suddenly changed its character, and without intending to detract in the slightest from the value of either theory or laboratory experiments, I must point out that the greatest value attaches to the observed effects of lightning.

Dr. Lodge illustrated his lectures and paper by some most interesting experiments, which, however, I consider were not conclusive, because the conditions were not such as occur in Nature. It would take too much time to discuss these experiments, but I may point out that the governing principle was to have a conductor of enormous length compared to the length of the spark used to represent the lightning flash. By doing this, the effect, for instance, with side flash is to exaggerate the sparking out of all proportion, and hence those who did not absolutely disagree with Dr. Lodge appeared to me to get an impression that if his experiments were to be relied upon, lightning conductors would be almost useless, for side flash would occur to metals an enormous distance away. For this reason I have not introduced any experiments this evening, because if I magnified the effects in the same way, similar confusion might be caused in your minds, and if carried out in my own way—that is to say, by making everything more nearly proportional, and so approximating as far as possible to what occurs in Nature—the results would be invisible except to a very few. To this day I often hear it said that Dr. Lodge says lightning conductors are useless, and therefore I may quote his disclaimer. In his book on "Lightning Conductors," published by Whittaker's, he says: "I may be permitted here to repudiate the doctrine which has several times been attributed to me since the Bath meeting, that it is safest to be without lightning conductors altogether. The long experience of persons learned in this art is by no means to be despised, and until an agreement as to improvements has been arrived at, the safest plan for ordinary persons is to adhere to existing practice."

Dr. Lodge's work forms, in my opinion, an important addition to the literature of the subject, if taken as purely of theoretical value, and on which we must base our own ideas of the practical results which are to follow. He has called attention to the necessity for taking certain effects more fully into consideration when arranging our system of defence, and has shown us some of the scientific reasons for their appearance, and for this we owe him a debt of gratitude such as we owe to every man who labours to give us a clearer insight into the mysteries of Nature.

The effect so far of his work, however, appears to me to have been to cause a great deal of confusion in the minds of some people, and I must protest against the exaggerated views that are often expressed in relation to these effects. For instance, Dr. Lodge has referred to side flash and to the surging effect of a discharge, and other writers have referred to these effects as if they were some new invention of the devil tacked on to lightning to render it still more deadly than of old. These effects have existed since the days when lightning conductors were first invented, and even before then to the earliest times in which metals used in the construction of buildings have acted as accidental or partial conductors of the electricity from thunderstorms.

Dr. Lodge has made suggestions as to improvements which he considered might be made in the application of lightning conductors. He prefaced these by saying, "It is a matter on which I have not the slightest wish to be dogmatic; and if I make a few apparently definite assertions, it is only by way of expressing such judgment as I have been able to form at present, and they are to be taken as intended, more by way of suggestion and question than anything else." Leaving out of account those rules which apply only to powder magazines and lightning arresters, and three which refer to testing and which are not of practical value, there are only ten which differ materially from previous scientific knowledge of the subject,

I will give these ten rules together with a few remarks, though my later observations will deal more fully with the matter:—

1. The use of copper for lightning conductors is a needless extravagance.
2. Iron has advantages over every other metal.

My later remarks will deal with the question of copper or iron.

3. It is hopeless to pretend to make the lightning conductor so much the easiest path that all others are protected. All possible paths will share the discharge between them, and a lot of apparently impossible ones.

This rule does not differ, except as regards the "apparently impossible ones," from the dividing of a discharge among alternative paths Snow Harris explained about fifty years before. My later remarks may explain this more fully.

4. At all places where water and gas-pipes come near each other, and in general where one metal ramification approaches another, it is best to connect them metallically.

This rule Dr. Lodge has since admitted is very open to criticism, but I consider that it would be an admirable one if it was only qualified by being made to read that in some cases it may be absolutely necessary to make such connexions.

5. It is not wise to erect very tall pointed rods above the roof of a building.

6. In ordinary houses it may be well to try and insulate the lightning conductor from the walls, so as to lessen the chance of side flash to metal stoves and things inside.

7. In chimneys, it may be well to use insulators to protect the bricks from concussion.

These three rules Dr. Lodge has since described as very doubtful.

8. The orthodox rule "connect all pieces of metal to the lightning conductor" requires modification thus, "connect all pieces of metal to each other and to the earth, but not to the lightning conductor."

9. It may be always reckoned safe to earth things independently. It is often not safe to connect them to the lightning conductor; e.g., an inside lining of a chimney would be well earthed, but should not be used as lightning conductor, nor connected with it. The same with rain-water pipes and gutters. The same also probably with lead roofs.

After each of these two rules Dr. Lodge placed a note of interrogation to show, I presume, that he was doubtful about them, and he has since admitted the force of the criticism to which they were subjected, and says he gladly takes refuge in another rule which contains the truism that the most difficult thing is to know what to connect and what to avoid. These two rules would be of vital importance, and would revolutionise present practice if they could be justified, but I hope to show you that they would be dangerous in the extreme, and far from tending to increased efficiency of conductors, would cause failure. They have, however, been quoted by others as if they were correct, and without Dr. Lodge's subsequent remarks, or even the notes of interrogation after them.

10. Over the top of tall chimneys it is well to take a loop or arch of the lightning conductor made of any stout and durable metal. Dr. Lodge has since modified this rule, but I need only say that the coronal band with points at intervals, recommended by the Lightning Rod Conference, answers the purpose perfectly.

Although Dr. Lodge's views did not, I think, obtain the consideration they deserved, we may still consider that there are in existence the two schools, the one of theory pure and simple, as represented by Dr. Lodge, and the school of experience, as represented by the teachings of the older electricians, as Dr. Lodge called them. Between these two we must discriminate and formulate the method of procedure which will ensure success. Theory and experience are each in their way of the greatest value, but one is useless without the other. Experience without theory is not sufficient. A man might have a lifelong experience of the protection of buildings, but if his methods were not guided by theoretical knowledge, that is, if he did not know why he did certain things, success would be at the best uncertain. On the other hand, a man might have a perfect theoretical knowledge and yet be completely lost when he attempted to put his theories to practical application. It must not be supposed that I refer to the members of the Lightning Rod

Conference as men of experience without theory. On the contrary, if they had not adopted or accepted through their chief speaker, Sir William Preece, the title of the school of experience, I should have styled them a school of theory also, for the Conference consisted of men of science pure and simple, who had probably had very little practical experience of the protection of buildings. Their claim to have founded the rules on experience is probably based mainly on the fact that the evidence they collected and considered was largely of a practical kind. For the sake of distinction, however, we will keep to the terms theory and experience in considering the points in dispute. Experience says, let your conductors be of copper, which is of better conducting capacity than iron or any other metal which it would be practical to use for the purpose; and besides, it is the most durable, and in the end the cheapest. The comparative conductivity of copper and iron, they base on tests made by many distinguished scientists, both British and foreign, who have shown that in the case of steady currents of electricity copper conducts about seven times as well as iron. Theory says, that for sudden discharges such as lightning the conditions are changed and that iron is "a trifle better, certainly not a whit worse than copper," and that the use of the latter metal is a needless extravagance. Also that instead of having single conductors of copper, a number of lines of conduction of iron wire of small size is better (ordinary telegraph wire is suggested); that these wires should be carried down each corner of every chimney stack and on all sides of the building. For a chimney shaft this system is to consist of galvanised iron wires fixed vertically on all sides with other wires carried round the shaft at intervals to connect them all together. On purely theoretical grounds, I see little to choose between the two systems provided the conductors are applied on scientific principles. A man who understood the subject thoroughly would be able to protect a building as perfectly with one system as with the other, but the many iron wires would be more difficult to apply successfully, because it is easier to place one or two conductors so as not to be within sparking distance of metals to which it is not advisable to connect them than to fix a dozen so. We have had a very extended knowledge of the experience type of conductor, and we have had plenty of cases in which they have succeeded. We have also had cases in which they have failed. I have myself inspected a great number, that is to say, nearly every case I have heard of. The number has been on an average about a dozen a year, but in every case that I have examined, with one exception, there have been glaring defects such as rendered the failure certain, and which could have been pointed out beforehand by a competent person who had examined the building before the accident happened. The one exception was Neadwood Church, Staffordshire, where sparking occurred owing to a line of metal having been laid from close to the conductor to near a large metal stove used for heating the building. The line of metal was the lead binding of some matting—insignificant enough in itself, but from an electrical point of view it brought the stove into dangerous proximity with the conductor. Of the theory type of conductor we have had very little opportunity of judging. In one case, in which it has had to bear the test of being struck by lightning, it failed. This was the Hotel de Ville at Brussels, and this was set on fire, curiously enough, about the time that the great Preece v. Lodge controversy was proceeding. I have only had an opportunity of examining one system of this sort erected in this country. So far as I know, it has never been subjected to the test of lightning, but it is nevertheless, an instructive case. In 1861-65 a chimney-shaft was being built for the Islington Electric Light Station, and the chief engineer, Mr. Albert Gay, having followed Dr. Lodge's arguments very closely, decided to try the small iron wire system of conductors. By 1867, however, it was found that this system had perished to such an extent, that, in order to avoid the expense of frequent renewals, it was decided to provide also for the same shaft an ordinary conductor of copper tape, $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. The cost of the copper conductor was 22*l.* I have not ascertained the amount paid for the iron wire system; but, allowing for the same rate of profit that appears to have been made on the copper one, I estimate that the cost must have been between 35*l.* and 38*l.* A few

days since I had an opportunity of examining the two systems, and found that, while the iron one had largely perished at the top where it was exposed to the fumes of the chimney, the copper one was practically as good as when it was fixed. This would, I think, be a fair sample of the theory type of conductor—durability sacrificed and original cost increased tremendously. For it is a very great mistake for Dr. Lodge to suppose that his suggested iron telegraph wire system would be cheaper than the copper tape generally used. Iron is, of course, cheaper than copper, but the cost of fixing is a serious item, and where say several hundred feet of iron wire has to be fixed in place of a hundred feet of copper tape, the total cost must be greatly increased if the work is to be done by competent men under the guidance of an expert. If Dr. Lodge had any idea that a local blacksmith or labourer could be entrusted with the work and the expert and his trained workmen done away with, the result would, I believe, still be increased cost, and instead of hearing of occasional cases where conductors had failed, we should be astounded to hear occasionally that a conductor had actually been successful.

Personally I do not attach very great importance to the kind of metal to be used for a lightning conductor. The conductor may be of copper or iron, or it might even be of lead, so long as it is of sufficient capacity not to be melted by the heating effect of a severe discharge, it will answer if properly applied. It must not be supposed from this that I advocate the use of lead, or even iron. Iron conductors have been used almost exclusively in America since Franklin's day and also in some Continental countries with as good results as in England where copper is almost exclusively used. It is very probable that the older ideas as to the relative conductivities of copper and iron do not apply in the case of sudden discharges, although I do not think that Dr. Lodge has proved his case; but if iron, instead of being "not a whit worse than copper," was seven times as good, it would not prevent the dividing of the discharge between it and other paths afforded, or even sparking to insulated metals, if it was not scientifically applied; and on the score of durability and cheapness, I have no hesitation in saying that the older type, or copper tape conductor, cannot be beaten. On the score of appearance, too, copper tape has the advantage, and appearance has to be considered, for I do not think there are many architects who would consent to have their work turned into what would look like enormous birdcages.

As Dr. Lodge has himself said, it is impossible to make the lightning conductor such a superlatively easy path that the discharge will take that one only if other paths are open for it, but it is here that the skill and scientific knowledge of the expert has to be shown. If one had to protect a structure composed only of brick, stone, or wood, and with not a particle of metal in its construction, nothing would be easier. All that would be necessary would be to have a conductor of metal, pointed at the top and leading down into the earth. It might be made in lengths scarcely touching one another, and the earth connexion might be absolutely bad, and yet the building would be protected. All that would happen would be heating and possible fusion at the joints, and the ground at the foot of the conductor might be blown up. It is very rarely, however, that one is called upon to protect a structure of that kind. Modern buildings are often a mass of what I may call unintentional lightning conductors, for all the metals used in the construction of buildings are conductors of electricity, and therefore conductors of lightning. Some of these metals have good earth connexions—in fact, gas and water supply-pipes have excellent "earths," owing to the extent of their ramifications underground; and it is a matter of considerable difficulty—in fact, in some cases practically impossible—to make the "earth" of the intended conductor as good as these accidental ones unless we actually connect the conductor to the underground mains. This is the common-sense view of the matter. It is no use for a manufacturer to tell you that with his patent coupling, or serrated earth plate, or what not, he can guarantee that sparks will not pass off to accidental conductors placed dangerously near it. If he says that, he either does not know what he is talking about or he is guilty of a deliberate false-

hood in order to sell his wares. There is nothing magical about a lightning conductor; it is merely the adaptation of the known laws of nature to the use of mankind. If you fixed one conductor to the highest part of a building, and another one, say, 6 ft. up the wall, and approaching within a foot or two of it at that point, and both with equally good earth connexions, I do not suppose you would be surprised if the lightning divided and part went down one conductor and part down the other, or, if brickwork intervening, a hole was made through it. Why, therefore, should you be surprised if, when arranging for your lightning conductor, you take no heed of the metal inside the building, and place one conductor down outside and another one in the form of a gas-pipe inside, and the discharge divides between the two, knocks a hole in the wall, and sets light to the gas? Lightning has to follow certain unalterable laws, and one of those laws is that if two or more paths are provided, it must divide between them. It is no use labelling or calling one the lightning route; that will not alter the law. Out of the many cases of true failure of lightning conductors that I have examined I have found that 90 per cent. have been due to neglect of this common-sense view, as I call it.

It is no argument against the use of conductors that the discharge will divide between accidental and intended paths. It merely shows the necessity for arranging the conductor so that the faults which lead to the division of the discharge shall not exist. If such faults do exist, it is obvious that the damage should be very much less, and never in any case greater, than if the conductor had not been applied at all. But this is poor philosophy. We should arrange so that the division shall not take place. We cannot prevent a building being attacked by lightning—any structure, from a cathedral to a hencoop, may be struck. All we can do in this respect is to provide our conductor with points (and the more the better) to lessen the liability of its being struck. We can, however, go further than this. We can, by carefully studying our building both inside and out, arrange our conductor system so that the lightning shall go harmlessly past it through our conductor and leave our building and its contents secure. That is unless somebody who does not understand the matter comes along and alters the conditions that we studied, and so makes our system less effective. Before going further into the matter I must draw a distinction, as Snow Harris did, between side flash to other paths and sparking to metals which do not afford an alternative path, though not agreeing with him as to the impossibility of the latter. In order to make the matter more clear I must dip a little into theory, though I do not think it necessary to go very far.

There is nothing mysterious in lightning sparking through to a gas or water pipe or other metals the other side of a wall. It is not chance, or instinct, or any other quality not explainable by scientific laws. We must reason the matter out by the use of the faculty of imagination, for I know of no simile which would serve to bring the matter to your minds. As Professor Tyndall once said of another scientific matter:—"The question leads us beyond the region of sense and into that of imagination. This faculty, indeed, is the divining rod of the man of science. Not, however, an imagination which catches its creations from the air, but one informed and inspired by facts, capable of seizing firmly on a physical image as a principle, of discerning its consequences, and of devising means whereby these forecasts of thought may be brought to an experimental test. If such a principle be adequate to account for all the phenomena, if from an assumed cause the observed facts necessarily follow, we call the assumption a theory, and, once possessing it, we can not only revive at pleasure facts already known, but we can predict others which we have never seen. Thus, then, in the prosecution of physical science, our powers of observation, memory, imagination, and inference are all drawn upon. We observe facts and store them up; imagination broods upon these memories, and by the aid of reason tries to discern their interdependence. The theoretic principle flashes or slowly dawns upon the mind, and then the deductive faculty interposes to carry out the principle to its logical consequences. A perfect theory gives dominion over natural facts; and an assumption which can only partially stand the test of a

comparison with facts, may be of eminent use in enabling us to connect and classify groups of phenomena." So in the present case we must exercise the faculty of imagination in order to understand what takes place, and if we are omitting certain conditions or considerations which afford a fuller explanation, still, if it enables us to grasp a general idea, and assists us to understand the matter, we shall be in a better position.

When the conditions are proceeding which lead to a discharge of lightning occurring, induction, as I have already pointed out, takes place, that is to say, there is an enormous difference of potential between the cloud and the building about to be struck; this inductive action is stronger in conducting than in non-conducting masses, therefore the lightning conductor and other metals would show this action better than brickwork. If the metal is connected to earth the action would be quick, if the metal is insulated the action would be slower, because the charge would have to filter through the insulating material gradually. Suppose that we have a lightning conductor, and near it, say, a metal safe. Let us suppose for the sake of argument, that the value of this induced charge was I (if the cloud was positive the induced state would more properly be described as a minus quantity, but it will be more simple if we regard it merely as I) both in the lightning conductor and the safe. Then comes the discharge, the conductor has its potential raised suddenly at the moment of receiving the flash to, say, $1,000$, but the safe, which is insulated remains practically at I . There is then a big difference of potential between the conductor and the safe, one being $1,000$ and the other I , therefore there is a strain, and if the safe is near enough a spark passes knocking a hole through the wall so as to bring the potentials nearer in value. Let us say that the safe is raised to 800 . In the meantime the discharge has died out in the conductor, and this returns to I ; but the safe is 800 , so that there is still a difference of potential but the values reversed, and a spark passes back. So backward and forward should the spark pass—possibly half-a-dozen or a dozen times in a minute fraction of a second, a fraction so minute that we could not detect the alternations, and we should perceive only one spark, until the two objects arrive at about the same potential, when the tension dies out. This would be an oscillatory spark. If we connected the safe and the conductor together by a piece of metal, these oscillations would take place through the metallic connection, and there would be no visible effect, unless, say, we had another safe a few inches away from the first one, when there would be again a difference of potential and resultant sparking. Again a third safe near the second and the same thing would occur—in fact, this might be carried on from one to another to a considerable distance, providing each succeeding interval between the safes was less than that preceding it, and sparks would pass between each, but at each interval the spark would be weaker, till we should get to a distance at which no spark would pass.

Let us suppose another case—a long piece of metal, say, 20 ft. in length, connected at one end to the lightning conductor but not otherwise connected to earth. At the moment of the occurrence of the flash the potential of the conductor would be raised, and also that of the long piece of metal; but the rise in the latter would occur at the end connected before it did at the other, therefore we should get an alternative rise and fall of potential at the ends of this piece of metal, or what Dr. Lodge calls a surging effect, but this would be harmless unless another piece of metal at a different potential came near it. If it did there would be sparking. Even if the long piece of metal was not actually connected with the lightning conductor, but just so far away that a spark would not pass to it, there would still be the same surging effect caused by induction, and if other metal approached close to the other end there would be difference of potential and consequent sparking. These are instances of local sparking only, and do not indicate that any part of what we may call the lightning has left the conductor to go to earth by another route. This sparking is not as a rule a very serious matter. A small hole may be made through brickwork or other intervening non-conducting matter, but that is about all, unless some inflammable material intervened, when a fire might be caused.

Now we come to the question of division of

a discharge between a lightning conductor and other paths to earth, which form what I call accidental conductors. Given a lightning-conductor outside and a gas or water-supply pipe near to it inside the building, and this is a very different matter. The action as regards difference of potential and consequent strain and resulting spark is somewhat similar; but the sparking distance is very much longer, and the spark more powerful, because it is actually a portion of the lightning discharge passing. If we knew the respective inductive resistances of the intended and accidental conductors, we could gauge approximately what proportion of the discharge would go to earth by the former and how much by the latter. But even if you got nineteen-twentieths of the discharge through the former and one-twentieth through the latter, it might be a serious matter. I may here refer again to Dr. Lodge's suggestion that metals should be connected to earth and not to the conductor. Let us take again the question of the safe near the conductor. If it was neither connected with the earth nor the conductor we should only get local sparking, as I call it, but suppose we connected the safe to earth and not to the conductor, we should get an alternative path to earth provided by which actual division of the discharge would occur, and this would be a far more serious matter. Besides this, the sparking distance would be increased enormously, so that objects which would otherwise have been at a perfectly safe distance would be in dangerous proximity. On the other hand, the indiscriminate connexion of metals would be almost as fatal.

Now as to the methods for rendering our system of protection perfect. We must first of all decide on which are the parts of the building liable to be struck by lightning, and protect them either by separate conductors or by branch conductors carried to one or more mains to earth as may be necessary, and we must see that these conductors afford as little resistance as possible. The joints must be soldered so that they will not only be perfect at the time they are put up, but will remain perfect. The earth connexion must also be made so that this path is at least as good as one as other paths about the building; and besides this we must carefully study our building, both inside and out. We must take into consideration all the metals used in its construction, both as regards their relation to the conductor system and to one another, and take such precautions that neither division of the discharge shall occur unless we intend it to occur, nor sparking in places where sparking would do harm. It is here that the skill and experience of the expert have to be displayed, and I cannot give you any rules for your guidance on this matter, for buildings differ so much in their construction and arrangement that rules applicable to one case would be absolutely useless for another. Nothing is of use but knowledge and experience, and as I have already indicated, these cannot be imparted or acquired in a short space of time. I can only say that in some cases connexions are made and in others the dangerous metals are avoided, but that great discrimination is required as to what metals are connected and what avoided. Sometimes dividing the discharge between several paths or over a wide extent is the best plan, and sometimes other plans are adopted according to the exigencies of the case or the particular combination of dangers which one may find to exist.

So far I have only touched on what I may call the fringe of this subject. Time will not allow of going much further, though there are many questions, such as the making of earth connexions, which are often misunderstood, and in which the methods of procedure sometimes adopted differ widely from the scientific and common-sense methods. I may, however, in conclusion, discuss a matter which is of great importance to architects, and that is as to what parts of a building are liable to be struck, and which therefore require protection. When we have an important public building to protect, and cost is of no importance, we may be tempted to run conductors in all directions and protect all parts whether likely to be struck or not. It is not often that over-protection will do any harm, though it may do so if the matter is not properly done. In the majority of cases cost is, very properly, a serious consideration, and we do not want to add a penny more to the outlay than is necessary to secure efficiency. It is therefore important to know just what are the places

liable to be struck. I have devoted many years to this question, and have examined many thousands of buildings which have been struck, first with the object of formulating a theory, and afterwards to prove that theory, and I propose putting this before you as briefly as possible. The main principles are simple, and possibly it is the very simplicity of the matter which has led to its being overlooked. The popular idea is that it is the highest point of a building which is struck, but probably some of you may have met with cases in which others very much lower have been damaged. I have come across hundreds such. The explanation is that the nearest part of the building to what I may call the point in the cloud from which the discharge originates gets struck, and the highest is not necessarily the nearest. A discharge occurs between two planes or points one of which is in the clouds and the other is in the ground; the building is merely an object en route, as one might say, which forms a path of less resistance than the surrounding air. Now, a lightning conductor does not attract lightning except inasmuch as, being of metal, induction and consequent difference of potential takes place more strongly in it than in the surrounding non-conducting materials, and in this respect the thin line which is intended to protect the building from lightning is insignificant compared to the other metals used in its construction. Brickwork, although non-conducting to a certain extent, offers a lower resistance than air. Therefore it would be contrary to science for a discharge to pass over a chimneystack or gable-end to strike a lightning-conductor merely because it is metal when probably the gable-end or chimney has a much larger extent of metal just below it. Even if the lightning-conductor affords the best path to earth, the path of least resistance would be through the gable-end or chimney and the house to the conductor, rather than through a corresponding distance of air, to get to the top of the conductor. We have to consider two kinds of discharge, one the most dangerous type, which occurs fairly straight through the air in an almost vertical line, and the less dangerous flashes which occur in a somewhat oblique line, and are generally meandering in their course. These latter flashes are often called forked lightning, though this is a misnomer, and are popularly, but mistakenly, supposed to be the most dangerous. It is the straighter flashes which do the most harm; those which are capable of breaking almost straight through the air without having to go out of their course to take advantage of any little conducting matter, such as moisture, which will assist them on the way. The meandering flashes are not by any means to be ignored, it is only in comparison with the straighter ones that they are mild.

In arranging what parts of a building require protection, we have to consider the various points in the sky from which the discharge may originate, and so arrange our system that the conductor, or one of its branches, will form the nearest part, no matter from what direction the discharge may come. There is, of course, a limit to the angle of obliquity, and this limit should be about 40 deg, and my observations have led me to infer that the greater the angle of obliquity the milder the discharge. We hear reports sometimes of buildings having been struck by lightning in absolutely unaccountable places, such as lightning missing a tall spire and striking the nave close underneath it, or even striking through a window. Like all other so-called vagaries, freaks, or perversity of lightning, such peculiarities do not exist except in the minds of people who do not understand the matter. For a dozen years past I have been scouring the country to try and discover a freak of lightning; plenty are reported in the papers, but on investigation they all prove to be ordinary enough, and merely what one could have predicted had one been informed of the circumstances beforehand. Lightning is a force of Nature, and, like all other natural forces, is governed and regulated by laws more unchangeable than those of the Medes and Persians; therefore if we find cases which do not quite agree with our preconceived ideas, we must admit that we either do not know the law, or that we have overlooked some important factor of the case, and not put it down to a sudden and capricious change in the laws of Nature.

I have prepared a rough sketch showing a house with a turret and gable ends, a tree, a wall and a hen coop, placed in a line and so

arranged that either may be struck according to which is the nearest object to the point overhead from which the discharge occurs. These are all objects which I have known to be struck by lightning, and I have heard great surprise expressed sometimes that the lower object should have suffered and the higher one, not so very far off, have escaped. In arranging as to which parts to protect, therefore, we can consider this question as to which would be the nearest parts, and we can take it that these are parts which might be struck, other parts between them in height may be absolutely safe if they come well within a line drawn from one to the other, provided other circumstances are equal; but they may not be, for metals either inside or outside the building and other circumstances may complicate the question so far that this rule does not entirely apply. Here, again, the expert requires to weigh carefully the whole circumstances, and nothing but knowledge and experience will enable him to decide accurately which places may safely be ignored and which may not. Notwithstanding all the difficulties that I have pointed out, absolute protection is possible if the building is thoroughly studied. We can either protect it so that we can say not a brick or stone shall be disturbed, or we may say we will protect it so that the inmates shall be safe and the building shall not be set on fire or damaged to any extent—we may say that a stone finial at this end may be knocked down, or a few bricks or tiles disturbed there, and that we will risk that as we do not consider this damage worth providing against, but if we do this we must realise that we are running the risk, and if the stone finial is thrown down, or the bricks or tiles displaced, we must consider that we deliberately took the risk, and that it is not a failure of our system of protection. In conclusion, I can only advise you not to make the general error of providing your conductors of exceptionally large size under the mistaken idea that by providing your conducting path of exceptional capacity as it is wrongly called, you can ignore the scientific aspect of the question, for no increase in size of the conductor will compensate for this, and unless you are prepared to devote a number of years and a large sum of money to a very close study of the subject you must be prepared to abide by the opinion of an expert who has acquired the necessary knowledge, and be guided by him, confining yourselves to a close supervision of the work, and to seeing that it is being carried out in a way which will not only render the work efficient when it is completed, but will remain efficient until accident, decay, or the interference of people not acquainted with the subject has impaired its efficiency.

The following communication was also received from Mr. Killingsworth Hedges, M.Inst.C.E.:—I have read Mr. Hands' paper with great interest, and think he has brought to the notice of the members of the Architectural Association a problem which, as he rightly says, "is all the more difficult the longer you study it." I quite agree with his remark as to the immense amount of damage to property which annually occurs through lightning strokes, much of which might be prevented if efficient lightning conductors were installed. Most people think that almost every church has its conductor, when not 70 per cent. are so provided, and in the case of public buildings the proportion is much less. There is a sort of go-as-you-please policy which seems to be the rule with regard to lightning protection. Insurance offices do not seem to care whether a building is protected or not; no individual office likes to insist on the erection of lightning conductors for fear of diverting business to its rivals. In the case of a church there is certainly sometimes a recommendation from the archdeacon that the churchwardens should put up a conductor and see that it is kept in order; but if the vicar wishes to safeguard his church the cost usually has to come out of his own pocket. Architects, too, as a rule, put the erection of lightning conductors in a few lines at the end of their specification, and say nothing as to the way they are to be run or as to the necessity of good earth and of constant inspection, and then we wonder why a building provided with a so-called conductor is struck! The author has mentioned the advantages of having many points, but then goes on to say "that they may not be able to prevent discharge." This inability is, in my opinion,

only a question of their number, as usually installed, without regard to interconnection. Some may be inefficient, but on a properly protected building the number of points should be so distributed that the whole building is bristling with the so-called negative discharge, and therefore an actual disruptive effect is warded off. I have endeavoured to carry this out in the protection of St. Paul's Cathedral, where there are over a hundred points all connected with one another and at intervals to earth. So convinced am I that this is the correct system that in the work now being installed under my supervision at Westminster Abbey the actual number of points in proportion to the area will be still greater. I have already alluded to the researches of Dr. Oliver Lodge in my paper entitled "The Protection of Public Buildings from Lightning," read before the Royal Institute of British Architects on April 23 last year,* and I beg to refer those interested to my concluding remarks under the head of "Practical Questions," in which I have slightly altered Dr. Lodge's rules and added some of my own.

The Chairman said they had listened to a very interesting paper of a practical and scientific character. It was impossible for architects to understand as an expert would the theory of such a subject, but it was necessary, for the proper carrying out of their works, to have a general knowledge of it. The lecturer, by his remarks, diagrams, and lantern views, had indicated certain principles which had been found essential to the protection of buildings from lightning. The point which interested them most of all was that of how to deal with conductors so that they should not disfigure buildings. In Germany and France conductors were of enormous size and height, and there were very many of them—out of all proportion to the number to be seen in this country. It was very difficult to design a refined fleche or any high sky line which would not be injured by a lightning conductor.

Major-General E. R. Festing, C.B., said what was wanted was a more proper record of facts with regard to lightning. He was present that evening as a member of a committee lately formed to collect facts in regard to the matter, and he believed that some good might be done in that way. The accounts generally to be got of damage done by lightning were often of a very unscientific and sensational character, and the Committee hoped to enlist the services of men who were qualified by position or training to record properly these facts, and who would be interested in doing so. In that way he believed the science of the matter might be much more advanced than by trying to theorise too much on the imperfect knowledge and facts we possess at present. If they could get the facts in cases where lightning conductors had failed, and tried to find the reasons for these failures—it was only by examining the matter in that way that they could make progress.

Mr. W. P. Goulding, F.R.G.S., F.S.I., said they were much indebted to the lecturer for the able way in which he had brought the subject before them. He had gone through that weary book, the Report of the Lightning Rod Committee; and those who did so must be surprised at the great diversity of opinion on the part of the scientific men who constituted the Committee. The subject was one about which very little was known. A lightning flash was such an erratic, elastic, and elusive thing that it could not be pinned down. No two flashes were of the same duration, potency, or velocity; but, for all that, we tried to cope with it. In France they erected strong, high conductors, and the effect on buildings caused by them must be considerable when the wind was blowing heavily. He believed that 75 per cent. of our churches had no conductors, and while this was so, and people would not take the trouble to protect their buildings, the data needed on the best method of doing so could not be obtained. Generally speaking, the architect or surveyor could not get the building-owner to go to the expense of a conductor, while the insurance companies paid for losses caused by lightning. The speaker then gave a brief sketch of what he considered a safe and sufficiently protective conductor for all ordinary buildings.

Mr. John Slater, in proposing a vote of thanks to Mr. Hands for his interesting paper, said he was almost disposed to think that Mr. Hands had so often been engaged in examin-

ing the destruction caused by lightning that his paper had been fuller of destructive than of constructive criticism, and he (the speaker) wished that had not been so much the case. The historical account Mr. Hands had given of the matter and the various theories accounting for destruction had been very interesting, but what was wanted was the knowledge how best to protect buildings from lightning. The statement made as to the amount of damage in £ s. d. caused in England during the few years that Mr. Hands had been investigating the subject showed what an enormous amount of loss there was from the effects of lightning; and if means could be found and adopted for diminishing it to any extent it would be a great advantage to the architect and the general public. The most interesting matter to investigate was, as Major-General Festing had said, the case of buildings which had lightning conductors and yet got damaged; and what was wanted to be ascertained and thoroughly known was to what extent lightning conductors would protect buildings, and when they did not what were the reasons.

In one remark made perhaps the lecturer was not quite exact. When Mr. Hands said that a lightning conductor was not struck, he (the speaker) supposed he meant it was not struck by a discharge which looked like a stroke; but, as a matter of fact, the conductor was continually attracting the electric current from the clouds to the ground, and if it did not it was not acting as a conductor. In regard to the statement made some years ago by Dr. Lodge that copper conductors were doomed, he thought that Dr. Lodge would say that he had seen reason for changing his views, for there was not the slightest doubt that copper lasted longer than iron and was, therefore, more economical. Mr. Hands said that the question whether a discharge from a lightning rod was oscillatory or not was not of great importance, because the lightning did not instantly change its character. That might be very true in one sense, but, undoubtedly, the character of the discharge and the effects of the stroke did vary very considerably. He would have been glad if Mr. Hands had given them some more practical hints at the conclusion of his paper. One of Mr. Hands' diagrams appeared to prove a little too much, for to tell which part of a building would be struck one needed to be an expert in clouds. It was all very well to say that if the point of discharge was immediately over a particular building that that building would be struck, but that was begging the question altogether. Architects and others wanted to protect buildings, no matter where the discharge might be. Mr. Hands apparently argued that buildings could be over-protected. He (the speaker) did not see how that could be, and it seemed to him that to be safe every part of a building should be protected, and not only that part immediately under a possible point of discharge. One extremely difficult matter to be dealt with was as to finding out the position of all the metal in a building. One might be consulted about a building where no lightning conductor had been fixed; they could find out where metal was both inside and outside; but how could they get to know where cramps, &c., existed inside the walls, near which the conductor might be placed? In the case of a tower or steeple, damage was frequently caused by the metal inside the stonework being near the path of the lightning as it came down the conductor. As to the Chairman's remarks about the difficulty of getting an artistic form of conductor for an elegant fleche, it seemed to him that architects might copy the means which large chimney constructors frequently adopted. They had a cast-iron cap above the chimney-shaft into which the points forming the lightning conductor were soldered. He thought that the top of a fleche might be covered entirely with metal, where the points to break a discharge might be fixed in considerable numbers. They would not be at all unsightly, because they would scarcely be seen from the ground. The committee to which Major-General Festing had alluded had been formed on the initiative of Mr. Killingsworth Hedges, and with the concurrence of the Institute of Architects and the Surveyors' Institution, with the object of endeavouring to collect material to form, if possible, a sound theory as to lightning strokes. The aims of the committee could be obtained from the Institute and a copy of questions which the committee desired to get answered, showing the data which were wanted. Any useful suggestions would be received with pleasure.

* See our issue for April 25, 1900.

because the more facts they could ascertain as to the action of this extraordinary and erratic fluid, the better would the committee be able to put forward their theories. The difference between theory and experience must not be carried too far. It was no good having a theory and then finding that the facts would not suit it; they must collect the facts and then base a theory on the facts; and the more information and the more exact that information, the more likely that the labours of the committee would be successful.

Mr. G. H. Fellowes Prynn seconded the vote of thanks. When experts differed, as Mr. Hands had shown they did, it was hard for architects to agree as to what was the best means to adopt for the protection of buildings from lightning, and it would be of great value if the newly-formed committee obtained the necessary data on which to base their theories. It would be interesting to know what Mr. Hands considered were the best metals to be connected up with the lightning conductor, and also whether he knew of any cases of lead gutters or roofs specially attracting lightning—whether the lightning was attracted by the masses of lead. Did Mr. Hands consider it advisable to connect the lightning conductor in any way with the lead pipes? The lecturer's remark, that it was unwise to connect with soft metal, seemed contrary to experience. Rain-water pipes, by being connected up to lightning conductors, could be made most valuable channels for lightning discharges, as he knew from experience. In a church he built some five years ago in Cornwall the copper-covered spire, protected at the top, was struck by lightning immediately underneath the tower, on the ridge of the nave roof, close to where the secret gutters were. The discharge was carried down the rain-water pipe, and although it did some damage to the roof it did not set it on fire. Was a pipe or water near a building any protection to that building? Did Mr. Hands know the distance a lightning spark would go from one metal to another?

The vote of thanks having been agreed to, Mr. Hands, in reply, said that as to the French lightning conductors, the French idea had always been that there was a cone of protection afforded by conductors, the base of which was nearly twice its height, and on that ground they generally had their rods about 10 ft. high, placed all over a building. The appearance was most unsatisfactory, and the conductors did not afford any better protection than was afforded by the English method of having points where necessary. He agreed with the Chairman that an ordinary lightning-conductor rod was a most unsightly thing when put on a flèche, but then it was absolutely unnecessary; the idea was far too prevalent that a lightning conductor must terminate in an elevation rod. A vane was a perfect conductor, and it was not necessary to have an elevation rod on that; it was quite sufficient if the conductor was properly connected to it. The theory of a cone of protection had been sometimes misrepresented. Dr. Lodge had said that the cone of protection was quite useless because you can draw sparks from the lightning conductor. That had nothing to do with the matter; the theory was that lightning would not strike any point within a certain cone. In regard to the diagram Mr. Hands had referred to, what he (the speaker) wished to show was that there were certain parts of a building which were liable to be struck by lightning, and one could tell on examination what those points were. He had tried to reduce the matter to a science, and one did not require to be "an expert in clouds" to understand the matter; one could look at a building and study the question of that part a discharge was liable to come on and what part of the building it would strike if it did come. As to Mr. Slater's remark that more of a practical character might have been said in the paper, that was a difficulty. He thought it desirable to say something of the history of the matter, because the history contained the information required and he also wanted to place before them the facts as between iron and copper conductors and the arguments of Dr. Lodge. In doing this he had been compelled to reduce the length of his paper. Mr. Slater asked how over-protection could be done. Well, it could do harm under certain circumstances. In the case, say, of a church spire: in the ordinary way it would be protected by a single conductor, which

if properly applied would render it absolutely safe, but conductors might be taken down the four sides for the sake of extra security, and then there would be a good chance of one of the conductors being within sparking distance of metal in the building, whereas with one conductor the building could be kept safe. As to what metals should be connected, that was a matter that could not be decided by rules; each building must be studied individually as regards the metals in their relation to the conductor and to one another. Lead did not attract lightning; in fact, metals did not "attract" lightning at all. All metals on the outside of a building should be kept in contact with the conductor, and it was perfectly safe to connect lead gutters, &c., or iron rain-water pipes. At the same time, the inside of the building must be studied in order to see what metals there were and what ought to be brought into the conductor system, or avoided. He did not think any rules could be given as to a safety distance of metals in the case of sparking. It depended on the extent of the metals and where they led to. All he could say was that local sparking from a conductor to insulated metal such as an iron cramp would be a matter of inches only, and the damage might be so slight that it might not be noticed at the time, but division of a discharge between a well-earthed conductor and a gas or water supply-pipe would occur to rather over 4 ft., and considerably further if the conductor was not well earthed.

Officers for next Session and Votes of Thanks.

The Chairman then read the result of the election of officers and committee for session 1901-1902, as follows:—

President, Mr. W. Howard Seth-Smith.
Vice-Presidents, Messrs. G. B. Carvill, and E. Guy Dawber.

Committee, Messrs. A. T. Bolton, F. D. Clapham, W. A. Forsyth, H. T. Hare, Hon. A. McGarel Hogg, Arnold Mitchell, W. A. Pite, G. H. Fellowes Prynn, W. H. Raibles, and E. Howley Sim.

Hon. Treasurer, Mr. Francis Hooper.
Hon. Librarian, Mr. F. J. Osborne Smith.
Hon. Secretaries, Messrs. R. S. Balfour and H. P. G. Maul.

The above form the Committee. The other officers are:—Hon. Solicitor, Mr. W. H. Jamieson; Hon. Assistant Librarians, Messrs. C. H. F. Comyn and W. A. Jeckells; Hon. Auditors, Messrs. E. Greenop and Guy M. Nicholson; and Secretary and Registrar, Mr. D. G. Driver.

Mr. G. H. Fellowes Prynn said he desired to propose a very hearty vote of thanks to the President for his services during the past session. He was quite sure that there was no member of the Association who did not feel that during his term of office the President had carried out his duties most thoroughly, and with a genuine love for what he had done. Their President's year of office—to be extended for another year—would always be remembered as an epoch-making year, for during that time they had initiated the scheme of day classes foreshadowed in the President's opening address. They all hoped that those classes would meet with the success they deserved, and it was no small honour for a man to have his name associated with such an epoch-making year in the history of the Association.

The vote having been very heartily agreed to,

The Chairman in reply said it had been and was the greatest pleasure to him to do all he could to forward the work of the Association. In that work he had been most ably seconded by every member of the Committee, by the officers, by the cordial support of the general body of members, and last but not least by the ability and energy of their esteemed secretary, Mr. Driver. He sincerely hoped the day classes would prove successful.

The Chairman then proposed votes of thanks to the hon. secretaries (Messrs. G. B. Carvill and R. Sheleton Balfour), the vice-presidents (Messrs. W. A. Pite and R. Elsey Smith), hon. Librarian (Mr. Arthur S. Flower), the editor of the Architectural Association Notes (Mr. G. H. Fellowes Prynn), the sub-editor (Mr. H. A. Satchell), the School of Design visitors, the Education Committee, the Education Board, the Royal Institute of British Architects (for the use of the Meeting-room), and to Mr. E. W. M. Wonnacott for working the lantern during the session. The hon. secretaries and the vice-presidents had toiled assiduously to further every project brought forward for the good of

the Association, and they had done admirable work. The hon. Librarian, as they all knew, had done more than ordinary work in getting the library into order in consequence of the rearrangement of the premises, and the Association was very much indebted to him and to his assistants for the excellent work they had done. Mr. Prynn's services as editor of the Notes were worthy of special mention, for he had carried out his duties with a thoroughness which distinguished all he did. Mr. Prynn had been most ably assisted by Mr. Satchell, who had done much hard work in sub-editing their journal. The School of Design visitors gave much prestige to the educational work of the Association, and thanks were due to them and other educational bodies for what they had done.

A vote of thanks was also passed to the scrutineers of the votes given in the election of officers, *i.e.*, Messrs. H. G. Collins, C. W. Beaumont, A. A. Carver, and W. A. Jeckells. The meeting then terminated.

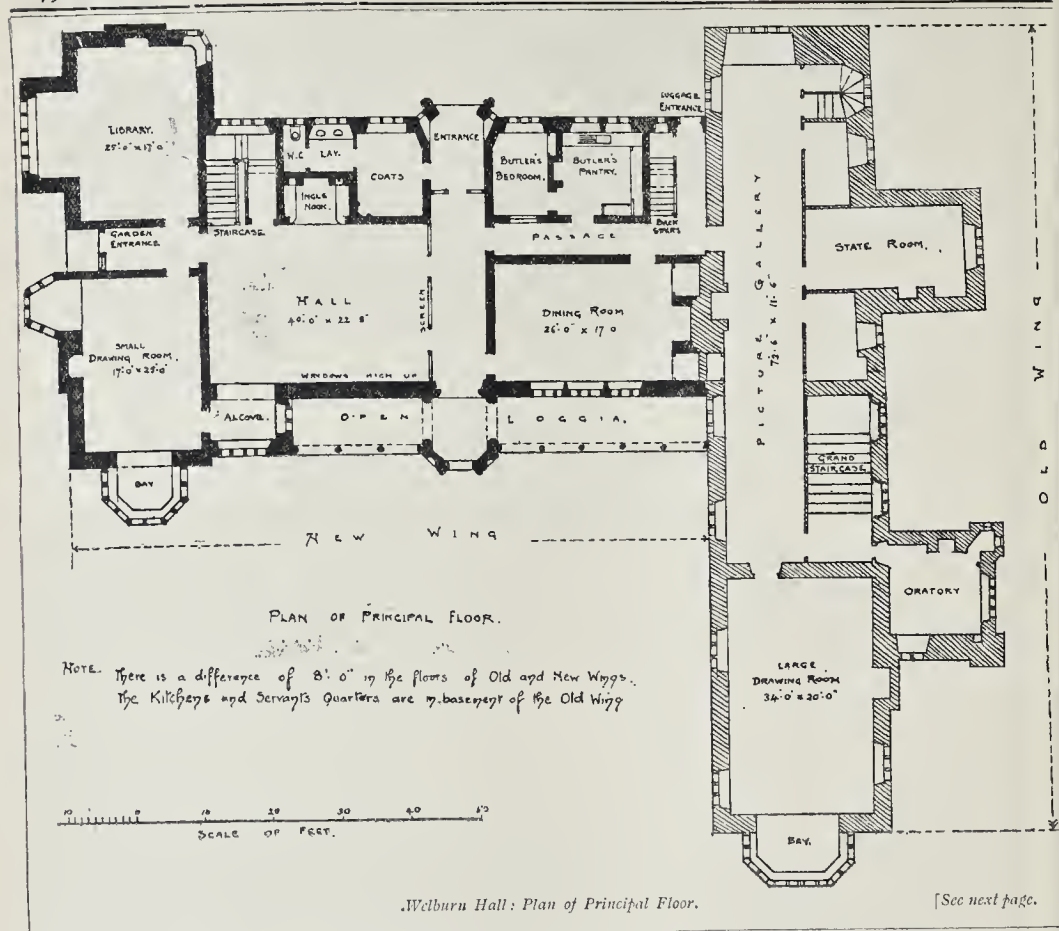
We have received from the Architectural Association a circular in relation to their newly-started day classes in architecture. The Advisory Council consists of eighteen of the leading architects of the day, including three Academicians, *viz.*, Professor Aitchison, Mr. T. G. Jackson, and Mr. Aston Webb.

The following are among the special advantages claimed, and we think rightly, for this course of study:—

Architects feel that pupilage should be preceded by some elementary training preparatory to an office career. Pupils are frequently unable to take advantage of the opportunities offered in an architect's office because they have not previously studied the elements of their work; consequently they are only beginning to learn something about architecture when their articles terminate. A year or two spent in such a school as is now established will enable a student to acquire, at moderate cost, the rudiments of his work, before learning in an architect's office the practical details of his profession. The school will have the further advantage of testing the student's aptitude for the profession. If he should find the work uncongenial he can abandon the pursuit of architecture. Many architects do not care to receive pupils who are beginners, but they would probably take young men if well grounded. In many cases the period of pupilage might be shortened. Students already articulated and unable to attend the studio regularly can make special arrangements for partial attendance if desired. In this case they are also advised to attend the evening lectures. The students will be under the direct control of a thoroughly-qualified architect as master, assisted by such staff as may be necessary.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The sixth and concluding lecture of the course on "Works Management" was delivered by Mr. A. H. Barker, Wh.Sc., B.A., B.S., at the Westminster Palace Hotel, on April 25, the Vice-Chairman of the Institution, Mr. Ernest King, presiding. The lecturer continued the consideration of the question of cost accounts, treating it with special reference to establishment expenses. The methods necessary to obtain accurate results were indicated, and possible sources of error pointed out. Specimens of the books required were illustrated. The principles of the determination of depreciation charges were discussed at some length, and the desirability was urged of reducing all costs to a common basis, and plotting them in the form of curves from which it would be possible to deduce a law, according to which the costs would vary. The various matters involved in the process of estimating were then entered into, the important bearing upon it of a proper system of costkeeping being dwelt upon. At the conclusion of the lecture a vote of thanks was accorded Mr. Barker, and it was announced that the six lectures would be published by the Institution at the earliest possible date. On May 3 a meeting of the Institution was held at the Westminster Palace Hotel, the Chairman, Mr. Percival Marshall, presiding, when the Northcott Prize paper on the question of "How may the best efforts of Employers and Employed be exerted for their Mutual Advantage and for the National Benefit?" which had been awarded to Mr. William Powrie, was read and discussed. The



adjudicators were Mr. J. A. F. Aspinall, of Manchester; Mr. A. Denny, of Dumbarton; and the donor of the prize (value five guineas), Mr. W. H. Northcott, of London. The author, in commenting upon the relations existing between the employer and employed of the present day, expressed the fear that each class wrongly regarded the other as an antagonist, instead of recognising that their interests were identical. The modern factory system had tended to this condition, and the increase of limited liability companies (whose proprietors had only a financial interest in them) had also done much to discourage the formation of mutual friendship. Trades-unions had not been an unmixed blessing, much bitterness of feeling having been caused by unreasonable interference between employer and employed. Referring to the attitude of the employer, it was unfortunately too common a practice for employers and managers to keep aloof from their men and to treat them as if they were of an inferior race. The workman might hold a different opinion to the foreman as to the best and quickest method of executing certain work. Due consideration should be given to it, and means adopted in every possible way to show that the men's interest in their work was not disregarded. A common cause of increased cost of production was due to the objection of the workmen to run machines at the maximum speed, their stated reason being that more men would be required to do the same amount of work, but the actual result was that future orders were sent abroad, and work altogether lost to the operatives of this country. Time and energy were often spent in devising means for reducing the cost of production, but were rendered to a large extent abortive by the indifference or covert opposition of the workman, who really had it in his power to materially aid to success. There would always be a difficulty in getting human beings,

whether employers or employed, to do all they ought; but a more perfect education, the encouragement of higher ideas in both classes to assist in overcoming ignorance, indolence, and prejudice, would do much to bring about a better understanding between them to their mutual advantage and for the benefit of the nation at large.

Illustrations.

ST. ANNE'S CATHOLIC CATHEDRAL, LEEDS.

THE perspective view of the above shows the west front towards Cookridge-street, and the north towards George-street.

A full description of the proposed building was given in the *Builder* of March 9 last, together with illustrations of ground plan and west and south elevations. It may, perhaps, however, be of interest to furnish a few particulars of the present cathedral and schools.

The present St. Anne's Cathedral, which occupies a very prominent position in Leeds, is a very well-known building, and with its tower and spire at the north end of Park-row forms one of the old familiar architectural features of Leeds, which some of the old residents will be sorry to lose.

The cathedral was opened in the year 1838, the architect being Mr. John Child. The style is Perpendicular Gothic.

The interior is, considering its actual height, very successfully designed, as a great effect of loftiness is achieved by the architect; and the interior was beautifully decorated from the designs of Mr. Bentley, the architect for the Catholic Cathedral at Westminster. The reredos behind the high altar, which is in wood coloured and gilt, is very rich and effective in detail, and was designed by Pugin,

and erected in 1842. The school adjoining the church was erected in 1845, and opened by Daniel O'Connell.

St. Anne's took the place of St. Mary's in Lady-lane, which was built in 1799, on what is supposed to have been the site of a Catholic Chapel dedicated to the Blessed Virgin in Catholic times.

The present cathedral is being built of Horsforth stone, a local Yorkshire grit stone. The parish church is also built of the same stone, as also St. George's Church in Leeds.

J. H. EASTWOOD.

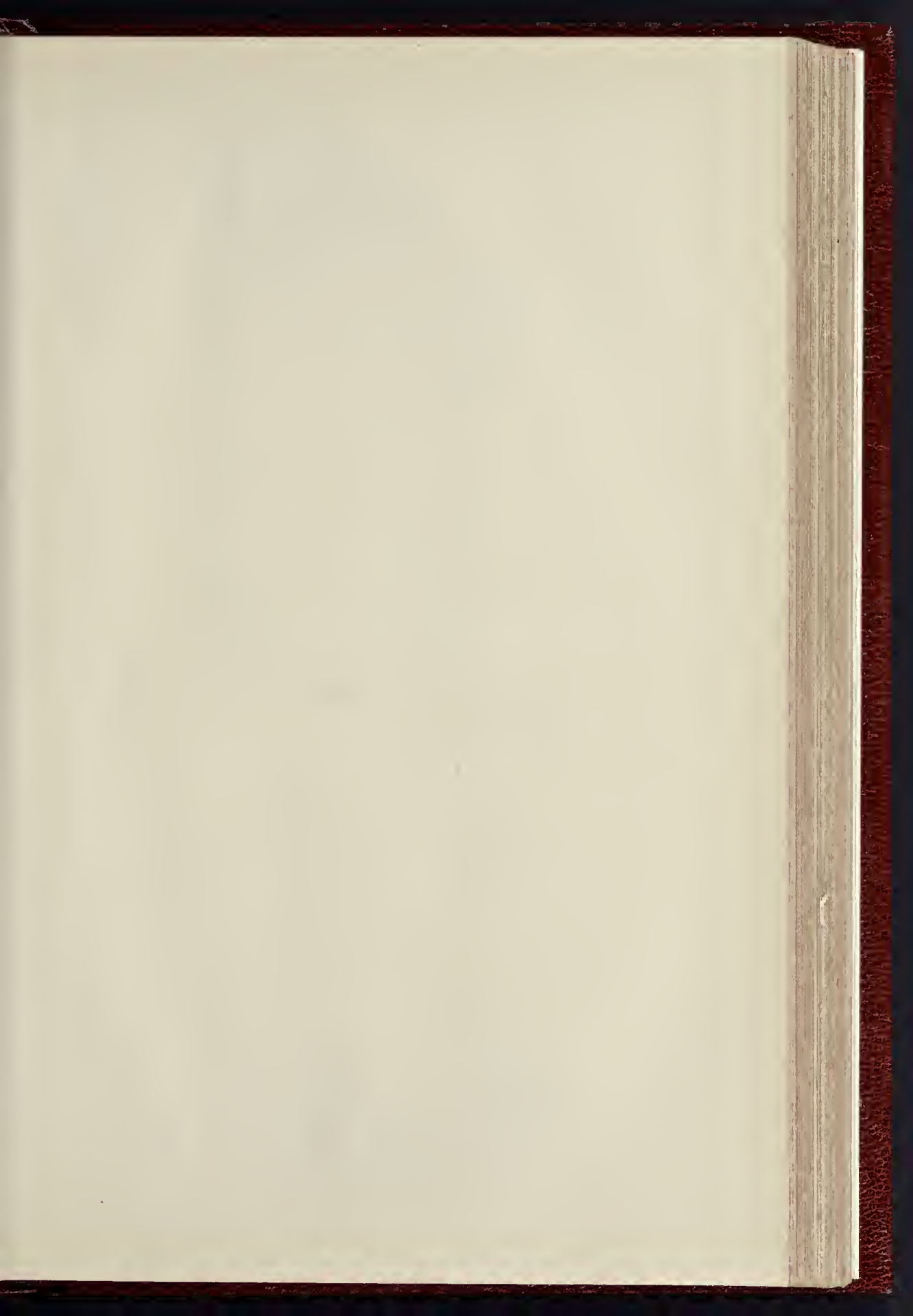
TISSINGTON HALL.

THIS is an old house dating from the time of Elizabeth, and was built by the family now living in it. The back additions are of the time of Queen Anne. The house is in the Peak district, and is a splendid example of mason's work in the beautiful Derbyshire stone. The house is full of rich oak panelling, but throughout this has been covered with painter's graining imitating the genuine article which lies beneath.

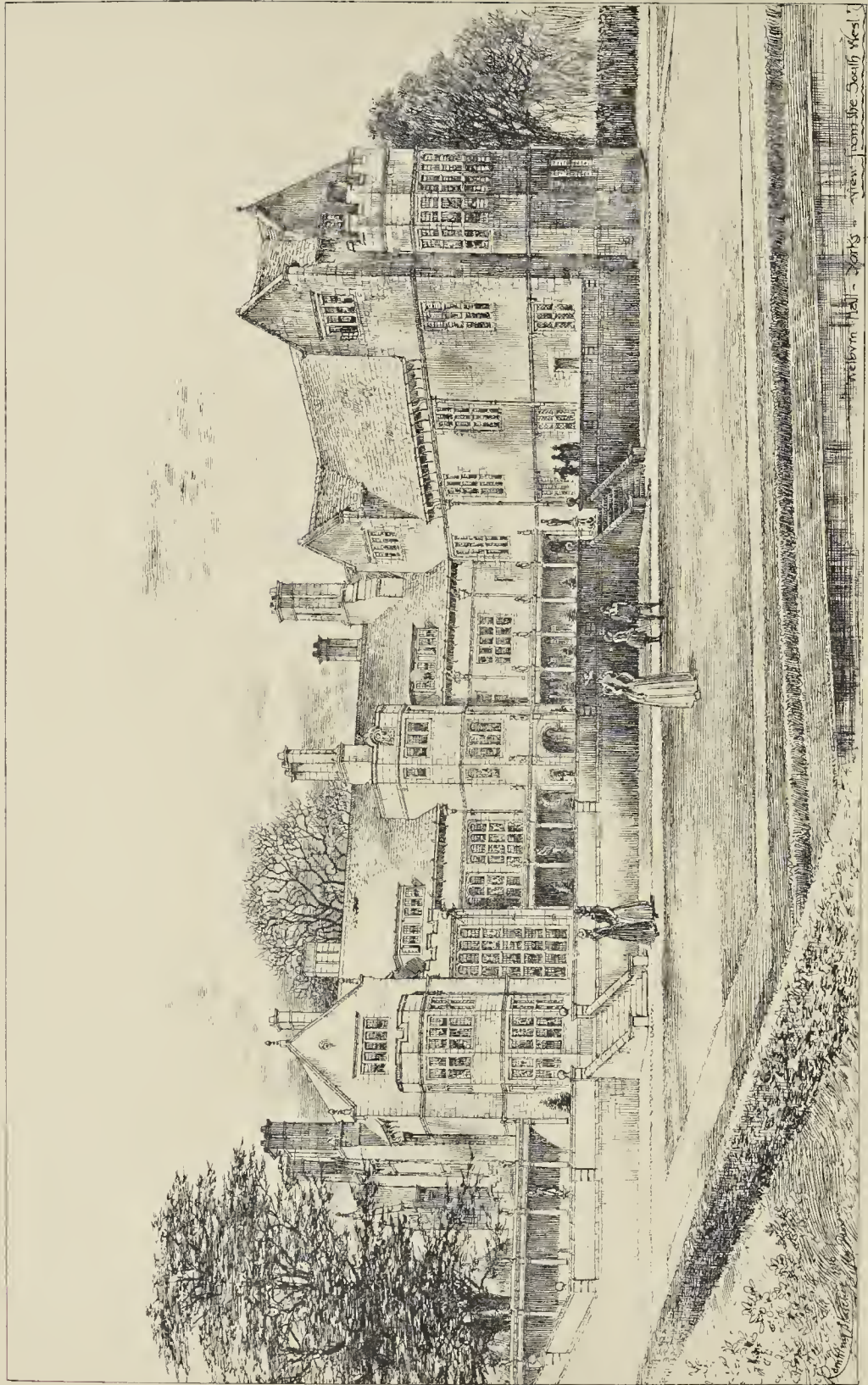
The terraced garden and the pictures here are well known, and generally the house is full of interesting things. Various works are in hand with the object of making the house a more liveable one—new roofs, new drains, heating, a kitchen, and sundry servants' rooms. The block of building on the right was an addition of the middle of last century, and without interest; its walls have been retained, but the whole interior remodelled; through neglect it had got into bad repair, and the only alternative was its demolition.

It is interesting to note that in cleaning off the panelling in portions the oak was found to be inlaid with coloured woods—satinwood, ebony, &c.

The works have been going on for a long time, and are being carried out by Messrs.



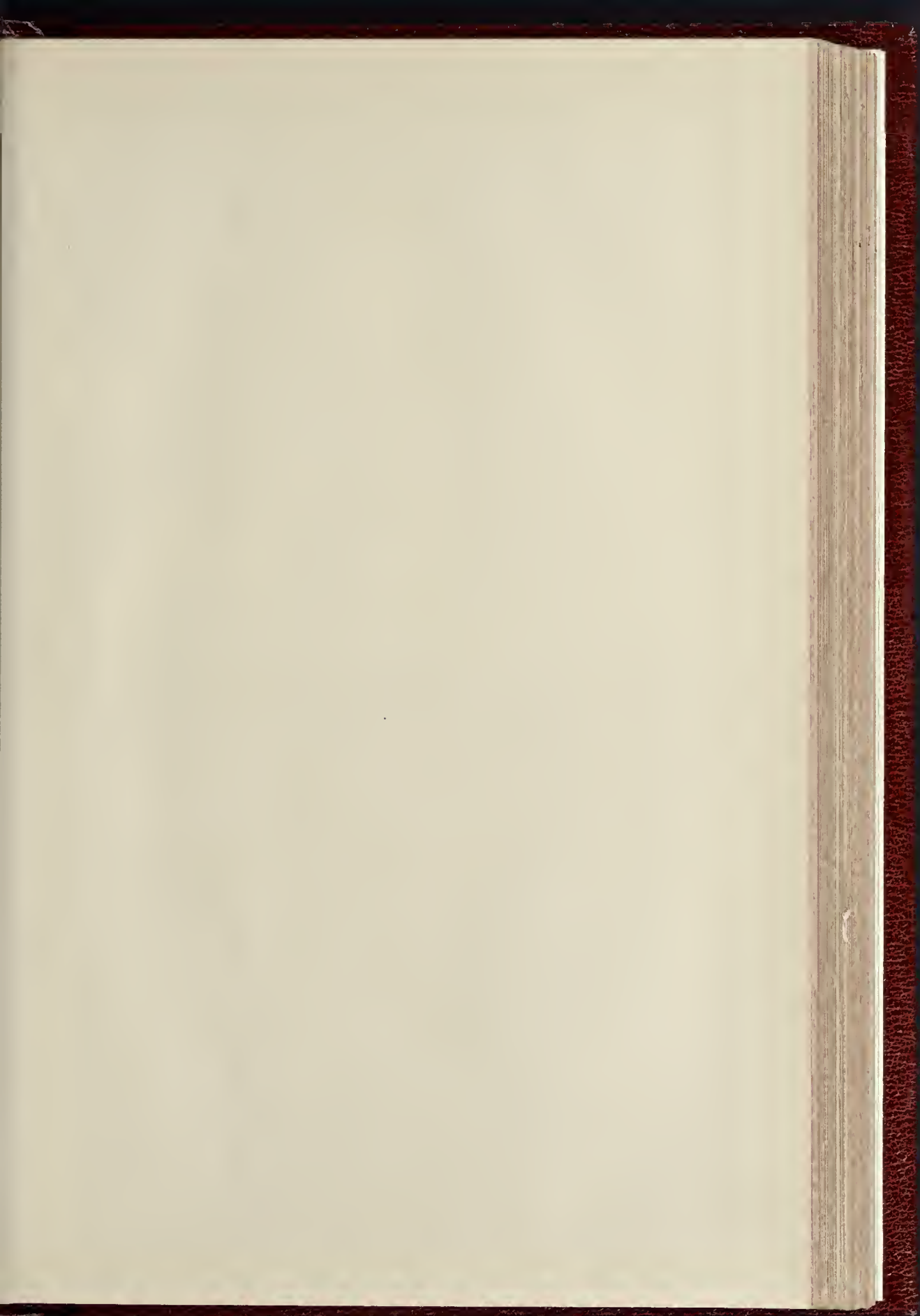
THE BUILDER. MAY 18. 1901



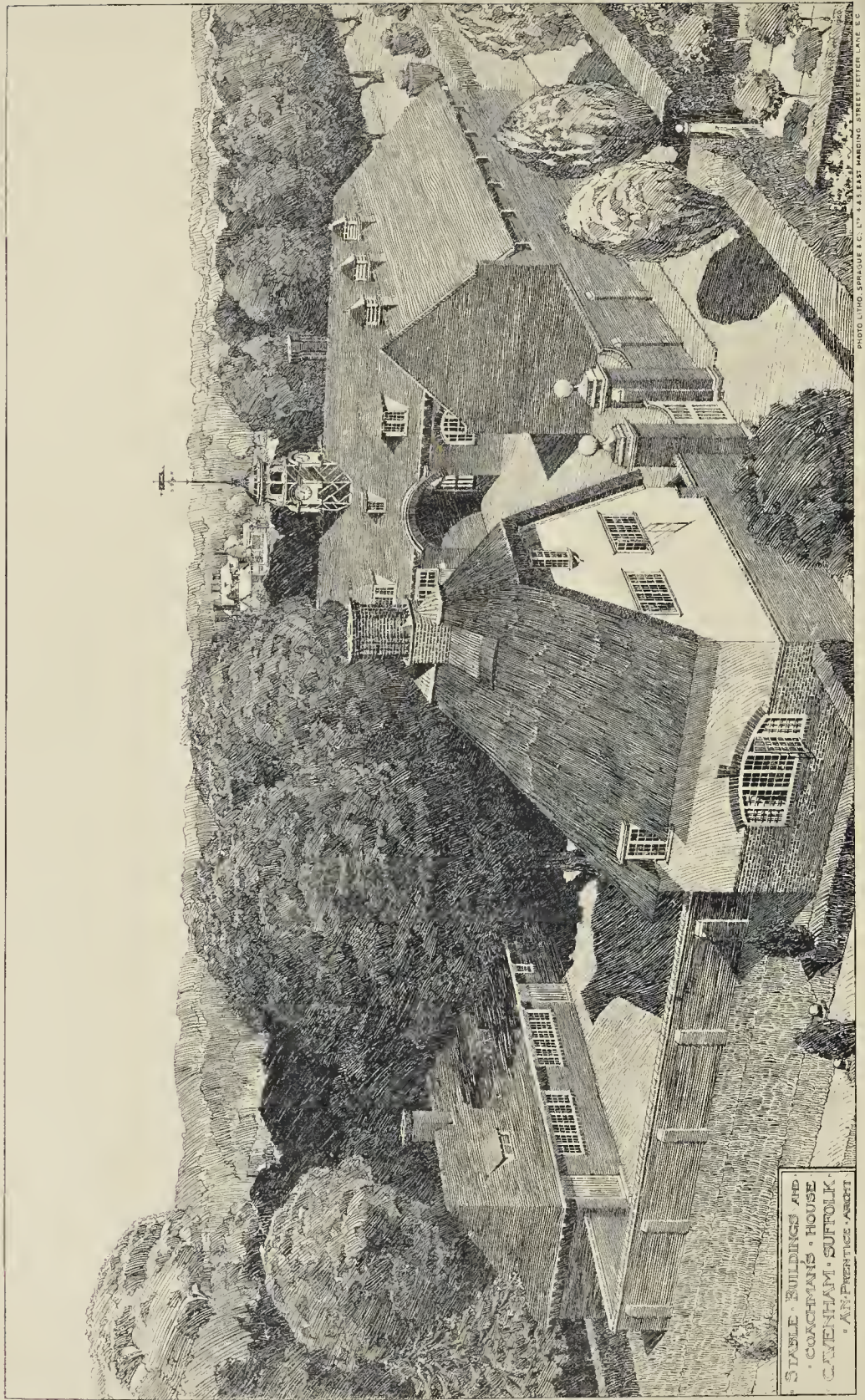
Welburn Hall - Yorks - view from the South West

PHOTOGRAPH BY SPAGGIE & CO. LTD. 44 & 45 EAST HARDING STREET FETTER LANE E.C.

WELBURN HALL, YORKSHIRE: VIEW FROM SOUTH WEST - MR. W. H. BRIERLEY, ARCHITECT



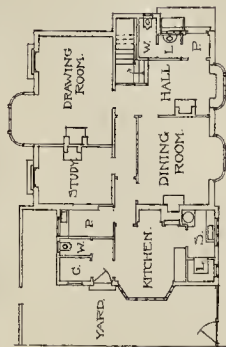
THE BUILDER, MAY 15, 1901



STABLE BUILDINGS AND
COACHMAN'S HOUSE
COTTENHAM, SUFFOLK.
ARCHITECTS: ARTHUR
CANTON, 10, EAST HAMBURG STREET, LONDON, E.C.

HOUSE, DE PARYS AVENUE,
BEDFORD.

AN PRENTICE, ARCHT.



SCALE OF 0 5 10 20 40 FEET.

GROUND-FLOOR PLAN.

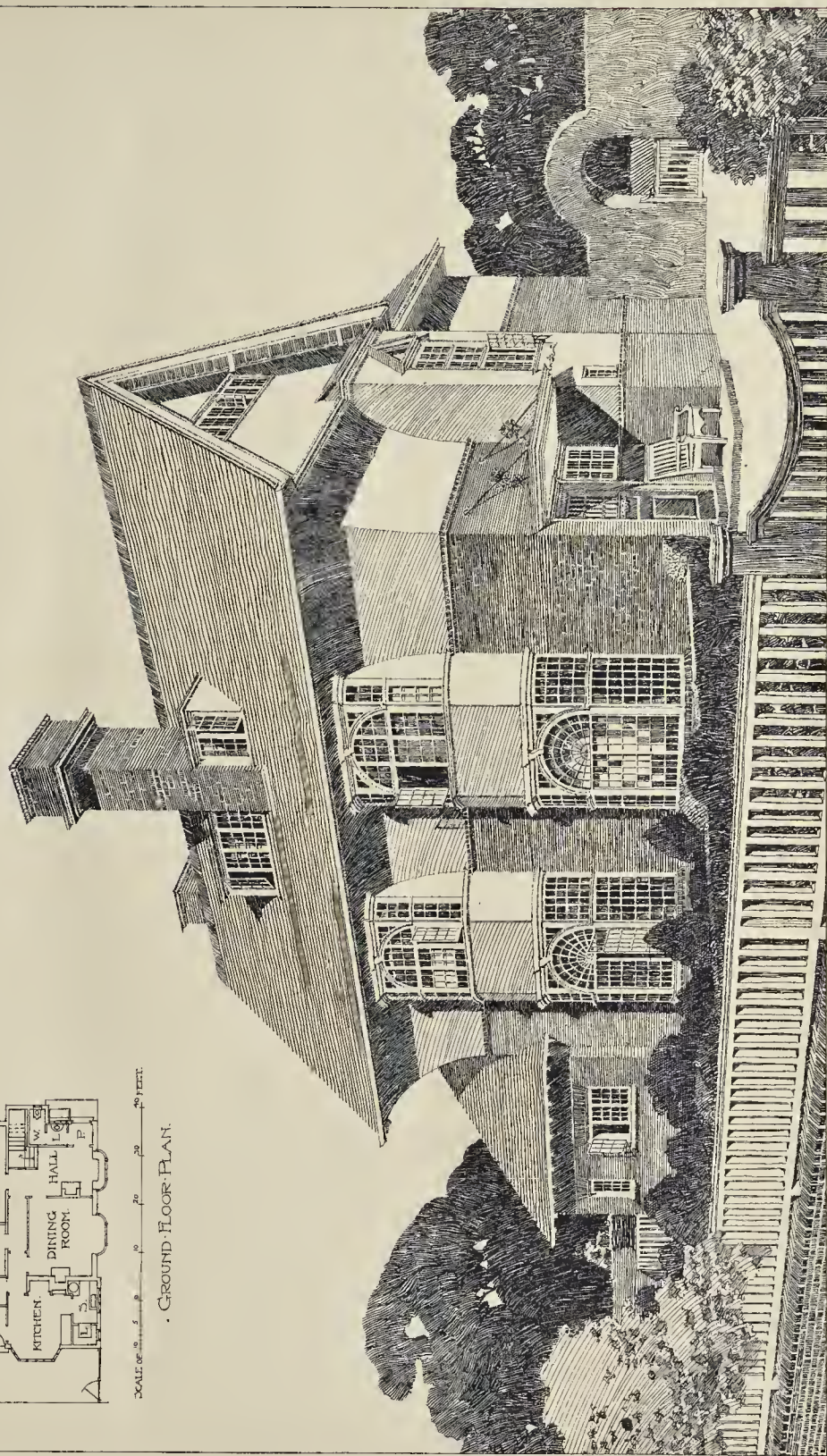


PHOTO LINDS BRANQUE & CO. 445 WEST ARCHING STREET, CHICAGO, ILL.

OXFORD
SCHOOL-BOARD
NEW-INN-HALL
STREET-SCHOOLS
LEONARD-STOKES-ARCHT.

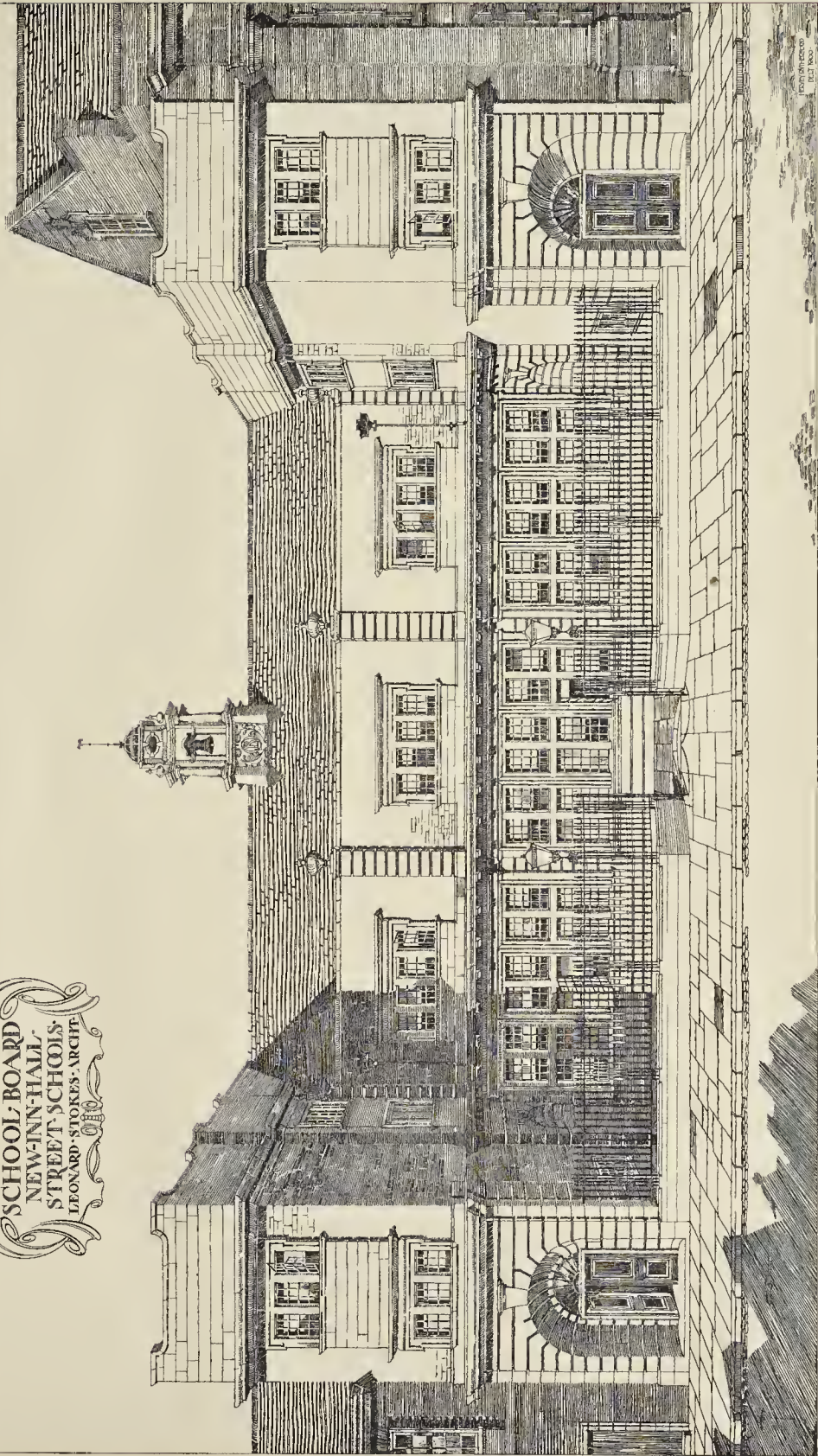
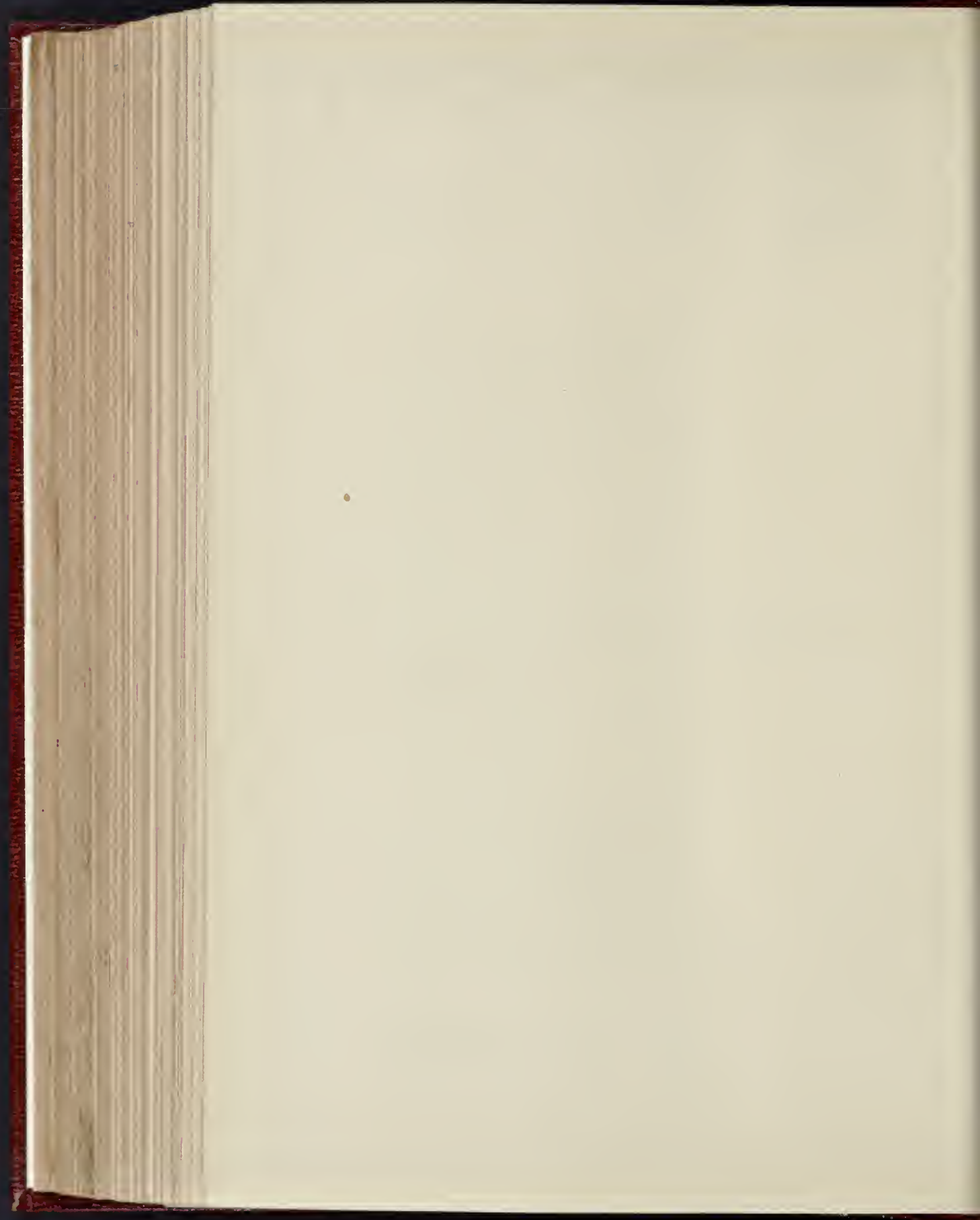
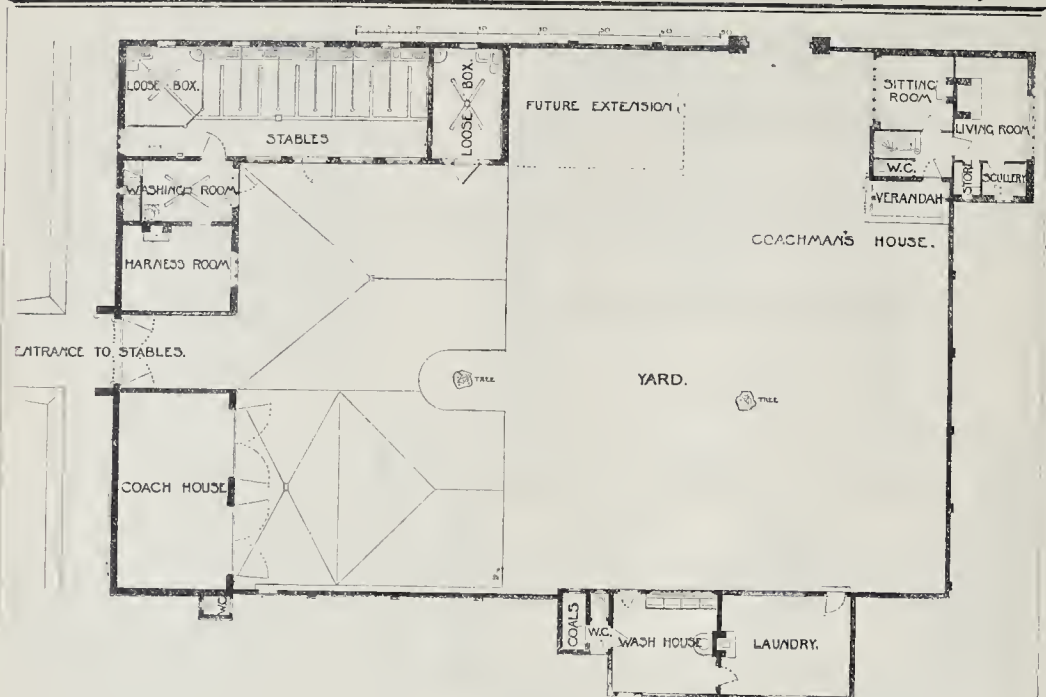


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Stable Buildings, Cavenham. Plan.

[See preceding page.]

W. Marchant, Paddock Wood; H. G. Marrion, London; W. H. Masters, Southampton; D. B. Maxwell, Ipswich; J. Michell, London; R. W. Mitell, Wye; A. W. Moore, London; I. C. Morrison, St. Albans; C. Murdock, Wye; *D. L. Paton, London; J. Peirson, Wye; W. G. Percival, Brent Knoll; A. E. Petter, Bristol; W. T. Pilditch, London; F. W. H. Piment, London; F. E. Pitts, London; J. Rawlence, Wilton; J. Roberts, Chester; L. E. Salt, Shrewsbury; J. L. Schneider, Maidstone; W. G. Shipwright, London; J. W. Smith, Hull; R. Spence, Glynde; C. F. Stedman, Cranleigh; P. C. Stewart, Preston; C. W. Surrey, London; F. J. Talbot, London; R. Tanner, London; W. H. Tanner, Beckenham; R. L. Taylor, Leighton Buzzard; A. E. Terry, Ashted; S. G. P. Titterton, London; H. P. Ward, Redhill; A. S. West, London; C. M. Wilford, Ainstable; E. J. Wilson, London; W. R. B. Wiseman, Chorlton-cum-Hardy; H. J. Wonnacott, London; H. M. Wright, Stapleford; W. B. Wright, London; H. C. Wyley, Breighton.

Irish Candidates.

A. H. Lee-Norman, Ardee, co. Louth; H. J. O'Reilly, Booterstown, co. Dublin; E. A. Penrose, Ferrysbank, co. Kilkenny.

Scottish Candidates.

A. J. Mitrlees, Kilmarnock; J. C. Peace, Edinburgh.

The following Professional Associates have passed the Fellowship Examination in Division IV. —

J. H. Addie, Llanover, Abergavenny; A. Allsbrook, London; H. G. Assiter, London; F. G. Barker, London; H. P. Basley, Bickley; C. W. Berry, London; L. T. Bigg, Strathfieldsaye; T. C. Bliss, London; F. G. Brooker, Sevenoaks; A. A. Brown, Croydon; E. V. Bruton, London; G. J. Bruzard, London; H. Burr, Rushden; F. H. Burrows, Ashford; A. K. Burtenshaw, Hallsbam; R. R. Burton, London; C. Chart, Croydon; F. L. Chattell, Chislehurst; N. Clark, jun., Pitt Hill; E. S. Clarke, London; W. J. Cochrane, Hutton-le-Hole; E. A. Cook, London; F. V. Cullen, Gunnersbury; C. A. Daubney, London; H. H. Dunstall, Chatbam; J. W. Earle, Woolton; A. C. Ellis, London; A. E. Fair, Wigan; R. Fisher, London; H. Gale, Oxon; H. A. A. Gate, London; W. F. Genge, jun., East Grinstead; H. S. Hancock, jun., St. Austel; T. P. Hartley, London; R. C. Hassett, London; L. G. Hawkins, King's Lynn; R. F. Hindmarsh, Newcastle-on-Tyne; A. J. Hooley, Derby; A. E. Hooper, St. Albans; A. E. Howes, London; G. Howland, Amersham; G. W. Hunt, Malvern; H. D. Jones, London; J. P. Martin, Salisbury; T. J. Meaby, Wimborne; F. E. Molvneux, Wallington; C. S. Orwin, Edenbridge; W. E. K. Palmer,

* Driver Prize and Penfold Silver Medal.

New Malden; F. P. Pratt, London; H. V. Raffety, High Wycombe; D. W. Reeve, Sutton; J. Roberts, Towyn; E. W. Saunders, London; G. Stanford, London; F. W. S. Stanton, London; H. C. Stokes, London; I. Thomas, Cardiff; *W. E. Trent, London; A. R. Upsdale, London; T. B. Wacher, Canterbury; *H. A. C. Warrington, London; S. P. Wigley, Winslow; A. C. Williams, Sparsholt; R. E. H. Williams, London; J. E. Wood, Sunbury-on-Thames; H. G. B. Wyatt, Chichester.

Irish Candidates.

E. A. Gibbon, Waterford; G. P. Stewart, Dublin; H. P. Stewart, Dublin.

Scottish Candidates.

J. Matber, Brodick; H. Welsh, Motherwell.

The following Candidates passed the direct Fellowship Examination in Division V. —

C. E. Carr, Newcastle-on-Tyne; G. B. Ewing, Edenbridge; A. Gordon, London; W. R. Hobson, London; C. E. Sturt, Wansted.

Twenty Candidates, not included in the above list, passed the examination in Divisions II, and III, as a whole, but failed in their typical subjects. Thirteen Candidates, who passed the examination as a whole in Divisions IV, and V, also failed to pass in their typical subjects. Fifteen out of fifty-four Candidates in the various divisions who came up for re-examination in their typical subjects have failed again this year. It is open to all these forty-eight Candidates to offer themselves again for examination on their typical subjects in March, 1902.

ARCHITECTURAL SOCIETIES.

LEICESTER SOCIETY OF ARCHITECTS.—The twenty-eighth annual Report of the Leicester and Leicestershire Society of Architects shows that at the time of issuing the Report the Society numbered eleven honorary members (among whom are two distinguished water-colour artists, Mr. J. Fulleylove and Mr. James Orrock), forty-five members, twelve Associate members, nineteen assistant members, and thirteen student members. Mr. S. Perkins Pick has been re-elected President. The Council elected consists of Messrs. A. E. Sawday, A. H. Paget, J. Goodacre, and W. A. Catlow, members; and Messrs. A. Herbert and S. Harrison, jun., Associate members. Mr. Stockdale Harrison is Treasurer, and Mr. Howard H. Thomson Hon. Secretary.

* Penfold Gold Medal, 1901. † Crawter Prize, 1901.

THE CHURCH CRAFTS' LEAGUE.

THE half-yearly general meeting of the League was held on Tuesday, May 7, at the Vale Studio, Chelsea, the Bishop of Rochester being in the chair.

The subject down for discussion was "The Importance of Reality in Art and Religion." Canon Scott Holland, the first speaker, said that it was important to remember that individuality in art was not a mere eccentric detachment from the spirit of the time, but was the embodiment of the feeling of the great corporate body. In the matter of Church music, much had been said by expert musicians as to the folly of having a precentor to direct the music in churches where the organist was a competent artist. But it was not as if the art was standing alone. It was called in to assist the worshippers, and therefore the precentor was, for the time being, the expert. The same principle applied to all other branches of art, and it was just this that distinguished religious art from secular.

Mr. Henry Holiday dealt at length with the conditions under which the modern journeyman had to live and work. It was impossible, he said, for a man to take any intelligent interest in, or to put his heart into, his work now, because the conditions of modern commercial life had converted him into a mere machine.

Rev. Percy Deamer, the next speaker, said that when one looked at the homes of the people, one saw an utter absence of beauty. Everything was shoddy and cheap. When one looked at the churches, one found much the same thing. Most of the fittings were made to look as if they had cost twice their real price. There was an entire absence of that reserve which went so far towards making a thing beautiful. In music, the Church had formed a tradition, and many of our greatest musicians had been brought up at our cathedrals, where that art had been carefully nurtured, even in the darkest times. The result of this on the nation was striking. For every ten persons who cared for music, there was only found one who had any appreciation of the other forms of art. Again, if the decorations of a church were so vulgar and bad that one's nerves were affected, that it was impossible to worship, one was considered affected if one said so. But if the music at a church was noisy and vulgar and in bad taste, one was considered to have a very plausible reason for staying away.

Mr. Halsey Ricardo said that art was a man's message to his fellow-men. Every artist had to learn all that his predecessors had learned, and then go on beyond them. Thus Mozart, in one age, learned all that could then be learned about music, and built up his own work on that. Beethoven in another age had gone beyond all his predecessors, and still later, Wagner had done the same.*—A discussion followed, in which Miss Loundes, Mr. T. Stirling Lee, and the Rev. A. W. Hutton took part, after which the Bishop of Rochester spoke briefly, and in summing up the results of the discussion warned his hearers against the danger of hopelessness in thinking of the Church's attitude towards art.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Cumberland Borough Council 10,710*l.* for the purchase of lands and property; Shoreditch Borough Council 2,440*l.* for baths and wash-houses; and Camberwell Guardians 50,000*l.* for extension of infirmary.

Main Roads.—The Local Government Taxation Committee submitted a report with regard to contributions from the Council towards the maintenance of certain main roads. Under the London Government Act the power and duty of maintaining about twelve miles of main roads, discontinued since 1870, had been thrown upon metropolitan borough councils. The Hampstead Borough Council desired the County Council to continue to contribute towards the maintenance of such roads, but the committee recommended the Council to reply that they were not prepared to do so. This recommendation was, after discussion, adopted.

Proposed Conference on Housing.—The Housing of the Working Classes Committee recommended that a conference of delegates from the various metropolitan borough councils should be convened, with the view of arriving at a working agreement upon the housing question, and avoiding the danger of competition between two or more public authorities seeking to acquire the same areas.

This was agreed to, and the date of the conference was fixed for June 28.

Theatre Regulations.—The Theatres and Music Halls Committee reported as follows, the recommendations being agreed to:—

"The Council, on February 9, 1892, revised the regulations made under the Metropolitan Management and Building Acts Amendment Act, 1878, Section 12, with respect to the requirements for the protection from fire of theatres, houses, rooms, and other places of public resort within the administrative county of London. These regulations have, in our opinion, resulted in a great improvement as regards the safety of the public in the places of public entertainment which have been built since the year 1892. The experience we have gained, however, in the last nine years has shown us many points on which they need, in the public interest, alteration and improvement, and we have accordingly amended them. The regulations are now amended will show persons who are desirous of building a place of entertainment exactly what is required by the Council. . . . We recommend that the regulations made under the Metropolitan Management and Building Acts Amendment Act, 1878, Section 12, as amended, be approved, and that they be sealed in duplicate."

Seating in Theatres.

"On April 2 last we called attention to the fact that alterations were frequently made in the arrangement of the seating in the pit and stalls of theatres without any intimation being given to the Council, and at our suggestion a letter was sent to the lessees of all theatres stating that it was necessary in the public interest that notice should be given to the Council whenever it was desired to make an alteration, in connexion with the seating arrangements, in the position of the barrier dividing the pit and stalls portions of a premises. In reply we have received letters on several lessees stating that it would be extremely awkward to comply with the request, as alterations had frequently to be made at very short notice. We think that the convenience of the lessees might be met, with due regard to the public safety, if each lessee who is desirous of being allowed to make alterations in the arrangement of his pit and stalls seating was to inform the Council of the extreme limits within which he was desirous at any time moving the barrier between the

pit and stalls. It would be easy for us to determine the limits within which the barrier might be moved without the safety of the audience in either part of the theatre being injuriously affected, and so long as alterations were kept within these limits and the regulations respecting the width of gangways and the area of seating to be assigned to each person were observed, there would be no necessity for notice to be given to the Council. We recommend that a circular letter be sent to the lessees of all theatres stating that, with a view to obviating the necessity of lessees giving notice to the Council on every occasion upon which it is desired to make an alteration in the position of the barrier separating the pit and stalls seating, the Council will be prepared to determine, on application being made by the lessee, the extreme limits within which the barrier in question may be moved without further notice being given to the Council."

Tenders.—The following tenders have been accepted:—

Docking and the repair of s.s. *Barking*—Mills & Knight, 1,122*l.* 12*s.* 6*d.*

Workshops, Feltham School—Herring & Son, 102*l.*

New Open Space.—The umpire having awarded 10,560*l.* upon a claim of 17,792*l.*, for the purchase of Albert-square, Ratcliff, the Parks Committee asked for authority to expend 640*l.* on laying out the grounds. This was granted.

Workmen's Trains.—Dr. Cooper moved:—"That, having regard to the conditions imposed upon railway companies in return for concessions from taxation and the present extent of over-crowding in London, it be referred to the Housing of the Working Classes Committee to invite all the railway companies having stations within the County of London to confer with it with a view of endeavouring to arrive at a complete scheme for the extension of workmen's trains at the lowest fares; and that if a satisfactory scheme fails to be accomplished, the Committee do report its full requirements to the Council and the objection of the companies thereto."

Mr. Dew seconded the motion, which was supported by Mr. Cousins, Mr. Beachcroft, and others.

The motion was adopted and referred to the Parliamentary Committee.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage and Projections.

Marylebone, East.—A projecting balcony at the fourth floor level, to extend along the south and east faces of a block of residential flats, to be known as Harley House, on the north side of Marylebone-road, St. Marylebone, at the corner of Brunswick-place (Messrs. Boehmer & Gibbs for Mr. C. J. Hinsley).—Consent.

Battersea.—A transept and tower on the north side of St. Mary's Church, Albert Bridge-road, Battersea, to abut upon Park-road (Mr. J. S. Quilter for the Rev. Canon Erskine Clarke).—Consent.

Battersea.—A church on the west side of Wycliffe-road, Battersea (Mr. G. H. Fellowes-Prynn for the Rev. F. L. Goslett).—Consent.

Fulham.—Retention of a shed, used as a stable, at the rear of No. 55, Bramber-road, Fulham, abutting upon Mulgrave-road (Mr. W. H. Stilgoe for Mr. W. Roberts).—Consent.

Greenwich.—A wood and tile pent over the entrance to a house in course of erection on the south side of Manor Way, Lee-road, Lee (Mr. L. V. Hunt for Messrs. L. Whitehead & Co.).—Consent.

Greenwich.—Rebuilding of the Baptist Church, Shooter's Hill-road, Blisheath (Mr. J. Willis for the Rev. W. L. Mackenzie).—Consent.

Hackney, North.—A one-story addition to No. 291, Green Lanes, Stoke Newington (Mr. A. H. Jones).—Consent.

Hammersmith.—A greenhouse at the nursery adjoining Oak Lodge, Uxbridge-road, Shepherd's Bush (Mr. G. Frothingham for Mr. J. Harden).—Consent.

Marylebone, West.—The retention of a wood and glass conservatory in front of No. 55, Circus-road, St. John's Wood (Mr. A. G. Langdon for Miss M. Studholme).—Consent.

Westminster.—A one-story porch at the entrance to No. 169, Victoria-street, Westminster, at the corner of Carlisle-place (Messrs. Edmeston & Gabriel for the London and South-Western Bank, Limited).—Consent.

Strand.—That the Erasme Company, Limited, be informed that the Council is not prepared to permit the retention of the wood and iron sign in front of No. 117, Oxford-street, Soho.—Agreed.

Chelsea.—Retention of a wooden trellis screen at the side of No. 456, King's-road, Chelsea, abutting upon Hobury-street (Mr. T. J. Monaghan).—Refused.

Dulwich.—A one-story shop in front of an existing house and shop on the east side of High-street, Dulwich (Mr. W. J. Studd).—Refused.

Fulham.—An addition at the rear of No. 62, North End-road, Fulham, to abut upon Gwendvur-road (Mr. S. G. Goss for Mr. J. Elmslie).—Refused.

Hampstead.—A conservatory, at the first-floor level, in front of Belgrave Mansions, Belgrave-road, St. John's Wood (Messrs. W. Whiteley, Limited, for Mr. C. M. W. Turner).—Refused.

Islington, North.—Retention of an addition at the rear of No. 214, Seven Sisters-road, Islington, abutting upon Coleridge-road (Mr. R. Midworth for Mr. J. Portance).—Refused.

Kensington, South.—An iron and glass shelter at the entrance to No. 10, Bolton-gardens, Kensington (Messrs. W. T. Allen & Co. for Mr. L. Samuel).—Refused.

Lewisham.—Four houses on the west side of Shell-road, Lewisham, at the corner of Sandrock-road (Messrs. Hodson & Whitehead for Messrs. Hodson Brothers).—Refused.

Lewisham.—A house on the east side of Bromley-road, Catford, northward of a house known as Ormound (Mr. W. Bailey for Mr. W. H. Wagstaff).—Refused.

Wandswoth.—Five one-story shops on the south side of Lower Richmond-road, Putney, westward of Martyn's Waterman's School (Mr. F. A. Fowell for Mr. A. C. Ballard).—Refused.

Westminster.—An iron and glass shelter in front of No. 137, Victoria-street, Westminster (Mr. E. Stones for Mr. A. Stinner).—Refused.

Width of Way.

Lewisham.—A boundary wall on the flank of No. 18, Lansdowne-road, Lee, at less than the prescribed distance from the centre of Church-passage (Mr. G. Mitchell).—Consent.

Peckham.—Two cottages on the south side of Green Hundred-road, Peckham Park-road, Peckham, at less than the prescribed distance from the centre of the street (Mr. H. J. Collis for Mrs. McDonald).—Consent.

Kennington.—A two-story building at Five laundry, Southville, Lambeth, at less than the prescribed distance from the centre of Priory-mews (Messrs. Reeves & Styche for Mr. S. Fernie).—Refused.

Wandswoth.—A stable building on the east side of Brewhouse-lane, Putney, at the corner of Memel-place (Mr. H. G. Leslie for Dr. Weistad).—Refused.

Space at Rear.

Peckham.—A modification of the provisions of Section 41 (1) (vi) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a house on the west side of Hooks-road, Peckham, next the house numbered 28 in such road, with an irregular open space at the rear (Mr. A. E. Mullins for Mr. D. S. Whitcher).—Consent.

Deviations from Certified Plan.

St. Pancras, South.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed erection of a stable, with living rooms over, on the site of No. 1, Doughty-mews, St. Pancras (Messrs. Thurgood & Martin for Mr. A. German).—Refused.

Lines of Frontage and Width of Way.

Woolwich.—Three houses at the south-east end of Elm-grove, The Shade, Plumstead, (Mr. A. E. Habershon for Mr. Stevens).—Consent.

Hackney, Central.—Houses, with shops on the ground floor, on the site of Nos. 3b, 5, 7, 9, 11, 13, and 15, Tower-street, London-fields, Hackney, at less than the prescribed distance from the centre of the street (Mr. J. Hamilton for Mr. S. K. Prager).—Consent.

Lines of Frontage and Space at Rear.

Peckham.—A three-story house, with a one-story shop in front, on part of the site of No. 103, Ryelane, Peckham (Mr. A. Garner for Mr. W. Wilson).—Refused.

Lines of Frontage and Construction.

Rotherhithe.—A steel grain-shoot across Church-passage, Rotherhithe (Messrs. W. A. Crips & Sons for Messrs. Dudin & Sons).—Consent.

St. George, Hanover-square.—That permission be given to Mr. W. J. Smith to retain a projecting sign in front of No. 7, Woods-mews, Park-lane, St. George, Hanover-square, extending beyond the general line of buildings in that street.—Agreed.

Width of Way and Construction.

Newington, West.—A playshed in the playground of the Harper-street School, New Kent-road, Newington, at less than the prescribed distance from the centre of Arnott-street (Mr. T. J. Bailey for the School Board for London).—Consent.

* Is Mr. Ricardo quite sure of that?—Ed.

Formation of Streets.

Battersea.—That an order be issued to Mr. W. M. Wilkins, sanctioning the formation or laying out of new streets for carriage traffic, on the north side of Sheepcote-lane, Battersea (for the Metropolitan Borough of Battersea).—Agreed.

Islington, West.—That an order be issued to Mr. F. Matcham, sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Holloway-road to Waiters-road, Islington (for Mr. F. W. Purcell). That the name Macready-place be approved for the new street.—Agreed.

Lewisham.—That an order be issued to Mr. J. W. Webb refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of Crofton Park-road, Brockley.—Agreed.

Lewisham.—That an order be issued to Mr. W. H. Dawson refusing to sanction the formation or laying out of four new streets for carriage traffic out of the east side of Bromley-road, Catford (for Mr. H. W. Forster).—Agreed.

Height of Buildings.

Islington, West.—A theatre building on the south side of Holloway-road, Islington, to exceed in height the width of a proposed new street to lead from Holloway-road to Waiters-road, upon which new street the building will abut (Mr. F. Matcham for Mr. F. W. Purcell).—Consent.

Cubical Extent.

Bermondsey.—The omission of double iron doors in the party walls between the north wing of a factory building known as Grange Mills, on the south side of Grange-road, Bermondsey, and the two staircases forming approaches to that wing, whereby such wing and staircases will together exceed in extent 250,000, but not 450,000 cubic feet (Messrs. Gordon & Gunton for Messrs. A. Ross & Co.).—Consent.

Means of Escape from Top of High Buildings.
Strand.—Means of escape in case of fire on the fifth, sixth, and seventh stories of an addition to the Hotel Cecil, on the site of Nos. 76-88, Strand, between Carting-lane and Ivy Bridge-lane (the upper surface of the floors of which stories are above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. J. Sawyer for the Hotel Cecil, Limited).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

THE ENGINEER OR ARCHITECT AS ARBITRATOR. By Chas. Currie Gregory. (W. Clowes & Sons.)

A BOOK OF DESIGN AND DRAWINGS OF THE COLLEGE OF ARCHITECTURE. (Cornell University, U.S.A.)

NOTES ON THE LIFE AND WORK OF THOMAS RICKMAN, F.S.A. Collected by his Son, T. Miller Rickman, F.S.A. (G. J. W. Pittman.)

TRANSACTIONS OF THE SOCIETY OF ENGINEERS FOR 1900. Edited by Perry F. Nurse, Secretary. (E. & F. N. Spon.)

Correspondence.

To the Editor of THE BUILDER.

SOUTH KENSINGTON EXAMINATIONS.

SIR,—The examination held by the Board of Education in Building Construction on the 11th inst. has caused a shock to many thousands of hard-working and earnest students throughout the country. For many years past, papers have been set increasing slightly in difficulty, but free from erratic vagaries, and on the whole covering the ground of the syllabus in a straightforward manner. That the examination was a fair one is shown by students year after year being placed in the order that their known capabilities foreshadowed. I refrain from discussing the general question of the value of the certificates and what their possession may be taken to indicate, and beg leave to quote three questions just given:—

“65. What is meant by saying that the height to which a pyramid of any building material may be raised is three times the height of a column of uniform section? Show how, by attending to a cardinal principle of construction, you can build a tower of brick or stone of very great height.

“66. With reference to the previous question: A brick tower of efficient design is built on a square base 60 ft. by 60 ft.; it is 500 ft. high. Allowing 6 tons per square foot as the safe load on a cross section, and taking 120 lbs. as the weight of a cubic foot of brickwork, what is the area of the top? What weight in tons may be safely placed on the top? Given: $\log_{10} 111 = 2.04532$, $\log_{10} 112 = 2.04921$, $\log_{10} 4086 = 3.61130$, and $\log_{10} 36 = 1.55630$. You may assume 1 ft. courses.

“69. Design and sketch a double labourer's dwell-

ing in a rural district; show the necessary conveniences and the enclosure. The site is close to a public road. Take accurate quantities and price them.”

These are samples of five that have to be completed in four hours. Now, I would ask, first, are questions 65 and 66 such as we should train students to expect in an examination in building construction, and, second, how any living man work No. 60 in forty-eight minutes? It should be noted that equal marks were apportioned to each of these questions.

HENRY ADAMS.

THE PROPOSED LIVERPOOL CATHEDRAL.

SIR,—It would seem from what appears in a contemporary—though I have searched in vain in your current number for any tidings of the matter—that some design for a cathedral church is adopted and in process of being collected for. Not a word is there as to the adoption or adaptation of any one of the competition designs prepared for the St. John's Churchyard site.

A hope for something as stately as the effort at Truro may be too visionary, but there may be a more excellent way than cutting up interesting parish churches (Manchester, Wakefield, and Newcastle to wit), which one would prefer to see repeated than the perpetration of a huge conical, which, of our time, designs the late competition called forth, the late lamented Bishop is said to have sympathetically striven for. I believe that another competition ought to be called for, in recognition of the fact that there is well-nigh a fresh generation of architects capable of expressing on paper the prospective requirements, and giving sound suggestions for meeting them.

A sort of church house on one side of an enclosure and a spacious and lofty cathedral on the other would be worth subscribing for, and possibly worth while competing for; but to rush something through without giving the profession a fair chance is not quite what we may have a right to expect, and yet this is what we may come to if subscribers do not have a care that their contributions are devoted to a bona-fide design and not a sort of basilica.

** We are quite in sympathy with the general purport of our correspondent's letter; and if it be true that a design for the cathedral is to be prepared by the City Surveyor, we can only say that it is a most miserable anti-climax after the important competition held a good many years ago, and which excited so much public interest. Either one of the former competitors ought to be recognised, or there should be a new competition. We may however point out to “H. W.” in view of the last paragraph of his letter, that there is no reason that we know of why a “basilica” should not also be a “design.”—ED.

OBITUARY.

MR. ARTHUR CATES.—We regret to announce the death, in his seventy-third year, at his residence, No. 12, York-terrace, Regent's Park, of Mr. Arthur Cates, formerly of No. 7, Whitehall-yard, S.W. Mr. Cates was born in London on April 29, 1829, and received his earlier education at King's College School, Strand. He then became a pupil of Sydney Smirke, R.A. He was elected an Associate member of the Royal Institute of British Architects in 1856, and a Fellow in 1874; he was for some while a member of the Council, and Vice-President during the period 1888-92; in 1847 he had been elected a member of the Architectural Association. He was also a Fellow of the Surveyors' Institution. In 1870 Mr. Cates succeeded Sir James Pennethorne in the appointment of Architect to the Land Revenues of the Crown, under the Commissioners of H.M. Woods and Forests. As Surveyor to the Honourable Society of the Inner Temple, he designed the archway and gate-house which form the entrance from Tudor-street into King's Bench-walk (1887). For some while he was honorary secretary to the Council of the Society of Biblical Archaeology, and honorary secretary to the Architectural Publication Society, who brought out “The Dictionary of Architecture.” He served as chairman of the Board of Examiners, R.I.B.A., and was appointed a member (being chairman) of the Tribunal of Appeal under the London Building Act, 1894; to that office he was re-appointed for a term of five years from January 1, 1900, under Sections 175-6 of the Act, by the Council of the Institute. In January last year Mr. Cates founded a prize, to be awarded by the Architectural Association, for a descriptive and illustrative account of the Paris Exhibition, 1900, in the form of a Paris Exhibition travelling studentship of 20l., to a member of the Architectural Association; the prize was awarded to Mr. E. W. M. Wonnacott. He also was founder of the “Arthur Cates Prizes,” consisting of books to the value of ten guineas, for students admitted to the Final Examination. His warm and active interest in all matters relating to the professional education of architects is well known. We may here cite his

article upon “Architectural Education in the United States of America,” which appeared in Volume VI. of the Royal Institute of British Architects' Journal. In 1890 Mr. Cates was elected honorary treasurer to the Architects' Benevolent Society, an institution in which he took the warmest interest, and was re-elected in that capacity for 1895-6; in March last he was appointed a trustee of the society vice Mr. Henry Currey, deceased. In the course of the last professional year Mr. Cates was nominated by the Senate of the University of London as member of the Board of Studies for Fine Art, including architecture, as representative of the Institute; his colleagues elected him chairman of the board. On April 14, 1900, we reported a paper upon “Ancient Lights,” read by him at a special meeting of the Institute on April 9 of that year.

GENERAL BUILDING NEWS.

MALMESBURY ABBEY CHURCH.—A meeting of the Restoration Committee was held at the Town Hall, Chippenham, recently. The architect, Mr. Harold Brakspear, reported that the contractors had completed the repairs of the flying buttresses of the south side, with the exception of the double buttress at the west end, which they were unable to repair with safety until the south-east corner of the ruined aisle had been made good. As the restoration was carried out by Mr. Mark Gunning, of Holbrook, and Mr. Heming, of Wick, under the direction of Mr. Edmund Buckle, M.A., of London. The roof of the nave is completely new; the floor has been covered with concrete, and laid with wooden blocks; the old pews have been removed, and the oak of which they were made has been used as panelling round the church. The new seating has been provided by Messrs. Stephens & Bastow, of Bristol, and the church has also been furnished with a small organ from Messrs. Vowles.

REOPENING OF ABSON CHURCH, GLOUCESTERSHIRE.—The old parish Church of St. James, Abson, was reopened recently by the Bishop of Bristol after having been repaired. The work of restoration was carried out by Mr. Mark Gunning, of Holbrook, and Mr. Heming, of Wick, under the direction of Mr. Edmund Buckle, M.A., of London. The roof of the nave is completely new; the floor has been covered with concrete, and laid with wooden blocks; the old pews have been removed, and the oak of which they were made has been used as panelling round the church. The new seating has been provided by Messrs. Stephens & Bastow, of Bristol, and the church has also been furnished with a small organ from Messrs. Vowles.

IMPROVEMENTS TO PARISH CHURCH, ALFRETON.—A year or two ago it was decided to carry out certain work at the parish church. The proposal of the vicar was to lengthen and raise the height of the chancel, to build an organ-chamber on the south side of the chancel, and raise a choir vestry and a ringer's loft at the west end of the church. The scheme was estimated to cost between 1,100l. and 1,200l. Messrs. Fisher Bros., of Mansfield, were given the contract for the work, of which Mr. Hodgson Fowler, of Durham, is the architect, and it has now been completed.

NEW FISHERWICK PRESBYTERIAN CHURCH, BELFAST.—The new Fisherwick Presbyterian church was opened on the 28th ult. The new building, which has cost about 16,000l., comprises chancel, nave, transepts, aisles, organ-chamber, choir, practice-room, vestry, and committee-chambers, and a small western gallery. The style is the Early Perpendicular, and the church is apsidal. Contiguous to the choir is a chamber on the north side of the chancel for the organ. The nave is divided into five bays and transepts, having lofty stone arches resting on pillars. Each bay is furnished with tracery windows and stained glass. The western end has a small gallery, under which is the porch and principal entrances. On the north-west side are the tower and spire, rising to a height of 158 ft. The length of the nave inside is 82 ft., and the length of the chancel 30 ft. The width of the nave inside is 45 ft., and of each of the side wings 12 ft. The roof is open-timbered. There are five east windows filled with stained glass. The church has been connected by telephone with the houses of several members of the congregation who are too infirm to attend the services. In addition to the church buildings proper there is a lecture hall, with schools and catechist's residence. These are carried out in harmony with the style of the church. The stained glass was provided by Messrs. James B. Campbell & Co., and the mosaic pavement by Messrs. W. D. Henderson & Sons. The heating, which is on the Plenum system, has been carried out by Messrs. Davidson & Co., Belfast. Messrs. Wm. Coates & Sons were responsible for the electric lighting and fittings, from particulars given by Mr. W. D. Ferguson, electrical engineer. The carved oak pulpit was made by Messrs. Hurdy & Millard. Mr. Robert Corry, J. P., had charge of the building contract, and Mr. Samuel P. Close, whose designs were selected in competition, acted as architect.

BAPTIST CHURCH, EXMOUTH.—The new Baptist church, Exmouth, was opened on the 1st inst. The building, which is situated in the Victoria-road, has been erected from plans prepared by Mr. Philip Kerley, architect, of Exmouth, the builder being Mr. G. Hayman. The cost is about 1,150l. The dimensions of the oblong are about 50 ft. by 32 ft., and it has seating accommodation for 500 and choir. There are two entrance porches, a large organ-chamber, and two vestries. The rostrum is partly set in a bay-shaped recess. The whole of the floor

ing is in wood-block, whilst heating has been provided for on the hot-water system. The elevation has been carried out in limestone, with Bath-stone dressings. A large tracery window in the centre gable is a chief feature of the front. Sufficient space has been left at the back of the church buildings for the erection at a later date of schoolroom and classrooms.

RE-OPENING OF MACHEN CHURCH, MONMOUTHSHIRE.—This church was re-opened recently after restoration. The work was carried out under the direction of Mr. C. B. Fowler, of Cardiff, and has included the provision of nearly new roofs. The old ceiling has been removed, and a wooden ceiling substituted with moulded ribs. The old west desk fixed, whilst a portion of the walls was rebuilt. The plaster has been taken off the interior and exterior walls and the masonry pointed. The square tower has also been restored, and a new ringing floor provided. According to the *South Wales Daily News*, during the progress of this work several finds of interest were made. Chief of these were road loft steps and entrances, three niches, an old piscina, a west window opening, the remains of a rood screen, and a priest's doorway in the chancel.

WESLEYAN CHURCH, SUNDERLAND.—The foundation stone was laid on the 8th inst. of the Wesleyan Church and schools which are to be erected on the Holy House site, at the junction of the Durlam and Tunstall-road, Sunderland. The church will be cruciform on plan and be entered by vestibules at the junction of the two roads. At either side of the main entrance will be the staircases leading to the gallery, and there is to be a separate entrance to each transept. At the rear of the church the minister's and choir vestries will be situated, with direct access to the pulpit and choir stalls, the organ being placed in a recess behind the pulpit. The accommodation will be for 800 worshippers. The seats, pulpit, choir stalls, &c., will be in pitch pine, while the windows will be glazed throughout with cathedral lead lights. Behind the church is to be a spacious schoolroom with gallery running round, of which eight classrooms open. There will be also a large school for infants, together with numerous society classrooms, ladies' parlour, kitchens, lavatories, and cloakrooms, &c. The buildings will be faced externally with stone. The lighting throughout will be by electricity. At the left-hand side of the main entrance to the church and at the junction of the roads, will be a tower and spire, rising to a height of 100 ft. The building has been designed by and is being erected under the superintendence of Mr. J. Jameson Green, architect, of Liverpool. The builder is Mr. John Stott, of Sunderland, and the clerk of the works is Mr. W. A. Lovry, of Liverpool.

CATHOLIC CHURCH, DUMBERTON.—The foundation-stone has just been laid of the new edifice for St. Patrick's congregation, Dumberton. The building is now in course of construction, which is situated in Strathleven-place, has been designed by Messrs. Maule & Hanson, of Newcastle, and is estimated to cost 12,000*l.* and seat 1,200 people. It is in the Early English style, and is being built of red sandstone from Dumfries.

ST. PATRICK'S NEW CHURCH, BROOMFIELD, CO. MONAGHAN.—This church is now practically finished. The dedication has been fixed for September 15 next. Mr. G. L. O'Connor, Dublin, is the architect, and Mr. Wynn, Dundalk, the builder.

BAPTIST CHURCH, EAST HAM.—A Baptist church has been erected in Plasket-grove, East Ham, from designs by Mr. Edgar Stones. Messrs. Holliday & Greenwood were the builders. The cost has been about 9,000*l.*

CHURCH OF THE ASSUMPTION, ACHADOWEY, COLERAINE.—The building of this church has just been completed. The church measures 98 ft. by 32 ft., and is built of local bluestone, with dressings of Dungannon freestone. Mr. J. John O'Shea was the architect. The builders were Messrs. M'Nally & Son, Cookstown.

CONGREGATIONAL CHURCH AND SCHOOLS, WALSLEND.—The memorial stone has just been laid of a Congregational church and schools at Walslend. Mr. J. Walton Taylor, of Newcastle, is the architect.

BOARD SCHOOLS, INGWOL, YORKSHIRE.—New schools erected at Ingwolv by the Keighley School Board, at a cost of 16,000*l.*, have just been opened. The schools abut on the west on the new Queen's-road, which runs from Victoria-road to Ingwolvane. The infants' school, which is the one nearest Ingwolv Church, and is erected on the central hill principle, will accommodate 200 children, and the building is so arranged that three classrooms, giving additional accommodation for 180 children, can be erected at the south end at comparatively little outlay. The central hall here is 48 ft. by 30 ft., and the five classrooms each about 24 ft. by 22 ft. The entrance is on the ground floor. The mixed school is reached by a covered stone stairway, and here accommodation is furnished for 480 scholars. There are seven classrooms, on an average 26 ft. by 24 ft., and a central hall, 60 ft. by 30 ft. On the upper floor of the mixed school, and reached by a stone stairway from the east entrance, is a classroom for cookery, 30 ft. by 25 ft., having a large cooking

range, sinks, and provision for gas cooking-stoves, &c. There are separate entrances, cloakrooms, and lavatories for each sex; in each school there are retiring-rooms for the headmaster, headmistress, and assistants. Block flooring has been adopted almost throughout. The warming and ventilation is on the Leicester Plenum system. A tower is erected between the two schools for the fresh air supply. The whole of the ventilating and warming apparatus has been supplied and fitted up by Messrs. Ashwell & Nesbit, Limited, London. There are two large covered playgrounds, one under the mixed school, above the open playground level, for girls and infants, and one behind the mixed school for boys. At the back portion of the girls' playground is a laundry and washhouse, 40 ft. by 24 ft.; and over the boys' covered playground is a manual training room, 42 ft. by 25 ft. The area of the site, inclusive of the part reserved for the future senior school, on the west, is 12,000 square yards; and the total cost of the site and works and fencing is 16,000*l.* The following firms have been engaged upon the works:—Mr. Michael Sunderland, mason, Keighley; Messrs. Foster & Fortune, joiners, Keighley; Messrs. Hiram Emmott & Co., plasterers, Keighley; Mr. William Thornton, slater, Bingley; Mr. Samuel Rushworth, plumber, Shipley; Messrs. Holmes & Sons, painters, Steeton. The wrought-iron gates and railings are by Messrs. Longbottom Bros., Bingley; gas and cloakroom fittings by Messrs. Longfield & Co., Otley; block flooring by Mr. Roger Lowe, Farnworth; desks, &c., by Messrs. Hingwood, Ingham, & Co., Leeds. The architect was Mr. Wilson Bailey, Bradford and Keighley; and the clerk of works Mr. James Bottomley, of Haworth.

PROPOSED TOWN HALL, CHELTENHAM.—The Cheltenham Town Council having proposed to erect a town hall on land near the Winter Garden, a Local Government Board inquiry into an application for sanction to borrow 35,000*l.* for the carrying out of the scheme was held recently by Colonel Marsh, K.E. The architect is Mr. Waller. The scheme has met with considerable opposition from the townspeople, who allege that the site is unsuitable.

SCHOOL, PLYMOUTH.—The Plymouth School Board propose to erect new schools in Salisbury-road. The architect is Mr. H. J. Snell.

WORKING MEN'S HOME FOR WISHAW, NEAR EDINBURGH.—A company has been formed in Wishaw for the purpose of erecting a working men's home in the district of Craignuk. The capital is 4,000*l.* Plans will be immediately prepared by Mr. Cullen, architect, Motherwell, and the home will provide 150 beds.

SAILORS' HOME, CHATHAM.—The foundation-stone was laid recently of the Sailors' Home, adjoining St. Mary's National Schools, and close to the Town Hall, Chatham. It is intended to construct buildings covering an area of 165 ft. by 245 ft., including a central hall 100 ft. by 48 ft., billiard and retiring rooms, and some 600 cubicles. The building now in hand is only a sixth part of the whole scheme. It has a frontage of 88 ft. to the Upper Drawbridge-road, and a depth of 50 ft. It is set back 50 ft. from the road, and it will ultimately have a lawn in front and be approached by two carriage drives. The building will be constructed of stock bricks with stone and red brick dressings. It is to be four stories high, and brick drainings in the basement for a kitchen, bathrooms, pantries, scullery, beer cellar, and various stores and offices. On the ground floor there are separate rooms for petty-officers and men, with buffet and manager's offices. The first and second floors, overlooking the Drawbridge-road, will contain fifty-two cubicles, each 8 ft. by 5 ft. 6 in. The building is to be heated by hot water. The architect is Mr. G. E. Bond, and the builder Mr. H. E. Phillips, of New Brompton; the contract price being 510*l.*

SCHOOL BUILDINGS, ELY, GLANORGANSHIRE.—At a meeting of the Cardiff Board of Guardians' School Committee recently, a scheme for the extension of Ely Schools was considered. The sub-committee appointed to confer with the architect and to suggest to the committee what buildings they considered were the most suitable for and in connection with grouped homes at Ely reported that they had instructed the architect to prepare plans for the schools visiting committee. The plans were submitted and explained by the architect, Mr. Seward. They include an administrative block containing superintendent's house, office, grocery store, and sewing-room, to include clothing and drapery stores, one large cottage for twenty-four children, and four ordinary cottages for twelve children each, being accommodation for seventy-two children altogether. The architect's estimate of the cost of these buildings is 5,074*l.*, in addition to 400*l.* for draining and laying out the site, and 450*l.* for the dividing wall between the adults and children. The old hospital, which is no longer used for children, must, the committee suggested, be removed, but the new hospital will be available without any alteration.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Aberdeen Town Council has sanctioned the plans of the following new buildings:—Two dwelling-houses on the south side of Hamilton-place, for Mr. John Henderson, builder; dwelling-house on the east side of Albury-place, for Mr. Lewis Ross, per Messrs. D. & J. R. M'Millan, architects; dwelling-house on the north

side of Rubislaw Den South, for Mr. C. J. Davidson, per Messrs. W. & J. Smith & Kelly, architects; two dwelling-houses on the south side of Carlton-place, for Mr. John Rae, per Mr. William Smith, architect; workshop on the east side of Berryden-road, for the Northern Co-operative Company, Limited, per Mr. J. Wallace, joiner; stable and coach-house at the rear of No. 3, Osborne-place, for Mr. William Peters, per Mr. John Stephen, Mile End-place; alterations in connexion with Messrs. John Alexander & Co.'s additions to No. 9, Queen's-road, for Mr. Alexander Gray, per Messrs. Brown & Watt, architects; alterations and additions in connexion with premises, No. 45, Causewayend, for Mr. John Coutts, per Mr. A. Winchester, builder; two dwelling-houses on the west side of King-street, for Mr. George Godsmann, per Mr. John Cameron, architect (amended plan); additions to Walker-road Public School for the Aberdeen School Board, per Mr. J. A. O. Allan, architect (amended plan); alterations in connexion with the premises, Nos. 52-54, Union-street, for Messrs. William Walker & Sons, per Mr. John Rust, architect; additions to Migvie House, North Silver-street, for Mr. W. Kendall-Burnett, per Messrs. W. and J. Smith & Kelly, architects; alterations in connexion with offices, No. 15, Dee-street, for Messrs. Lumden & Davidson, per Messrs. W. and J. Smith & Kelly, architects; two dwelling-houses on the south side of Murray-terrace, for Mr. J. Kynoch, engineer, and Mr. George Moir, per Mr. George Sutherland, architect; shed in connexion with the Aberdeen Royal Infirmary, Woolmanhill, per Messrs. W. and J. Smith & Kelly, architects; piggeries at Ashgrove-road, for the directors of the Royal Lunatic Asylum, per Mr. George Taylor, master of works.

ALMSHOUSES, DROITWICH.—Five new almshouses in connexion with the Coventry Charity and a new infirmary were opened at Droitwich by the Countess of Coventry on the 1st inst. The new buildings are of red brick with stone facings. Mr. Lewis Sheppard, of Worcester, was the architect, and Messrs. Emuss & Harris, Droitwich, the builders.

CATHOLIC SCHOOL-CHAPEL, WORSBRO, YORKSHIRE.—A Catholic school-chapel is being erected at the corner of Henry-street, Worsbro, at an estimated cost of about 1,000*l.* It will be a brick building, having a frontage of 40 ft. to the Barnsley and Sheffield highway, and extending back along Henry-street a distance of 70 ft. The total accommodation will be for about 150 persons, the main room measuring 70 ft. by 30 ft. This will be divisible into two portions by means of a sliding partition. One portion will be used during the week as a school; the other will be exclusively set apart for church purposes. Cloakrooms, lavatories, &c., will be attached to the school premises. Connected with the chapel there will be a vestry or sacristy. Mr. J. F. Brown, of Barnsley, has been entrusted with the builders' work, and the other contracts have also been let to Barnsley firms, viz., joiners' work, Mr. G. Robinson; slating and plastering, Miss Fleming; painting, Mr. H. Cheshire; plumbing and glazing, J. Snowdon & Sons. The architect is Mr. Edward Simpson, of Bradford.

THE DICK INSTITUTE, KILMARNOCK.—The Dick Institute, erected at Elmbank, Kilmarnock—the gift of Mr. James Dick, Glasgow—for the accommodation of the Public Free Library and Museum, including the collections presented to the town by the late Mr. James Thomson, F.G.S., and Dr. Hunter Selkirk, of Braidwood, was opened on the 30th ult. The front portion of the building is two stories in height, and the return wings are one story, the frontage being 138 ft. in length, with a total depth of 114 ft. The leading feature is the portico which forms the main entrance. The pediment terminates with a figure of Minerva, with a sphinx on either side, and in the tympanum the Kilmarnock arms, with supporters. The principal entrance is by the portico and vestibule leading to an entrance-hall. To the right and left are the reading-room and library, and behind the main entrance is a lecture-hall capable of accommodating nearly 500 people. On the second floor there is a large upper hall and vestibule with dome. To the right is the north museum, which has a floor space of 1,750 sq. ft., and on the left is the south museum, with a floor area of 2,000 sq. ft. The museums are lighted both from the walls and the roof. The architect was Mr. R. S. Ingram, and the builder ex-Baillie Calderwood.

PROPOSED COUNTY COUNCIL OFFICES, NEWPORT.—Colonel Duca, R.E., held a Local Government Board inquiry at the Monmouthshire County Council offices, Newport, on the 3rd inst., with reference to an application by the County Council to borrow 10,000*l.* for the erection of a Council Chamber and an extension of the present offices at Pentonville, Newport. Mr. Tanner, the County Surveyor, was in attendance.

WORKMEN'S DWELLINGS, EBBW VALE, WALES.—The Ebbw Vale Urban District Council has decided to erect forty workmen's houses, twenty of which will be commenced as soon as a loan for the purpose has been sanctioned by the Local Government Board and negotiated. Mr. T. J. Thomas, the Council's Engineer and Surveyor, prepared three designs for the approval of his authority. On the ground floor a parlour, kitchen, scullery, and larder

are provided; on the first floor one bedroom, the entire width of the front of the house, lighted by two windows, a lesser bedroom in the main building, and another immediately over the scullery. The dimensions are:—Parlour, 11 ft. 6 in. by 9 ft. 6 in.; kitchen, 13 ft. by 11 ft. 6 in.; scullery, 9 ft. by 8 ft.; larder, 8 ft. by 4 ft.; first floor—bedrooms, 15 ft. by 9 ft. 6 in., 13 ft. by 9 ft., and 13 ft. by 8 ft. In the scullery a fireplace, boiler, and bath are shown, the latter to be supplied from the boiler when required. This part of the building, which is a wing at the rear, can be entered from the back, so that a workman can bathe and change before entering the living rooms at all. The scullery opens into the kitchen, and behind the door is the bath.

NEW BAKERY, ABERDARE CO-OPERATIVE SOCIETY.—A new bakery has been erected at the Gady's on a plot of freehold ground bought by this Society. The block of buildings is 180 ft. long by 20 ft. wide, and two floors in height. It is built of Nantmely white pressed bricks, with red Cattybrook brick dressings to the doors, windows, &c. On the ground floor is a bakery 17 ft. by 20 ft., with cooling-room 13 ft. by 20 ft., both lined with white glazed bricks, fitted up with two pairs of Messrs. Masons' double-decker ovens, dough-mixing machinery, hoist, &c., with stoking 7 ft. 6 in. in the rear. Attached to the bakery by a covered way are an office and engine-room, with one of Crossley's 8 h.p. gas-engines. The cooling-room opens out by means of sliding doors into the large coach-house 38 ft. by 20 ft. The stable block at the south-west comprises eight stalls and horsebox and harness-room. The cart-house and stable are paved with Staffordshire blue brick. On the first floor are two flour stores, each 40 ft. by 20 ft., with hoist from coach-house. Over the stable is a hay and corn loft 73 ft. by 15 ft. The premises have been built by Messrs. John Morgan & Sons, contractors, from the designs and under the supervision of Mr. I. L. Smith, architect, Aberdare, at a cost of 3,000.

SANITARY AND ENGINEERING NEWS.

HARBOUR WORKS, FINDOCHTY, BANFFSHIRE.—The harbour at Findochty is to be deepened and a pier constructed at Sterloch. The Harbour Commissioners have accepted the tender of Messrs. John Adam & Co., of Glasgow, the amount being 4,300. The work will be carried out according to plans by Mr. D. J. Reid, C.E., of Inverness.

WATERWORKS EXTENSION, ST. HELENS, LAN-CASHIRE.—A Local Government Board inquiry was held on the 10th inst. at St. Helens by Mr. H. P. Boulnois, in reference to the application by the Corporation of the Borough for permission to borrow 5,000l. for waterworks purposes. Mr. J. J. Lackland, Borough Water Engineer, explained the details of the undertaking.

FOREIGN.

FRANCE.—Five new rooms are shortly to be opened at the Louvre, for the exhibition of the tapestries, furniture, bronzes, and other objects forming the collection of the *Garde Meuble National*.—A large composition by M. Dagnan-Bouveret, representing "Apollo and the Muses," has been placed in Richelieu theatre in the New Sorbonne.—Various private art exhibitions of interest are now open. At the Durand-Ruel gallery, a collection of Breton landscapes by M. Henry Moret; landscapes by M. Guillaume at the Berthelin gallery; and at Messrs. Toth's gallery the "monotype" paintings on copper by M. Gaston Guignard.—M. Patey, the medalist, has completed his model for the medal commemorative of the founding of Marseilles. The obverse presents the ancient legend of the city, the reverse a view of Marseilles, with the date at the base, encircled by a garland.

GERMANY.—The castle of the Emperor Charles IV. at Tancergunde, is about to be restored, by command of the German Emperor; Herr Möbius, the well-known architect, has been charged by his Majesty to prepare plans for the work.—Designs are invited by Messrs. Seemann & Co., of Leipzig, for a facade to a large building; the competition is open to all architects who speak the German language, and five awards will be made. The designs have to be sent in by the 31st inst., and full particulars may be obtained from Messrs. Seemann & Co.

UNITED STATES.—The President has appointed a Commission to prepare plans for the future development of the city of Washington, composed as follows:—Mr. F. L. Olmsted, of Brooklyn, Mass., who was the architect of the park system of the city; Mr. D. H. Burnham, of Chicago, the architect-in-chief of the recent Chicago Exposition; and these two gentlemen have been authorised to nominate a third person, to act as the remaining member of the Commission.—The great waste of water in Boston is attracting considerable attention; during 1900 water to the amount of 115½ gallons was used per head per day, as compared with 111 gallons in 1899 and 103 gallons in 1898. To abate this waste the compulsory use of meters is under consideration, though much is probably due to leakage from the mains.—It is

proposed to erect a monument in Detroit in honour of General Alexander Macomb, and the design of a Washington sculptor, Mr. Amateis, has been accepted.—Considerable agitation has been made in San Francisco for some time with a view to getting the city supervisors to modify the ordinance which limits the height of fireproof buildings to 120 ft. Several builders have petitioned that the maximum height be increased to 170 ft., and that the limit for a six-story building should be raised from 80 ft. to 100 ft.—The Randolph (Virginia) County Commissioners have decided to erect a courthouse at a cost of about 75,000 dol.

The State of Washington has authorised the purchase of the county courthouse at Olympia, for use as the State capitol, and additions estimated to cost 175,000 dol. will be immediately proceeded with.—The designs for the Westmoreland County Courthouse at Greensburg, Pennsylvania, have been completed by the architect, Mr. W. Kaufmann, of Pittsburgh; the estimated cost of the building is 700,000 dol.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. Scott and Mr. H. G. Gamble, architects, of Lincoln, have entered into partnership.

THE STUDENT'S COLUMN.—Owing to pressure of other matter our "Student's Column article" ("Sanitary Fittings and Plumbing") is held over until next week.

THE SANITARY INSTITUTE.—At an examination in practical sanitary science, held in London, on April 26 and 27, twelve candidates presented themselves, and the following five candidates were awarded certificates:—F. Elgar, G. B. Grave, Kenneth Gray, Percy B. Sands, and Robert Wood.

PUBLIC CREMATORIA.—The Standing Committee of Law of the House of Commons have ordered to be reported with amendments to the House the Cremation Bill, which is in charge of Lord Monkswell and Sir W. Foster. The amendments provide that every public crematorium established by a Burial Authority shall, before it is used, be duly certified by that Authority to the Home Secretary as being complete and properly equipped; that the Secretary of State shall make regulations for the registration of cremations as well as in respect of cremation in general; and that the regulations shall be laid during forty days before both Houses of Parliament. The Bill enacts that in all cases the approval of the plans of proposed crematoria must, in the first instance, be obtained from the Local Government Board.

DERWENTWATER.—The National Trust for Places of Natural Beauty or Historical Interest appeal for contributions towards a sum of 7,000l. to enable them to acquire, on behalf of the public, a portion of the shore of the lake. The property which they seek to purchase covers 108 acres, known as Brandelhow Park, situated on the west side of the lake, below the Catbels slopes, and near Otterfield Bay towards the north. At present the shores of the lake belong to private owners, and there is no general access to them, the landing-places excepted. The proposed purchase would give the public access to about one-sixth of the west-side, and prevent the land from being taken for other purposes, or, at least, from being disfigured with sign-boards and advertisements.

STREET IMPROVEMENTS, HAMMERSMITH.—The Hammersmith Borough Council recently passed the usual statutory resolution for putting into operation Michael Angelo Taylor's Act, for carrying out a large street improvement at the eastern end of the Borough, in the vicinity of Blythe-road. The scheme provides for the acquisition of the whole of the site of the Swan laundry, so that Augustine-road may be continued into Blythe-road; for the removal of the triangular projection now existing at the point of junction of Blythe-road and Dewhurst-road; and for the widening of Blythe-road to 40 ft. on the south side, leaving a valuable area for the purpose of recon-ment.

BRITISH FIRE PREVENTION COMMITTEE.—The Executive of the British Fire Prevention Committee announce that the opening of their new testing station at Westbourne Lodge, Bayswater, which had to be postponed on account of the illness of their Chairman, Mr. Edwin O. Sachs, will now take place on Wednesday afternoon, the 22nd inst., when testing operations will be resumed and the issue of the Committee's reports, which have already reached an aggregate of sixty, will again be regularly proceeded with.

CAPITAL AND LABOUR.

YORK BRICKLAYERS' STRIKE.—Members of the York Branch of the Bricklayers' Operative Society, to the number of over 200, gave an hour's notice at eleven on Saturday morning last to the employers, and left at noon, taking their tools. The difference is one respecting working rules hitherto existing between masters and men.

PENRHYN QUARRIES.—Arrangements are being made for reopening the above and giving police protection to men who work, but it is not anticipated that more than a few hundred will resume work.

LEGAL.

THE NEW STREET FROM HOLBORN TO THE STRAND.

The case of the London County Council v. the Metropolitan Electric Supply Company, Limited, came before the Court of Appeal, composed of Lords Justices Collins and Stirling, on Thursday, the 8th inst., on the appeal of the defendant company from an order of Mr. Justice Farwell, dated April 25 last. The case was reported in the *Builder* of May 4, 1901.

The case raised a question of interpretation of a Section of the London County Council (Improvement) Act, 1899. When the Act was passed the defendant company had a generating station and works for the purpose of electric lighting in Sardinia-street, the whole of which was required to be taken by the County Council for the purposes of the new street from Holborn to the Strand. A statutory bargain was arrived at between the parties which was embodied in Section 58 of the Improvement Act. The dispute arose under Section 7, which provided in effect that the Council before the date of conveyance and lease of the new site (which the Council had to provide for the company) should pay or secure to the satisfaction of the company a sum equal to the costs of erecting and fitting-up a new generating station upon the new site with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts. The plaintiffs contended that this meant that they were only bound to provide a sum equal to the costs and expenses of erecting and fitting up a new generating station, with new plant, of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and that they were not bound to bear the expense of a new plant of a capacity to generate and supply electrical energy to an output of 5,000 kilowatts or any number more than 4,000 kilowatts, on the ground that, under unusual circumstances, a more powerful plant might be required to generate and supply 4,000 kilowatts. The defendants, on the other hand, contended that the sum claimed by them was based on the station and plant being of a capacity to generate and supply such output as a matter of practical commercial working, and that it was impossible for them to generate and supply an output of not less than a fixed amount without having in addition to the minimum plant capable of generating or supplying such an amount temporarily spare or extra plant in case of a breakdown or repairs. Mr. Justice Farwell held that the plaintiffs were right in their contention, and granted a declaration to that effect—hence the present appeal of the defendants.

Mr. Cripps, K.C., Mr. Butler, K.C., and Mr. Sargent appeared for the appellants, and Mr. Haldane, K.C., Mr. C. E. Jenkins, K.C., and Mr. Method for the respondents. At the conclusion of the arguments of counsel, Lord Justice Collins, in giving judgment, said it was obvious that in order to ascertain what sum was to be paid by the County Council, they must have a decision by competent persons on questions of fact. It was substantially agreed that the matters in dispute, and it had been thought desirable to anticipate the arbitration by taking the opinion of the learned judge as to the construction of a point of law arising upon the section in question. The short point of law which the learned judge had to decide was whether, as a matter of law, the arbitrator was to be debarred from allowing, and therefore calling upon the defendants to pay for anything more than for such engines which could fairly be graded up to 4,000 kilowatts. It seemed to him that if he were sitting as a judge bound to disengage the question of law from that of fact he should come to the conclusion that on the section in question the proper direction would be that the sum to be paid would be for such plant as would be required to generate for a reasonable period under all conditions such as might reasonably be anticipated an energy of not less than 4,000 kilowatts. Dealing simply with the matter as a matter of law that nothing, he could not lay down as a matter of law that a jury more than four machines of a capacity of 1,000 kilowatts would be required to accomplish that purpose, nor on the other hand could he lay down that anything more would be required. That would be for experts to determine, and if they said that four such engines were not competent in an ordinary commercial sense to carry out the obligation imposed upon the defendants continually supplying an output of 4,000 kilowatts, then the County Council must find the money and pay for anything more that was required. He thought that the appeal must be allowed. Lord Justice Stirling concurred and the appeal was accordingly allowed.

ACTION FOR LIEBEL BY ASPHALTERS AND TAR-PAVIORS.

The hearing of the case of Grounds and Another v. Hickman and Another concluded in the King's Bench Division on the 9th inst. before Mr. Justice Channell and a common jury, an action brought by the plaintiffs, Messrs. Grounds & Newton, a firm of asphaltes and tar-paviors, to recover from the

defendants, Messrs. Hickman & Leatherdale, the proprietors of the *Woodford Mail* and the *Winstead Mail*, damages for alleged libel.

It appeared that the plaintiffs contracted for some years to do the tar-paving and other work for the Woodford Urban District Council, and that in August, 1900, the defendants published in their two newspapers in question reports of a speech delivered by a Mr. John Knight at a meeting of the Council, and added the following paragraph: "Mr. John Knight made some very forcible criticisms on Monday evening at the Woodford Council meeting on what he fitly described as the 'slovenly manner in which the tar-paving contract work of the parish has been carried out.' He proposed that no further tar-paving be done under the present contract except such as shall be approved after view by the Highway's Committee, and his motion was carried. This is good news. Mr. Knight is an authority on paving work, and we are pleased he has soon given the parish the benefit of the open expression of his opinion that the ratepayers' money is being wasted when contracts are given to incompetent firms."

The plaintiffs' case was that these words referred to them, and were defamatory to them. The defendants denied that the paragraph in question referred to the plaintiffs, but alternatively pleaded that if it could be so construed it was fair comment on a matter of public interest. In another issue of their papers the defendants published the following: "Messrs. Grounds & Newton, the present contractors for tar-paving to the Woodford Council, having taken exception to a paragraph in the *Mail*, stating that the ratepayers' money must not be wasted on incompetent firms, we hasten to make clear to our readers that Messrs. Grounds & Newton's firm was not one of the 'incompetent firms' therein referred to. The paragraph in question was written in a general sense, and was only intended to emphasise the necessity of laying out the public money in the best possible advantage."

In the result the jury awarded the plaintiffs 25s. damages.

Judgment accordingly.

Mr. F. Dodd appeared as counsel for the plaintiffs, and Mr. M. O'Connor and Mr. Campbell Macrae for the defendants.

about 1,000*l.* as interest, and if the smaller sum, only about 400*l.* in interest. There was no suggestion that the plaintiffs were not perfectly solvent people quite able to pay the money back if the appeal of Messrs. Bemrose were successful. They were builders in a large way of business, and it was obviously a great disadvantage to them to have their money locked up in this way.

Mr. Lyttelton said that four years ago his clients tendered to Messrs. Ford 1,500*l.*

Mr. Walton: In full discharge; not on account. Now after a long argument we have got the judgment of the Divisional Court in our favour. The Divisional Court refused a stay, and I submit there is no ground for disturbing the decision of the Divisional Court.

In the result Lord Justice Collins said it seemed to him there was a substantial point of law to be argued on the appeal, and he thought that a stay of execution ought to be granted until the hearing of the appeal, on the defendants paying 2,300*l.* into court and the taxed costs to the plaintiffs' solicitor on his undertaking.

Lord Justice Stirling concurred.

EMPLOYERS' LIABILITY ACT AND THE WORKMEN'S COMPENSATION ACT.

RESULT OF PROCEEDING UNDER THE WRONG ONE.

THE case *Davies v. Nash* (reported in these columns a few weeks ago) came again before Judge Stonor on Tuesday at Marylebone County Court. Mr. T. Davies, a plasterer, Kensal-terrace, Kensal-green, was the plaintiff, and he sought, under the Employers' Liability Act, to recover damages from Mr. David Henry Nash, builder, Fernhead-road, Paddington, the claim being in respect of personal injuries sustained by the plaintiff, owing (it was contended) to negligence, for which the defendant was responsible, in the construction of a ceiling scaffold.

At the previous hearing the jury found that there was no defect in the scaffold, and that the defendant was not guilty of negligence which caused the accident. Judgment was accordingly given for the defendant, but his Honour suggested that the plaintiff might have a claim under the Workmen's Compensation Act.

Mr. A. H. D. Nonweiler, solicitor, appearing for the defendant, now intimated that on behalf of his client he consented to the plaintiff receiving 10*l.*, which was all that he could claim under the Workmen's Compensation Act. He (Mr. Nonweiler), however, applied on behalf of the defendant for costs in the action under the Employers' Liability Act. The case had been adjourned at the request of the other side, with a view to joining another before notice was given to the second builder, the latter could not be made a party to the action.

Ultimately his Honour gave judgment for the plaintiff for the 10*l.*, and allowed the defendant the costs of the previous action.

It was mentioned that the defendant's costs amounted to considerably more than the compensation awarded the applicant.

SLATE MERCHANTS AND BUILDERS.

AT the Southwark County Court, on the 8th inst., his Honour, Judge Addison, K.C., heard a remitted action, in which Messrs. Roberts, Adlard, & Co., slate merchants, of Dockhead, Bermondsey, sued Messrs. Nightingale, builders, to recover 24*l.* 5*s.* 8*d.* balance of account for slating supplied and work done. The defendants admitted the claim, but counter-claimed in regard to five items.

Mr. Bankes was counsel for the plaintiffs, and Mr. Duckworth for the defendants.

The case on the counter-claim was opened by Mr. Duckworth. He said the action was originally brought for 250*l.* odd, but his clients made a payment of 20*l.*, leaving 31*l.* 4*s.* 2*d.* On the day the writ was issued a further sum of 6*l.* 18*s.* 6*d.* was paid, thus reducing the claim to 24*l.* 5*s.* 8*d.* The defendants tendered on a bill of quantities for a contract for the baths in Lattimer-road, Wimbledon, for the Wimbledon Corporation, and they entered into a sub-contract with the plaintiffs for the roofing and the supply and fixing of some slate slabs to form slipper baths. The order was given as far back as December 28, 1899, and there was a provision that certain large thick slabs were to be supplied whole. This was found to be almost impossible, and the architect allowed the slabs to be delivered in two pieces, with a perpendicular rebated joint. There was considerable delay on the part of the plaintiffs in accepting the order for the roofing, it not being booked until March, but the defendants held that that for the slabs was entered in December.

The roofing, however, was proceeded with and was finished within reasonable time, but the slabs were not supplied and fixed until the following September and October, and the defendants contended that this was an unreasonable time to take for such work. The first item in the counter-claim was in regard to a fine edge on the rebate, for which 10*l.* 17*s.* 11*d.* was charged. The defendants contended that this fine edge was included in the price paid for the rebate, as per schedule.

Mr. J. J. Greenwood, a member of the firm of Williams & Co., slate merchants, was called by the

defendants. He said his firm would charge 3*d.* for a rebate, which would include a fine edge. The price of 2*d.* charged by the plaintiffs for the rebate ought to include a fine edge. In his opinion, three months was a reasonable period in which to carry out such slab work as in that case. Seven and a-half months was an unreasonable period to take for such work.

Cross-examined: There was a distinction between sawn edges and rebates. A rebate was not complete without it was rebated, but a sawn edge could either be rubbed or left rough, according to the order. An extra charge would be made for rubbing a sawn edge.

Mr. David, one of the plaintiff firm, said that when the defendants wrote that they would be ready shortly for the slabs, he put the matter in hand, and delivery took place soon afterwards. His firm did not delay the matter. As to the chases, it was no part of a state-mason's duty to make them. The quotation stated that a penny would be charged for rubbing exposed edges, which were edges that could easily be seen or felt. The edges of the rebates were exposed edges, and therefore came within the specification. There were three edges to the rebates, and they charged threepence.

Cross-examined: He charged only for the edges on the exposed rebates which were on the doors. The edges of the rebates where the slabs were joined had not been charged for.

The case occupied nearly a whole day, and his Honour, in giving judgment, said he had heard it because he knew from experience of the enormous expense which would have been incurred had he referred it. He would not go into the matter in detail in giving judgment, except to say that the fine edge was necessary, and the plaintiffs were justified in charging for it as they did. On the whole he gave judgment for the plaintiffs on the claim and counter-claim, with costs.

Judgment was entered accordingly.

THE ACTION AGAINST A DISTRICT COUNCIL FOR NUISANCE.

THE case of *Hawkes v. the Leyton Urban District Council* came before Mr. Justice Buckley in the Chancery Division on the 14th inst., on the application of the defendants for a modification of the order of sequestration granted against them by his lordship and confirmed by the Court of Appeal. The case was reported in the issue of the *Builder* of May 11. Mr. Justice Buckley ordered that the writ of sequestration should issue against the defendants for disobeying an injunction granted in April last year restraining the defendants, at the suit of the plaintiff, a resident at Leyton, from carrying on their works in connexion with electric lighting in such a way as to cause a nuisance by noise and vibration. On two occasions the operation of the injunction was suspended on undertakings given by the Council, on whose behalf it was stated that they were erecting steam plant which would be no nuisance. Upon appeal, the Court of Appeal confirmed the order of Mr. Justice Buckley, but limited the injunction to noise and vibration caused by gas-engines. The plaintiff afterwards applied to Mr. Justice Buckley for a writ of sequestration on the ground that the defendants had deliberately and wilfully disobeyed the order of the Court, and, as before stated, his lordship granted the application and the Court of Appeal confirmed his order, but directed that the writ should lie in the office for one week in order to give the defendants an opportunity to apply to Mr. Justice Buckley for any indulgence they might think themselves entitled to.

Mr. Henry Terrell, K.C. (with him Mr. Dibdin, K.C.) on behalf of the defendants, said that since the order of the Court of Appeal on May 8, a special meeting of the Council had been held at which all members were present with the exception of four, and a resolution was unanimously passed that the clerk should be instructed to make this application for the purpose of telling the Court that the Council were not aware until the motion for sequestration was made that there had been any breach of the order or undertaking; that it was their intention strictly to obey the order, and their desire to apologise to the Court for their disobedience. Those resolutions were proved by an affidavit of Mr. Atkins, the chairman. He (counsel) now asked that the writ of sequestration be discharged upon the defendants undertaking not to use gas engines except in the case of emergency.

Mr. Astbury, K.C. (with him Mr. A. Beckett Terrell), for the plaintiff, left the matter in the hands of the Court.

Mr. Justice Buckley said there could be no doubt that there had been by the defendants a very grave breach of the order of the Court. The order he should make would be one restraining the defendants from working gas engines at all. He imposed the term of the defendants submitting to an injunction, so that in case the order was disobeyed there would be some responsible person who could be sent to prison. He would suspend the issue of the writ of sequestration till June 17 to enable the defendants to take professional advice and be able to tell his Lordship what they proposed to do to enable them then to provide for their requirements without nuisance. If he was then

satisfied with their proposals he should be prepared to grant a further extension of time. The motion would accordingly stand over till Monday, June 17. Order accordingly.

AN ARCHITECT'S ACTION FOR FEES.

The case of *West v. Barclay* came on on the 14th inst. before Mr. Justice Kennedy, sitting without a jury, in the King's Bench Division. This was an action by the plaintiff, an architect, practising in Maddon-street, to recover from the defendant 295*l.*, the balance of fees he alleged to be due to him. The material facts were as follows.—The defendant employed the plaintiff to carry out certain improvements at Gadesby Hall, in Leicestershire, at a cost of 14,340*l.*, and the question in dispute was whether the plaintiff was to be limited to the ordinary 5 per cent. upon the total usually charged, or whether he was entitled to an extra 5 per cent. The plaintiff alleged that he was entitled, by reason of an agreement which he had entered into with the defendant to keep and pass the accounts, and to act as builder and contractor as well as architect, to an extra 5 per cent., making 10 per cent. in all. The defendant, while admitting that there was such an agreement, alleged that 5 per cent. was all that the plaintiff was entitled to.

His Lordship having heard evidence came to the conclusion that the plaintiff's claim for 10 per cent. was clearly untenable, but thought that he was entitled to something beyond the 5 per cent. scale, inasmuch as he had done more than an architect would have done under that scale. He accordingly held that the plaintiff was entitled to remuneration at the rate of 7½ per cent. on the total amount after certain items had been deducted; and in the result, on the state of accounts between the parties, gave judgment for the defendant with costs.

Mr. Reginald Brown, K.C., and Mr. Spencer Bower appeared as counsel for the plaintiff; and Mr. Reginald Bray, K.C., and Mr. H. D. Bonsey for the defendant.

RECENT PATENTS;

ABSTRACTS OF PATENTED INVENTIONS.

770.—A GAS REGULATOR: *R. Hein and T. Hahn.*—The gas flows around a valve to a floating bell which is dipped into mercury, and passes thence through pipes to the outlet. As the bell rises the valve—to the stem of which it is fixed—closes upon its seat, the overlying packing will adjust itself to the upper fixed seating of the valve in the face of which a groove is cut for that purpose, and the exit tube is provided with a regulating screw.

782.—APPARATUS FOR VENTILATORS: *W. B. Johnson.*—In an opening of the wall is fitted a frame which carries a set of curved louvers that will act as baffle-plates, the middle one being extended and pivoted at its sides so that it may serve to regulate the extent of the inlet opening, and also to separate the incoming from the outgoing currents of air.

791.—MANUFACTURE OF ARTIFICIAL STONE: *H. Schürholz.*—After the lime has been wetted in baskets it is spread over a layer of damp sand from the pit in a mixing-cylinder, and is covered with another layer of sand, superfluous moisture and both components being absorbed by the slaking of the lime; water is subsequently added to the resultant dry powder, and the blocks are then moulded and hardened.

800.—A HOLDFAST FOR PIPES: *F. Hague.*—The holdfast is devised for fastening socketed rainwater or waste pipes against the walls of buildings. Elongated and inclined slots are cut in two flat wings or lugs, which are combined with the pipe-socket.

810.—TILES FOR WALLS AND ROOFS: *W. F. Jones.*—The tiles, fashioned in the shape of a lozenge, have their lower ribs on the inside and their upper ribs on the outside, with rebated sides for interlocking purposes, together with inside ribs or ridges and nail-holes for the hanging ribs. The flowing of water beyond the joints and its suction by capillary attraction are prevented by means of grooves made in the side ribs.

818.—CHIMNEY COWLS AND TOPS: *F. Linklater.*—The inventor has devised a spiral band which, when it is mounted so as to rotate upon a vertical spindle, is provided with additional blades that it may be turned by the wind.

885.—A CONTRIVANCE FOR USE IN DRY DOCKS, AND SIMILAR PURPOSES: *R. Lewis.*—A bilge-block, which rests on the vertically-moving portion of a screw-jack, is pivoted to the framing; the lower platform is set to turn about an axle in such a manner that pressure upon the bilge-block will tend to cause the platform to turn in a direction opposite to that of the hands of a clock, the amount of pressure being indicated to the workman at the hand-wheels of the screw which lifts or lowers the movable part of the screw-jack by means of the attachment to a spring balance of the one end of a wire, whereof the other end is fastened to the platform. The position of the screw is shown with an indicator, and—in a variant shape—one hand-wheel may serve to move two bilge-blocks.

891.—LATHING OF "EXPANDED METAL": *R. G. Sykes.*—Lathing intended for fireproof buildings is

made of rolled sheets of which the V-channels or strips are bent in opposite directions; in another shape the joining-strips are twisted, and in that case all the channels are made so as to be opened outwards.

896.—A CLUTCH FOR LIFTING AND SIMILAR GEAR: *F. T. F. Conti.*—For an automatic disengagement of the clutch at a predetermined time, and (in the case of control by the governor of a Meyer expansion gear) for rendering the number of revolutions of the valve spindle a function of the extent of movement of the governor, the ascent or descent of the governor moves lengthwise a screwed socket, for each position of which will be established a corresponding position of the expansion slides of the engine; then as the spindle continues to revolve it will, by means of the socket, liberate a projection which has been engaged by the governor with a pinion. That same object will also be attained by substituting for the socket a screwed ring that encompasses a muff around the spindle, and will be moved lengthwise by the governor.

916.—AN APPLIANCE FOR WINDOWS: *E. Kiebbel.*—For opening or closing a window or hinged frame the cord is fastened to a curved pierced stay-rod pivoted on to the window, and is then passed over a pulley mounted upon a lever at the end of which is a catch which (upon release of the cord) a spring draws into engagement with the stay-rod, which a pull of the free end of the cord will again liberate. The movement of the lever is limited in extent by means of a stop formed upon the flanged bracket that carries the lever and has a fixed support.

930.—FITTINGS OF BASINS FOR LAVATORIES: *W. D. Mount.*—A bracket for lavatory basins and similar purposes consists of a front bar and two separated sides, each of which is indented at intervals in order that any length may be broken off. The sides will slide through slotted projections upon angle-irons of the corner-joints, and can be fastened with set-screws. The brackets that have no front bar, the sides consist of two parts, whereof one slides over the other.

940.—REGULATOR VALVES FOR FLUSHING MECHANISM: *F. Shanks.*—In this invention, which is adapted also for use with ships' closets, the valve is attached to the lower end of a weighted cylinder that has a slot in which slides a rod; on the end of the rod is a block through which the lever of the discharge-valve is inserted. As soon as the discharge-valve has been operated the block will impinge against the top of the cylinder and so deliver the flush as it lifts the cylinder and the valve, but the cylinder will, through gravity, sink so as to shut the valve as soon as the handle has been released. In some cases the valve may be fastened to a block which will work within a cylinder as the handle is being operated, a relieving valve being fitted in the block.

955.—FOLDING GATES: *F. Bode.*—Vertical bars pivoted to top and bottom links constitute a folding gate, which is mounted upon a post from which are projections on to which the bars are pivoted. The outer ends of bars pivoted to the top and bottom of the post are bent and provided with rollers that will engage at opposite sides in slots cut in the remotest vertical bar. They are also linked together so that when the handles moved to operate a lever the two bars will move to either open or fold up the gate; a catch retains the lever in either position. Links from the lever, that engage alternately with the bars, have projections that cause the lever to draw some of the bars inwards and to force the other bars outwards at the folding of the gate.

961.—TOOLS FOR ROAD-MAKING AND TRENCHING MACHINES: *H. Morrison.*—Bars and levers forming a parallel motion carry the square spindle upon which the tool is mounted. Since the spindle is rigid as regards the bar, the tool will remain always parallel with itself as it is lifted and depressed by the worm and sector. For removal of broken earth the tool-bolder is fitted with a digger or scoop.

969.—ROOFING TILES: *H. Wilken.*—In order that the outer surface of the roof when tiled shall present no projections, the tiles are fashioned with tongued and grooved edges that will interlock, and with bevelled lower edges that will fit into corresponding angular recesses in the tiles next below, while the lower ends of the side ribs of the tiles next above fit into recesses in the middle of the angular portions, the tiles being laid so as to break joint.

1054.—SIPHONICAL DISCHARGE: *S. Clark.*—The lifting of a valve allows the discharge to enter the longer leg of the siphon, thus starting the action. The valve-rod is joined to a pivoted lever upon the free end of which is a disc that forms the top of a bellows placed in communication with a ball. When the ball is squeezed the valve is lifted for starting the flush, as the lever is thereby forced upwards.

1063.—FLUSHING APPARATUS: *R. Pauls.*—To the float is attached the sliding piston of the stand-pipe, through openings in which, as well as through an annular groove in the piston, the supply-pipe will discharge. The supply becomes cut off with the rising of the float, and when the latter is lifted still higher with the pull the flush will escape through holes in the stand-pipe as they are left uncovered by the piston.

1118.—MANUFACTURE OF BRICKS: *T. Whittaker.*—The upper of the two plungers is mounted upon a cross piece which is vertically reciprocated with

cranks upon the shaft, whilst cams upon the shaft reciprocate a cross head which carries the lower plunger. The surplus clay is squeezed back again into the mill as the lower plunger rises after the upper plunger has been depressed into the mould and clay is filled into the mould. The pug-mill becomes automatically arrested when the lower plunger is lifted above the opening in the mould, the plungers then press the brick between them and ascend to raise it out of the mould. A cross head moves a pusher, which transfers the brick to the second mould or elsewhere, as may be required, and the pug-mill is again started with the action downwards of the lower plunger. The machine to which the improvement relates is specified in No. 7,450 of 1895.

1141.—MEANS OF AFFIXING PLASTIC MATERIALS TO WOODWORK: *S. Elliott.*—For securing plaster, cement, asphalt, and similar plastic materials the inventor has devised flattened discs composed of cement, earthenware, &c., having undercut or bevelled edges which are to be affixed to the wood-work with inclined nails, and over which the plastic coating can then be laid. The discs are described as being available instead of laths in the construction of fireproof ceilings, walls, floors, roofs, and so on.

1148.—CONDUITS FOR ELECTRICAL CONDUCTORS: *Siemens Bros. & Co., A. E. Foster, and H. F. Nott.*—The troughs or conduits have their lids thickened in the middle so as to form fitting shoulders, and they have also portions that project within them which will afford a raised support for the conductor as well as provide a spigot-joint.

1200.—A BRACKET FOR SHELVING: *B. Smith.*—A wedge having inclined teeth is tongued and grooved on to the wedge to which the angle-iron support is fastened; the support has a slot that takes the pin of the former wedge; in the end of the bookcase is a groove which receives the two wedges that become jammed together, the weight of the shelf. The bracket can be freed for its adjustment by a lifting of the toothed wedge.

MEETINGS.

FRIDAY, MAY 17.

Society of Arts (*Howard Lectures*).—Mr. Alfred C. Eborall on "Polyphase Electric Working." IV. 8 p.m.
Architectural Association. *Section.*—Mr. P. E. Newton on "A Tour in Mid-France." 7 p.m.

SATURDAY, MAY 18.

Architectural Association.—Last Spring Visit, to Chesterfield House, Mayfair (Lecture). 7.30 p.m.
Association of Municipal and County Engineers.—Oswestry meeting.
Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilization in Egypt." II. 3 p.m.
Edinburgh Architectural Association.—Visit to Pittarone House and Pittarone House and Glen.

MONDAY, MAY 20.

Royal Institute of British Architects.—Professor W. M. Flinders Petrie on "The Sources and Growth of Architecture in Egypt," illustrated by lantern slides. 8 p.m.
Institution of Junior Engineers.—Visit to the works of the Renewable Electric Lamp Company, Brunswick-place, City-road. 6 p.m.

TUESDAY, MAY 21.

Society of Arts (*Applied Art Section*).—Professor W. M. Flinders Petrie, D.C.L., on "The Rise and Development of Egyptian Art." 8 p.m.

WEDNESDAY, MAY 22.

Institution of Electrical Engineers (*Birmingham Local Section*).—Discussion on Mr. A. C. Eborall's paper, "Some Notes of Polyphase Substation Machinery." 7.30 p.m.

THURSDAY, MAY 23.

Carpenters' Hall, London Wall (*Lectures on Carpentry and Joinery*).—Mr. E. J. Barr on "Timber Houses." 7.30 p.m.
Institution of Electrical Engineers (*Dublin Section*).—Annual general meeting. Mr. W. Tallow on "The Arrangement of Accumulators in a Small Installation." 7.30 p.m.

SATURDAY, MAY 25.

Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilization in Egypt." III. 3 p.m.

SOME RECENT SALES OF PROPERTY:

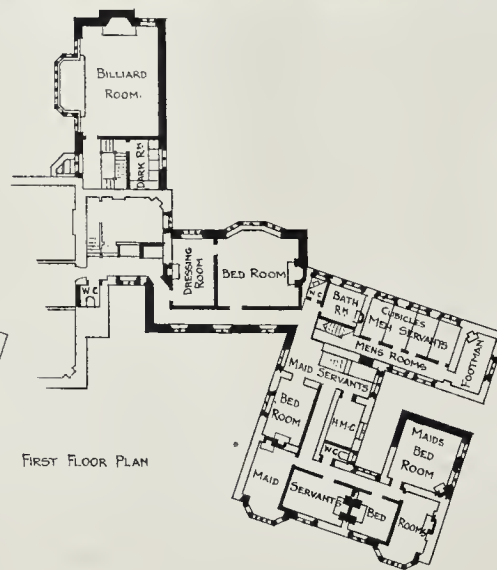
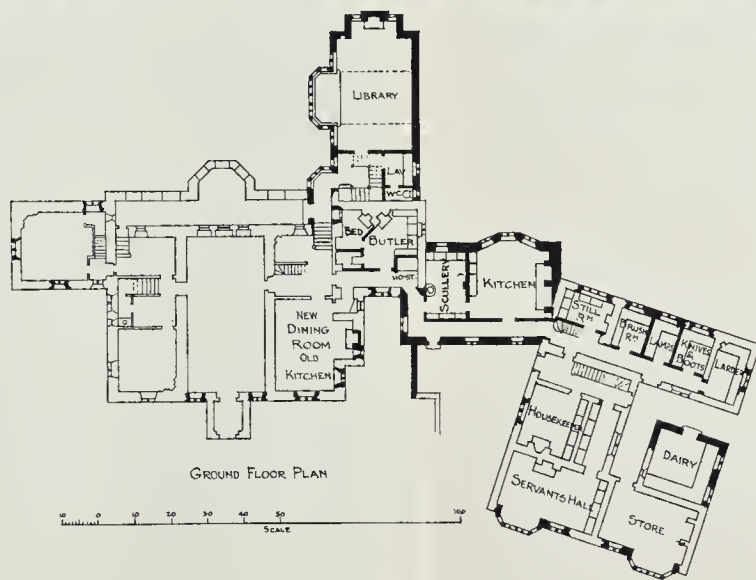
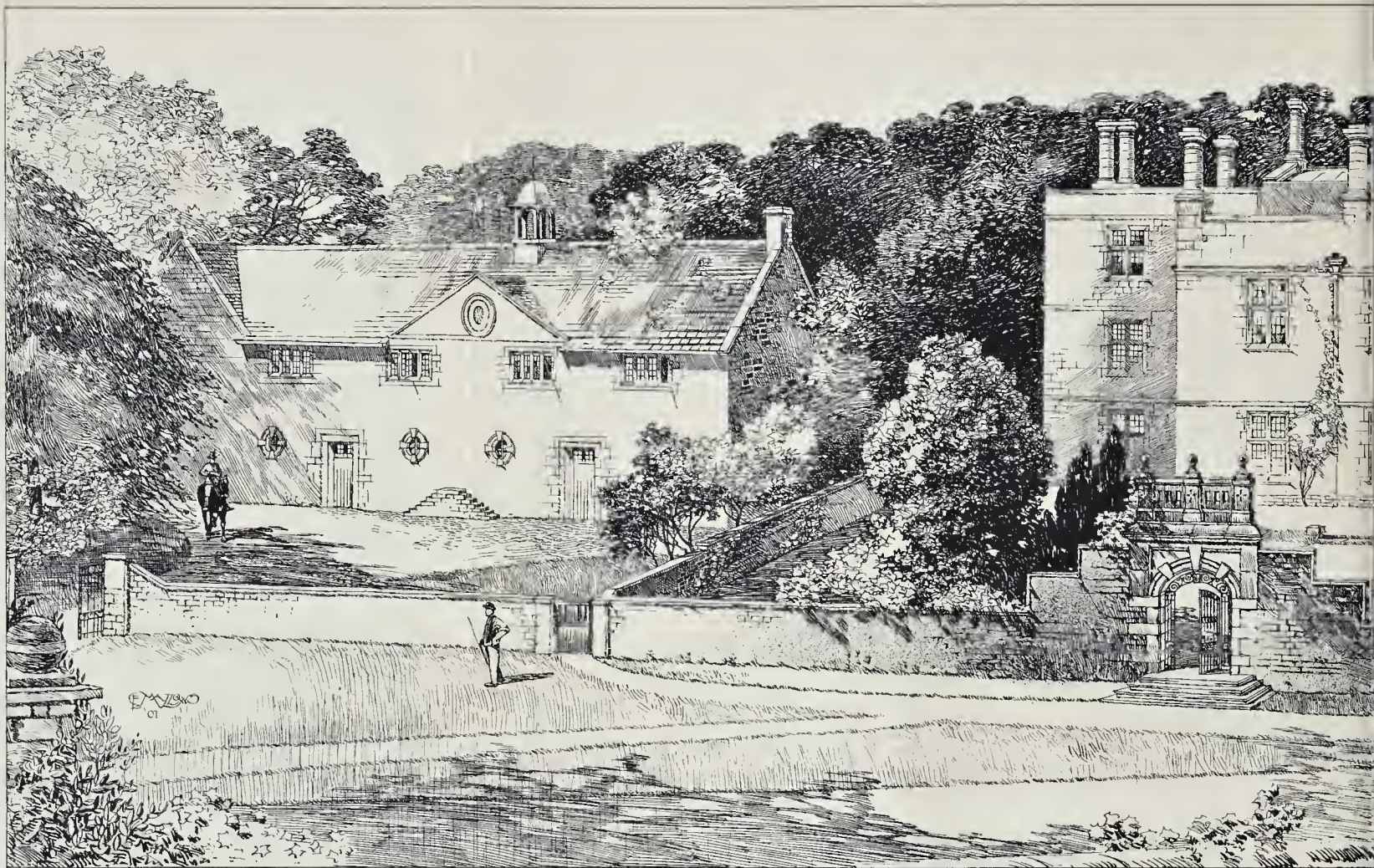
ESTATE EXCHANGE REPORT.

May 2.—By BAXTER, PAYNE & LEFER (at Bromley), Bromley, Kent.—Newman-rd., Fairlight, & 7. 594	£1,070
4. 18. 99.—By BAXTER, PAYNE & LEFER, gr. 324	1,230
May 3.—By HUSSEY & SON (at Exeter), Woodbury, Devon.—Three closes of land, 4 a. 3 r. 27 p. 6	393
Helena Villa and r. 15 p. 6	500
Four freehold cottages	510
Exton Farm, 78 a. 0 f. 28 p. 6	2,570
Upper Naval Hill House and r. 15 p. 6	2,850
Upton Pyne, Devon.—Five freehold cottages	366
By DAVID BURNETT & CO. (at Exeter), Exmouth, Devon.—Marpool-rd., Ryll-court and 10 a. 0 f. 31 p. 6	6,000
May 6.—By BAXTER, PAYNE & LEFER, Croydun.—Waddon-rd., Wadden House and 15 a. 2 r. 15 p. 6	11,200
By G. BRINSLEY & SON, Enfield.—Park-st., E. Enfield, conversion in 86 yrs.	1,310

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ALTERATION :-
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some one's large painting of Christ on the Cross; but this attempt at symbolism of position (for which the Hanging Committee are responsible) will not do; the painting is no more a Magdalen than anything else; any name would do for it. With M. Prinet's "Songe d'Automne" we are in a different region; this figure reclined in the forest on the dead leaves is a poem, and a fine one. M. Lenoir's "Eros" is worth notice for fine painting, and bright expression, also M. Zacharie's clever little picture "La Femme à l'Oiseau," a kneeling figure with her face foreshortened, and snapping her fingers at a bird fluttering about—a really pretty and original fancy, and admirable in colour. Pretty also, though much inferior to the last-named in an artistic sense, is M. Le Quesne's fancy of three nymphs decked with coins and little else, representing "La Monnaie Française." M. Henner has a small nude figure in a dark landscape, of his usual type of feeling and execution—called, oddly enough, in the earlier editions of the catalogue, "Portrait."

A fine decorative painting is exhibited by Mlle. Marie Carpentier (a pupil of M. Raphael Collin), under the title "Repos," a richly and broadly treated evening landscape with draped figures; a kind of work which one only sees in a French exhibition—no English artist seems to have the feeling for it; or is it perhaps supposed that neither the Academy nor the public in this country would appreciate such purely intellectual painting, and that therefore the effect would be thrown away? A decorative picture of another kind, and the value of which is more open to question, is M. Quost's curious work, "Panneau Decoratif," consisting of a very flat and artificial treatment of a flowering garden, making a kind of screen of what may truly be called "artificial flowers" in the foreground, while in the background are seen some grey silhouetted figures of girls in the ghost of ordinary costume. This is a State commission—we do not learn for what. It comes as near as is possible to making a picture into a mere pattern.

Among figure pictures which come nearer to life and humanity is the "L'Adieu" of M. Ridet, whose fine works in which figures of everyday life are treated in a poetic manner have been before mentioned in our columns. This consists of two ladies on a pier watching a retreating steamer, one supporting the other; the point of the work is the manner in which a realistic representation is subdued in treatment and colour so as to give a kind of imaginative glamour to it; this is not, however, quite equal to some of this painter's previous works of the same class. M. Maxence's "Le Livre aux Éillettes Rouges," half-lengths of two women with a book, is a very original and clever piece of what may be called mediævalism in painting, worth attention for its originality. Then we have of course the "moral lesson" paintings of modern life, most prominently illustrated in M. Duvent's large triptych "La Joie du Travail," of which the side scenes represent work on the recent great exhibition, and the centre an illuminated fête of the completed exhibition; highly instructive no doubt, but not very valuable from an artistic point of view. Of what may be called idyllic paintings, in which figures and landscape are combined and transfused with the same sentiment, pleasing examples are to be found in M. Lelong's "Un Soir" where

two rustic lovers are seated in front of a landscape and village bathed in evening light; and, in a more pathetic key, M. Voisard's "Coucher de Soleil," where the composition is cut across obliquely by the line of a hillside on which sits a woman in a melancholy attitude watching the setting sun. War pictures are not as numerous as usual, nor mostly very good, but there is one small work (in Gallery 23) by M. Sergent, which should by no means be passed over: "Attendant Sa Reserve". Napoléon at Marengo, still with the look and figure of a young man, seated (according to a contemporary account) on a bank at the edge of the high road holding his horse by the bridle, and looking down the road by which the reserves were to come up; one of the best and most real contributions to the pictorial illustration of Napoléon's career.

There are a good many fine portraits, of which M. Benjamin-Constant's of the Pope may be said to be the most remarkable both in execution and in expression of shrewd and penetrating character. M. Roybet's head of a coarse-looking man wearing eyeglasses is not beautiful, but one of the most forcibly painted things in the Exhibition. Among the portraits of ladies are some exceedingly fine ones; two half-lengths by M. Lauth, superb in colour and dignity; M. Gervais' queenly full length in black velvet, looking back from a window at which she stands; M. Hébert's two small and very characteristically coloured and highly finished half-lengths, in black frames which form a calculated element in the effect; M. Guinier's portrait of a lady in eighteenth century costume and holding a long wand, a picture with a texture and execution rather like pastel; and M. J. J. Lefebvre's exceedingly fine "Yvonne," a seated portrait of great dignity and beauty, and showing a bold and singularly effective line in the arrangement of the costume.

(To be concluded in our next issue.)

NOTES.

THE death of Mr. Arthur Cates removes from the architectural world of London a long-familiar figure which will be held in kindly remembrance by many both of the older and younger members of the profession. Though essentially a surveyor rather than an architect, Mr. Cates took the greatest interest in the advancement of architectural education; it was largely owing to his initiative that the Institute examinations in architecture were started; and even those who differ as to the value of these must recognise the praiseworthy motives which prompted his continued zeal in support of them. As a surveyor Mr. Cates occupied an exceptional position, and the fact of his appointment to be chairman of the Tribunal of Appeal was a notable practical testimony to the confidence felt in his knowledge and integrity. Some further particulars as to Mr. Cates' professional career will be found in our obituary column.

We have received a circular from the "Roads Improvement Association," which was incorporated in 1898 with the object of obtaining better roads in the United Kingdom. The Association now intend to bring organised pressure to bear on Parliament to amend

the existing system of administration. The points to which they specially draw attention are the amount of avoidable wear and tear of vehicles caused by the rough and uneven surfaces of the majority of roads; the increase in road traffic and the development of new methods of locomotion, and the necessity of wider and better roads both on this account and for purposes of national defence (for the movement of troops and the transport of stores). The machinery for widening existing roads is so expensive and so cumbersome that few Local Authorities can be induced to put it into operation. The conclusion of the Association is that "a general improvement can be most readily effected through a central department directly responsible to Parliament." We believe they are quite right, and that this movement should have every support from the public. What strikes one most in traversing the roads of different counties in England is the great difference between the efficiency and the maintenance of the high roads under different County Authorities. In one county we find evidence of care and attention bestowed on keeping the roads in good condition; in another county we find the roads going to pieces for want of proper maintenance. In some districts, too, high-roads which have been set out centuries ago at a width perhaps at that time adequate to the requirements, still retain the same width, now become totally insufficient. A reform is much needed, and the establishment of a central authority would probably be the best way to bring it about.

The South Metropolitan Gas Bill. The preamble of this Bill has been proved, but the transfer of the property south of the Thames, now belonging to the Gas Light and Coke Company, to the South Metropolitan Company, is not to be made until Parliament has granted the former Company power to raise further capital. Any money obtained by the sale of gas at a higher rate to Local Authorities is to be used by the Gas Light and Coke Company for the relief of the ordinary gas consumer. For three years in succession the Gas Light Company has unsuccessfully endeavoured to obtain permission from Parliament to raise more capital, and it is therefore uncertain when the transfer will be made. Meanwhile, the Gas Light Company has, we understand, decided to check its output of penny-in-the-slot meters, because the ordinary consumer is more profitable; this is a retrograde step which will naturally increase the unpopularity of this great company, and will be severely felt by the working classes.

Power Gas at 3d. per 1,000 cubic feet. In the face of strong opposition, the preamble of the Mond Gas Bill has been proved, a few unimportant conditions being attached. Under this Bill a company is to be formed which will supply Mond gas to Smethwick, Walsall, West Bromwich, Wolverhampton, and a number of neighbouring towns. The gas is to be used for purposes other than lighting, and the maximum price is to be 3d. per 1,000 cubic ft. to consumers using more than four million cubic feet per quarter, and 4d. per 1,000 cubic ft. to consumers using less than that quantity. The promoters hope to be able to supply the gas at half the charge mentioned as a maximum. The company is to have the right of refusing to supply any

consumer with less than one million cubic feet per quarter, but as the gas is used at the rate of one million cubic feet per hour at the works of Brunner, Mond, & Co., in Cheshire, it is not anticipated that any works would require less than this quantity per quarter. Mond gas burns with a non-luminous flame, and has a heating value of about one-fourth that of ordinary coal gas. It can be applied to all descriptions of gas engines, including those used for driving dynamos for electric lighting. The scheme is a bold one, and should it prove a financial success, which is somewhat doubtful, a demand will speedily be made for a supply of gas cheaper than coal gas in other large towns. In London, water gas, having half the heating power of coal gas, but double that of Mond gas, would probably be found the most suitable, especially as it can be used without difficulty, after purification, for incandescent gas lighting. The progress of the experiment will be watched with the keenest interest.*

LONDON ought to feel grateful for the memorandum from Lord Rayleigh's Committee on

the vibration caused by the Central London Railway. A short time ago there was so great an outcry from those residing or having business premises along the line, as well as from others, that it seemed probable the extension of tubular railways might receive an untimely check. In the memorandum to which we refer it is stated that the Committee is satisfied of the fact that serious vibration was felt in many houses on the course of the Central London Railway. Self-recording instruments indicated that vibration arose from the large proportion of weight of locomotives not carried by springs, and also from want of rigidity in the metals. The investigations of the Committee are not yet concluded, and when the results of further experiments are known, a more definite opinion than is at present possible is promised as to the steps that should be taken to reduce vibration on the line in question, and as to the features that should be included in new lines of a similar character. Meanwhile, it is gratifying to hear that the Committee believes that, under proper conditions, vibration can be prevented. A new form of locomotive has already been ordered from America by the railway company, and endeavours are being made to improve the permanent way, the unsatisfactory condition of which has been the subject of comment for some time past. Our opinion is that locomotives at all are a mistake, and we venture to think that this view will be fully justified by facts at no distant date.

THE recently published annual report of the Machinery Users' Association for the year ending March 31 last shows how difficult are the questions which are now constantly arising in regard to the rating of machinery. It is pointed out that at Nottingham certain machinery was rated not only on its full value, "but also on the value of certain patent rights." This is somewhat ambiguous, but we understand it to mean that this machinery, being protected by the Patent Law, was regarded as of more value than

* For further information regarding the Mond scheme see the *Builder*, February 9, 1901.

arose from its manufacturing use only. This case is likely to be heard of again in the High Court, and is obviously one of some importance. The value of combination among capitalists is also made clear when it is stated that this Association assists in appeals by manufacturers against new valuations by rating authorities. Combination is, in fact, the only way by which traders or private individuals can appeal against powerful bodies.

Storage Batteries.

MR. HIGHFIELD read a paper on "Storage Batteries Controlled by Boosters" to the Institution of Electrical Engineers last week. Although this was the concluding meeting of the session there was a large attendance, and the discussion of the paper was most spirited. Mr. Highfield suggests that electricians should utilise storage batteries much more largely than they do at present. When central stations are first started it is customary to have only a small battery of storage cells in reserve. As the load increases the engineer is tempted to work this battery beyond its capacity, and hence to ruin it. This is probably the reason why so many stations discard batteries altogether after they have been started a few years. Another reason is that the method of controlling the charge and discharge of the battery by means of regulator cells hitherto in vogue, has proved a failure in practice. Mr. Highfield's suggestion is that a dynamo with a compound-wound armature, which is called a "reversible booster," should be used to regulate the cells. His system is a most simple one, and a year's trial which he has given to it at the combined lighting and traction station at St. Helens, has proved most successful. He has obtained an efficiency of 84 per cent with his combined battery and booster. This excellent result is probably due to the fact that the booster prevents the voltage of the batteries ever falling abnormally. Mr. Trotter mentioned that he had seen the booster controlling the battery on a very intermittent traction load, and that the load on the engine was approximately constant, the battery levelling the load by absorbing and giving out energy alternately. He also mentioned that the direction of the current in the battery could be told by the hissing sound it made when charging. This proves that the battery was working at a voltage greater than two, and therefore at its highest efficiency. Engineers who are trying to find some means of saving the fuel wasted in raising steam and keeping hot long ranges of pipes when there is only a small load on the engine would do well to study Mr. Highfield's paper.

New Inn, Wych-street.

It is stated that the proprietary rights in New Inn will be purchased for 157,000*l.*, the site of the Inn being required for carrying out the London County Council's improvements on the north side of the Strand. It appears that the "Ancients" hold the property under a lease from the Middle Temple, which would not terminate until three hundred years hence, and that the sum mentioned is to be vested in representatives of the "Ancients" and the Middle Temple as trustees in that behalf. Since the destruction of Strand Inn by the Protector Some-

set, this Inn is the only law seminary that has remained in the possession of the Middle Temple Society. Some five hundred years ago the site of New Inn was that of a travellers' hostelry known as Our Lady's inn from its sign of the Virgin Mary. Of its history as a place of legal education the accounts are scanty; in King Edward IV.'s reign the guest inn was acquired at a rental of 6*l.* per annum by Sir John Fineux, Lord Chief Justice of the King's Bench, for some students of the law who were then lodging in St. George's Inn (reputedly the most ancient Inn of Chancery in London), by Sea-cole-lane, in the Little Old Bailey. To New Inn, whence Sir Thomas More when a student migrated to Lincoln's Inn, were subsequently removed the students from Strand, or Chester, Inn, which however must not be confused with the adjacent town-house or "inn" also known as Lichfield and Coventry's Inn, originally built by Walter Langton, Bishop of Chester, temp. Edward I.

New Parish Church.

WE understand that it is proposed to complete the enlargement of the parish church of St. Anne at Kew as a memorial to Queen Victoria, to add a vestry for the clergy and choir, and to renovate the west porch and portico. The original church was built of brick in 1714-15, upon a piece of ground given by Queen Anne; in 1837 it was enlarged by Sir Jeffrey Wyattville, at an expense of 4,500*l.* defrayed by King William IV. and with a grant of 200*l.* from the Incorporated Society. In July, 1884, it was re-opened, after an addition had been made at the east end, from Mr. H. Stock's plans and designs (see the illustrations in the *Builder* of December 31, 1887). The extension comprised an additional bay to the nave and aisles, a new chancel with a low circular concrete dome, carried by an octagon clearstory, and a central apse beyond, an organ chamber, and a south porch. The alterations, costing in all 5,167*l.*, and adding about 40 ft. to the length of the church, involved the re-erection, at the extreme east, of the Cambridge mausoleum with its terminal semidome. It is not commonly known that the burial of Gainsborough in the churchyard was due to his desire to be laid by the side of his friend J. Joshua Kirby, the architect and author of treatises upon perspective. E. M. Ward, R.A., restored and enrailed Gainsborough's tombstone in 1865, and placed a tablet to his memory in the church.

THE Hogarth House Preservation Committee of which Mr. G. C. Haité is chairman, and which includes among its members Mr. Walter Crane, Mr. Austin Dobson, Mr. Cosmo Monkhouse, and other well-known names, is appealing for funds to purchase Hogarth's house, and preserve it as a Hogarth Memorial and Museum. About 1,500*l.* will be required for this purpose. This is a scheme that ought to be supported; the house is an interesting example of the domestic architecture of its period, and Hogarth was too remarkable an English artist for his place of abode to be allowed to be destroyed and forgotten. Contributions can be sent to the Hon. Secretary to the Committee, Mr. Walter H. Whitear, 4, Ravenscroft-road, Chiswick.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Municipal Buildings	Hereford Corporation	100l., 75l. and 50l.	June 30

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Gasworks Extension	Mountain Ash (Glam.) U.D.C.	J. Williams, Town Hall, Mountain Ash	May 21
Street Works, Basset-street, &c., Abercrombie	do	H. P. Linton, Town Hall, Mountain Ash	do.
Sewerage Works, Poleshill	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Pipes, Junctions, Bends, &c.	do	do	do.
Flint Road Metal, near Maidenhead	Cookham R.D.C.	F. Laurens, Civil Engineer, 23, St. Luke's-close, Maidenhead	do.
Shed, Clatterbridge, Cheshire	do	do	do.
Goods Shed and Stage, Bullfield, Bolton	Wiral Guardians	C. O. Francis, Architect, 5, Richmond-street, Liverpool	do.
Houses, Dean-street, Stockbridge	L. & Y. Railway Company	E. C. Irwin, Hunt's Bank, Manchester	do.
Farmhouse, Rontowrack Farm, St. Dennis	Edinburgh Corporation	G. Gow, Fregothan Office, Fraro	do.
Farmhouse, Longburch, near Carlisle	Mr. M. Hodgson	J. Leslie, Architect, 71, Broad-street, Carlisle	do.
Cemetery Enclosure Works, near Stonehaven, N.B.	Fetteresso Parish Council	G. Gregory, jun., Architect, Stonehaven	do.
Concrete Reservoir, &c., Strichen	Decside District Committee	Jenkins & Marr, Civil Engineers, 10, Bridge-street, Aberdeen	do.
Lanney Buildings	Belfast Guardians	Young & Mackenzie, Engineers, Scottish Prov. Bldgs., Belfast	do.
Waterworks, Cast-iron Pipes, &c., near Rotherham	Swinton U.D.C.	R. Fowler, Engineer, Council Offices, Swinton	do.
Cast-iron Water Mains & Laying, Wimsington, Cheshire	do	John Moreton, Moss Farm, Northwich	May 22
Villa, Tintagel, Cornwall	Balrothery (Ireland) R.D.C.	Captain J. Brown, Tintagel	do.
Cottages and Offices	Mr. Jas. Gliver	A. Scott, Civil Engineer, 19, William-street, Drogheda	do.
Farmstead, &c., Carlbees, near Consett	Cuckfield U.D.C.	G. T. Wilson, Architect, 121, Durham-road, Blackhill	do.
Granite Road Metal, Hayward's Heath	Mr. W. G. Wilton	T. Simmonds, Surveyor, Cuckfield	do.
Business Premises, Fore-street, Redruth	do	do	do.
Pair of Houses, Hipperholme, Yorks.	Lindfield (Sussex) School Board	S. Hill, Architect, Green-lane, Redruth	May 23
Additions to Schools	do	E. Waugh, Bolton-road, Hayward's Heath	do.
Vestry, St. Augustine's Church, Selasget, Yorks.	Cirencester U.D.C.	Kirk & Sons, Architects, Huddersfield	do.
Additions to British School, Sedbergh, Yorks.	do	R. Walker, Architect, Windernere	do.
Borholo, &c.	Thurston School Board	E. Jones, Architect, Surveyor, Council Offices, Cirencester	do.
Seven Houses, Treadley, Rhondda, Glam.	Aylesbury U.D.C.	E. W. Dyson, Civil Engineer, Horwich	May 24
Two Schools and House, Hazlehead, &c., nr. Sheffield	Barrow Co-op. Society, Limited	J. H. Bradford, Surveyor, Town Hall, Aylesbury	do.
Public Convenience, near Town Hall	do	W. H. Bristow, Architect, Cornwall-street, Barrow	do.
Three Shops, Vickerstown, Walsley	Mr. J. McNeil	Kirk & Sons, Architects, Dewsbury	do.
Farm Buildings, Cuththorns Farm, near Burnopfield	Llangollen U.D.C.	W. G. Scott & Co., Architects, Workington	do.
Parsonage, Dewsbury Moor	do	S. Coates, Frenchgate, Richmond, Yorks	do.
Three Houses, Harrington, Cumberland	Wivenhoe (Essex) U.D.C.	E. F. Jones, Llangollen	do.
Houses, Dundas-street, Richmond	do	Sands & Walker, Engineers, Angel-row, Nottingham	do.
Sheds, &c., Smithfield	Lexden & Winstree R.D.C.	E. F. Hooper, Architect, 6, Union-road, Exeter	do.
Fire Station	Wallsall Corporation	J. Bunals, Surveyor, Architects, Lord-street Chambers, Halifax	May 25
Water Supply Works	do	J. R. Cooper, Borough Offices, Walsall	do.
Two Cottages, Cocktree Estate, Northtawton	St. Annes-on-Sea U.D.C.	J. W. Jones, Architect, Gwily House, Llandilo	do.
Five Houses, West Vale, Halifax	Salisbury U.S.A.	Rev. P. Cantwell, Parochial House, Killybeg, co. Westmeath	do.
Road Metal	do	T. Bradley, Council Offices, St. Annes-on-Sea	do.
Surveyor's Materials	St. Helens Colliery Co., Ltd.	A. C. Bothams, Civil Engineer, Municipal Offices, Salisbury	do.
Chapel, Llanlunan, Llandeibie	Bournemouth Town Council	do	do.
Warehouse and Stores, East Parade, Horsham	Towbridge, &c., Guardians	J. S. Moffat, Architect, 63, Church-street, Whitehaven	do.
Restoration Works at Parish Church, Killucan, Ireland	Edinburgh Gas Commissioners	F. W. Lacey, Engineer, Municipal Offices, Bournemouth	do.
Fire Station, House, &c.	Uttoxeter R.D.C.	W. W. Snailum, Architect, Towbridge	do.
Chimney Shaft	Epsom R.D.C.	W. R. Herring, Engineer, Gasworks, New-street, Edinburgh	do.
Refuse Destructor Buildings	Norham U.D.C.	J. Preston, Surveyor, Woodlands, Uttoxeter	do.
Twenty-nine Houses, Siddick, Cumberland	Thame U.D.C.	See Advertisement	do.
Bridge, West Cliff	do	Engineer, Public Offices, Dyne-road, Kibbure, N.W.	May 28
Additions to Workhouse Infirmary, Sevington	Tyne Steam Shipping Co., Ltd	W. G. Champion, Surveyor, Council Offices, Northam	do.
Cast-iron Main Pipes, &c., Granton	Paignton (Devon) U.D.C.	W. G. Morgan, 10, Edwards-terrace, Bedford	do.
Footbridges, near Abbots Bromley, Staffs.	Coedfranc School Board	See Advertisement	do.
Water Pipes, &c.	do	Hope & Maxwell, Architects, Trinity-buildings, Newcastle	May 29
Road Making and Paving Works	Kingstown (Ireland) U.D.C.	F. W. Vanstone, Engineer, Paignton	do.
Concrete Wall, near Appledore, Bideford	West Hartlepool School Board	J. C. Rees, Architect, Neath	do.
Twenty-five Houses, Bedllog, Wales	Bromley Guardians	J. J. Green, Architect, 19, South John-street, Liverpool	May 30
Broken Granite	Kingston Guardians	School Board Offices, Park-road, West Hartlepool	do.
Workshops, Glasshouse Bridge, Newcastle	do	J. Ladds, Architect, 7, Doughty-street, W.C.	June 1
Water Supply Works, New Moorland	Bermondsey Borough Council	W. H. Hope, Hampton Wick	do.
Schools, Skewen	Gloucester School Board	Borough Surveyor, Town Hall, Spa-road, S.E.	June 3
Electricity Station	Billerica R.D.C.	H. H. Melland, Architect, 15, Clarence-street, Gloucester	do.
*School Buildings	Harrowgate Corporation	Bailey Denton, Son, & Lawford, 9, Bridge-street, Westminster	do.
*Mortuary	Malden U.D.C.	R. J. Beale, Architect, 3, The Broadway, Westminster	do.
*Boilers (2)	Camberwell Guardians	K. Bunting, Surveyor, Fair Meadow, Maidstone	June 4
*York Flags, Granite, &c.	N. E. Railway Company	A. E. Mullins, Architect, 16, Church-street, Camberwell, S.E.	do.
Schools, Linden-road	Rochford R.D.C.	Baldwin Latton, Parliament Mansions, Victoria-street, S.W.	June 5
*Kursaal	Shardlow Hospital Committee	W. J. Cudworth, Engineer, York	do.
Guernsey Granite, &c.	Loughborough (Leics.) Corporation	J. Mansergh, Engineer, 5, Victoria-street, Newcastle	do.
Rail Station	Halifax School Board	F. S. Andiff, Architect, Draycott	June 10
*Conduits, Drains, &c., Park-street, Hull	do	H. W. Walker, Architect, 19, South John-street, Ipswich	June 12
Coal Depots, &c., Park-street, Hull	Mr. R. Lowenhaupt	A. H. Walker, Civil Engineer, Town Offices, Loughborough	No date
*Water Tower, &c.	do	D. W. Booth, Architect, Hopwood-lane, Loughborough	do.
Hospital	do	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
New Road, Westerfield-road Estate, Ipswich	do	Mr. Gunner, Knapbill, Woking	do.
Broken Granite, &c.	do	Openshaw & Gill, Architects, 6, Fleet-street, Bury	do.
Schools, Copley	do	H. H. Dunstall, Architect, 9, New-road-arcade, Chatham	do.
Five Houses, Bothwell-road, Halifax	do	Town Clerk, Town Hall, Dumbarton	do.
Three Pairs of Villas, Knapbill, Woking	do	E. Dodd, 37A, Waterloo-street, Birmingham	do.
Pair semi-detached Houses, Arnold-pk., Manchester	do	Mr. Wilkinon, Civil Engineer, Town Offices, Westmeath	do.
Laundry Buildings, Boster's-hill, Chatham	do	F. Armet, Architect, 173, Ellenmore-road, Sheffield	do.
Building Work, Parish Church, Dumbarton	do	Garside & Pennington, Architects, Pontefract	do.
New Roads, sewers, &c., Birmingham	do	See Advertisement	do.
Drainage Works, &c., Cemetery, Padham	Lambeth Hayes Charity Trustees	do	do.
Three Houses, Grimethorpe-road, Sheffield	do	do	do.
Lodge, &c., Welburn Hall, Kirbymoorside	do	do	do.
*Artizan Dwellings	do	do	do.

[See also next page.

PUBLIC APPOINTMENTS.

Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, Application to be in. Lists various roles like Assistant Building Inspector, Junior Civil Engineering Assistant, etc.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxiii.

PRICES CURRENT (Continued).

WOOD.

Table listing wood prices: Vainscot Oak Logs, Wainscot Oak, Mahogany, Honduras, Tabasco, etc. Columns include price per standard and price per load.

JOISTS, GIRDERS, &c.

Table listing prices for steel joists and girders, including ordinary sections, compound girders, and various types of plates.

METALS.

Table listing prices for various metals: Common Bars, Staffordshire Crow Bars, Staffordshire Marked Bars, Mild Steel Bars, Hoop Iron, Sheet Iron, Galvanised Bar, Galvanised Corrugated Sheets, etc.

PRICES CURRENT (Continued).

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English sheet glass in crates, including 15 oz. thirds, 24. fourths, 26 oz. thirds, etc.

OILS, &c.

Table listing prices for oils: Raw Linseed Oil, Best Hard Copal Varnish, Best Hard Carriage Varnish, etc.

VARNISHES, &c.

Table listing prices for various varnishes: Fine Elastic Copal Varnish, Best Elastic Copal Varnish, Best Elastic Carriage Varnish, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted. ABERDEEN.—For the execution of works at Kingsseat Asylum. Mr. Mackenzie, architect, 343, Union-street, Aberdeen.

BLAENCLYDACH (Rhonda).—For the erection of proposed new hotel, to be called Park Hotel, at Blaencllydach, Rhonda, Glam., for Mr. John Phillips. Messrs. Griffiths & Jones, architects and surveyors, Tonypanddy, and Glynbonddastreit, Cardiff.

BRIDLINGTON.—For additions, &c., to Nos. 4 and 5, Prospect-street, for Mr. E. C. Dixon. Mr. J. Earnshaw, architect, Carlton House, Bridlington.

CASTLEFORD.—For the erection of school buildings, Pontefract-road, for the Primitive Methodist Trustees, Castleford, Yorkshire. Mr. R. M. McDowall, architect, Carlton-street, Castleford.

Excavating, Draining, and Concreting. J. L. Rodger, Albion-street, Castleford* .. £60 3 0. Bricklaying and Masonry. T. Thompson, Smawthorn-gve., Castleford* 397 0 0. Carpentry and Joinery. R. Gillatt, Perseverance-street, Castleford* 185 0 0. Slating. S. Evison, Pontefract-road, Castleford* .. 43 10 0. Plumbing and Glazing. Wilson & Son, Eastfield Works, Castleford* 133 14 6. Plastering. Jas. Lockwood, Wilson-street, Castleford* 27 0 0. Painting. W. Lawrence, Amber-street, Castleford* .. 16 8 0. Total..... £871 15 6. [Architect's estimate, £890.]

CLEVEDON (Somerset).—For the construction of a new road at Clevedon. Mr. T. Moss Flower, A.M.Inst.C.E., 28, Baldwin-street, Bristol:— J. Woolford .. £482 4 6 | T. Hill .. £330 0 0 | W. A. Green .. 437 0 0 | J. Coles, Walton, Rowell & Sons .. 422 5 0 | Clevedon* .. 292 8 0 | E. Monks .. 413 0 0 |

EASTBOURNE.—For the erection of fifteen transformer chambers, for the Corporation. Mr. J. K. Brydges, C.E., Electricity Works, Eastbourne:—

Six Large Chambers. Cast-iron. John Every, Lewes .. £519 6 6 (Accepted + £35 for erecting on foundations provided by Corporation.) Beck & Co., London .. 61: 3 0. Brick. Kemp & Sons, Hove .. 1,380 0 0. Tappner & Co., Hastings .. 1,266 0 0. Nine Small Chambers. Cast-iron. John Every, Lewes .. 133 10 0. Brick. Tappner & Co., Hastings .. 121 0 0. (Neither accepted. To be constructed by Corporation. C.I. pavement frames and covers for these from John Every for £26 15s. 9d. accepted.)

ELLAND (Yorks).—For the erection of public baths, South House estate, for the Urban District Council. Mr. G. Hepworth, architect, 20, Bradford-road, Brighouse. Quantities by the architect:—

Masonry.—J. & R. A. Crawshaw, Ripponden .. £2,070 0 0. Carpentry and Joinery.—Crowther Bros., Elland .. 838 18. Concreting.—Greenwood & Sons, Halifax .. 436 5. Plastering.—Hutchinson & Sons, Elland* .. 45 16. Structural Steelwork.—Hitchin & Son, Halifax* .. 285 0. Slating.—James Smithies, Brighouse* .. 95 10. Painting.—Hutchinson & Son, Elland* .. 68 0. Heating and Engineering.—Fawley & Son, Halifax* .. 524 0. Plumbing and Glazing.—Fred Ogden, Brighouse* .. 205 0. £4,769 9.

FARNWORTH (Lancs).—For the erection of Reform Club buildings, Peel-street. Mr. J. H. Taylor, architect, 15, Grove-street, Kearsley, Farnworth. Quantities by architect:— W. Myatt .. £2,123. W. Myatt .. £2,045. J. Kayley .. 2,100. J. B. & J. Entwisle, Coope Brothers .. 2,057. Kearsley* .. 2,350. [See also next page.]

GREAT GRIMSBY.—For the erection of school⁵ Harold-street, New Cleve, for the School Board. Mr. H. C. Scapling, architect, Court-chambers, Grimsby. Quantities by Mr. J. Watson, Hull:—
 Pattinson & Sons .. £24,845 | Gilbert & Kirton .. £18,650
 Alex. Sims .. 20,300 | Thompson & Sons, Grimsby* .. 18,200
 Hewins & Goodhand .. 19,854

KIRKCALDY (N.B.).—For the erection of new police buildings, court-room, &c. Messrs. Williamson & Inglis, architects, Kirkcaldy. Quantities by Mr. Geo. Morham, Edinburgh:—
 Masonry.—T. & Y. Menzies, Kirkcaldy* £12,188 0 0
 Smith's Work.—J. Mundy, Glasgow* 1,402 0 0
 Joinery.—M. Wishart, Kirkcaldy* 3,398 0 0
 Plumbing.—Knox & Sons, Edinburgh* 1,091 0 0
 Slating.—Currie & Cant, Kirkcaldy .. 337 16 0
 Plastering.—W. Grant, Kirkcaldy .. 788 0 0
 Glazing.—Dickson & Walker, Edinburgh* 168 2 8
 Painting.—John Carruth, Glasgow* .. 262 11 6
 £19,633 10 2

LONDON.—For restoring damage caused by fire at No. 12, Crane-court, Fleet-street, E.C., for Messrs. James Sears & Sons. Mr. Alfred E. Nightingale, architect, Albert Embankment, S.E. 7:—
 Lidstone & Son .. £581 0 | W. J. Young .. £398 0
 Marsland & Son .. 575 0 | Barber & Son* .. 394 10

LONDON.—For extension of offices, for the Star Life Assurance Society, 39, Moorgate-street. Mr. Arthur Blomfield Jackson, architect, 26, Mecklenburgh-square, W.C.:—
 Holland & Hannen .. £12,350 0 0 | Patman & Fothering-ham* .. £10,693 6 10
 Colls & Sons .. 11,934 0 0
 E. Edwards .. 11,933 0 0
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The Builder.

VOL. LXXX.—No. 3942.

MAY 25, 1901.

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Rimini Cathedral: Part of South Side, Detail of Chapel	Double-Page Ink Photo.
Church of St. John, High Wycombe.—Mr. W. D. Caroe, F.R.I.B.A., Architect	Double-Page Ink Photo.
Doorway, Church of the Miracoli, Venice	Single-Page Photo-Litho.
View of S. Maria Della Salute, Venice	Single-Page Photo-Litho.

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Ornamental Fixtures.



I have not conducted to the understanding of the law, in regard to the respective rights of landlord and tenant, or of tenant for life and remainder-man, as to things attached to the freehold, that the title "fixtures" has been given to things that are removable. At first sight the word would seem to imply that it was meant to cover things which must remain fast to a building or to the ground, whereas it is exactly the contrary. The old rule of law was very rigid: whatever was attached to the ground and in that sense to a building, became part of it, and so became the property of the freeholder. But that rule has, under the influence of modern changes, been gradually relaxed, and there are now two great exceptions to it—what are called trade fixtures and ornamental fixtures. We are not now concerned with the former class. The second is, having regard to modern decoration, more and more important, and it includes articles which are becoming and suitable "for the more convenient or luxurious occupation of houses." The way in which the law has grown more elastic on the subject is well exemplified by the statement of the fact that in 1705 it was judicially decided that "pictures and glasses put up instead of wainscot, or where otherwise wainscot would have been put, shall go to the heir and not the executor"—in other words, were not removable by a tenant. No one would now for a moment contend that pictures and pier glasses, however firmly fixed to a wall, became the property of the freeholder. But since the decision of the Court of Appeal in the now celebrated Luton Hoo tapestry case, it is clear that, in order to say if a thing is an ornamental fixture, there is nothing more to be done than to consider in the first place if the thing is for the con-

venience or the ornamentation of a house. The amount of firmness with which it is fixed to a wall becomes immaterial if the thing is originally a separate article, intended for use by itself. Of course the method of fixing must be carefully considered, in order to be sure that the article is such a separate thing. "There might be such an incorporation of the chattel with the freehold that it would be impossible to deny that the chattel had become part of the freehold, and absolutely impossible to admit the exception. Therefore the quantum of fixture is important. One must ask oneself, is there any more fixing than was necessary for the enjoyment of the chattel as such? If you fix a heavy object, such as a heavy ormolu clock, to the wall of a room, you may, in order to make it safe, have to use very substantial fixings. You may have to drive an iron bar right through the walls to rivet it at the back. You might have to employ a mode of fixing which in many cases would be conclusive of an incorporation of the chattel into the freehold. But the moment you come to the conclusion that the mode of fixing which was employed was absolutely necessary for the enjoyment of the chattel the inference does not arise."

These views of Lord Justice Vaughan Williams will, we think, enable any person, be he architect or builder, to understand the question without difficulty. In the first instance, however, one must consider what the article is which is so affixed; but, as already stated, any ornamental object which is complete in itself, seems to be such an ornamental fixture as belongs to a tenant. "If," said Lord Justice Rigby, "the exception applies to such a thing as a chimney-glass, I cannot see why it does not apply generally to all articles affixed for the purpose of enjoyment and ornamentation." This dictum is very broad, and it serves to make the Luton Hoo case one which is a kind of Magna Charta for the tenant, in regard, at any rate, to ornamental fixtures. The effect of the decision is most important and far-reaching, because it should

be noted that, on two previous occasions, tapestries have been held to belong to the house. In one case—Norton v. Dashwood, decided in 1896—the tapestries had for a hundred years belonged to and formed part of the decoration of a mansion house. It is, clear, however, that were a similar case to arise again—with the special circumstances which characterised it—the decision would be different. A still earlier decision by Lord Romilly was distinctly declared to be erroneous. This fact shows how wide is the present judgment, more especially when it is borne in mind that Lord Justice Rigby stated that no doubt these tapestries "were affixed in such a way as, in earlier days, would have been held to make them inseparable parts of the wall." In other words, the modern judicial view of this question is quite different, quite opposed to that of half a century ago.


Certain articles have, by usage and legal decisions, become clearly defined as among those which can be removed by a tenant, however firmly they are affixed to a building. But the recent development of the law has given so wide a definition to the words "ornamental fixtures," that practically everything which is not intended to become a permanent and integral part of a building may be removed by a tenant either for years or for life. Thus a much greater latitude is given to expenditure by those who are not the permanent owners of a building, and it may be said that under the present condition of the law a tenancy is more desirable than was formerly the case.

The words with which Lord Justice Rigby concluded his judgment are, in fact, sufficient to give a tenant for years or for life, or the executor of either, or their advisers, perfect freedom of action. The case, said the Judge, "falls within the proposition that articles set up for the purpose of decoration or ornamentation are excepted from the rule that things fixed to the freehold belong to the owner of the freehold." Care, of course—as he had pointed out—must be exercised in the consideration of the word "articles," but subject to this proviso,

nothing can be broader than the above proposition.

A small but practical point of some importance was also decided in the Luton Hoo case, viz., that though the tenant should pay for any damage done to the walls by taking down his fixtures, he has not to pay for re-decorating the room. "It is not," said the Court, "waste to remove one set of purely decorative ornaments to make room for another." We understand that to mean that a tenant for life or a tenant for years—when there is no term to the contrary in his agreement—may, for example, take off a wall paper, substitute tapestry, and if he likes remove it and leave the wall without either tapestry or paper.

FRENCH ART IN 1901.*

andscape-painting there are still things to be seen at the Salon which make all English landscape painting of the day seem tame. M. Didier-Pouget's two works hang in the great gallery; the largest, "Ajones et Bruyères, Village du Pin," is quite astonishing in its power in the foreground, and very fine in the distance, but this remarkable painter is getting too much into the habit of repeating his main effects—a hill and shrub foreground which looks as if you could walk on it, a misty valley in the middle distance, a sun-lighted plateau beyond; the materials of a most effective scene, but they have been repeated two or three times in a manner that makes one suspect that the painter puts into the scene what he wants rather than merely what is there. M. Quignon, who at his best is (or was) a painter of a broader and finer style than his rival, has only two small landscapes this year, not showing anything like his best powers. M. Simonnet is in danger, in his "Coucher de Soleil," of a little overdoing his rich and solemn effects of woods and sunset light. But the two landscapes of the year are those of M. Harpignies, both scenes in which glimpses of distance are seen through a foreground of forest trees. The whole history of landscape-painting can hardly show a style equal to that of this great artist; he possesses the finest qualities of Constable with a certain refinement of execution added to them; the foliage of the trees is so freely handled that it seems really to grow rather than to be painted. A fine picture by M. Calvé, "La Lagune d'Ous," is a good example of a type of landscape in which French painters excel, and which consists in making a picture out of the simplest and most unpromising materials—in this case a pond in the middle of a waste moor with low hills in the background; but it is a picture, most complete in its way. French landscape painters undoubtedly gain something by the large scale on which many of them paint, and which, as in this case, gives more scope for effect than a smaller canvas; but the more confined spaces of the Royal Academy would not admit of this in England, even if our artists wished to paint landscape on a larger scale. There are, however, a good many smaller landscapes, more than can be mentioned here, of very fine quality for breadth of style and power of atmospheric effect; among

these smaller ones an English painter, Mr. Alfred East, takes an exceedingly good place with his "L'Etang Mystérieux," a better picture than any that he has in London; he was quite right, however, to send it to Paris, where its style will be much better appreciated. Another English painter, Mr. R. W. Allan, has the honour of a place in the great gallery, where his "Une Porte de la Mer" looks certainly a great deal smaller than it did in the Dudley Gallery, but has its effect nevertheless. Seapieces as usual are bad; M. Palézieux, in "Après la Tempête," endeavours to impress us by vast size, but it will not do; his waves are none the better for being big.

The New Salon strikes us as being really on its last legs. Of course the death of Puvis de Chavannes was a terrible loss to it; and their chief support next to him, though in such a very different way, M. Carolus-Duran, exhibits only one portrait, and that not quite of his best, though certainly a fine one. Besides that, he contributes only landscapes; and though it is interesting to see how an artist, whom we know chiefly as a fashionable portrait-painter, treats landscapes, it cannot be pretended that M. Carolus-Duran takes an important place as a landscape-painter. He would serve the New Salon better by sending them the class of picture for which he is famous, and not his experiments in another walk of art. The death of Cazin, who really was a fine landscape painter, is another serious loss; and other painters who have usually been among the most original contributors—MM. La Touche and Carrière in figure subjects, and M. Courten in landscape, are also not at their best. It is true that there are a good many small and unpretending pictures, landscapes and others, which are pleasing and which would be almost crushed in the other exhibition, but the difference is that the Old Salon contains a good many really fine and important pictures, and the New Salon contains none; there is not a work of the first order of interest to be found there; and even the pretence at greater refinement than the Old Salon must now be abandoned, for the management have evidently been obliged to take what they could to fill their walls, and there are things more vulgar and more artistically coarse than anything to be found in the Old Salon—which is saying a great deal. In fact, year by year it becomes more evident that this split in the camp is an artistic mistake, and that the two societies had much better join hands and only try to fill one suite of galleries, since it is obvious that they cannot fill two in a satisfactory manner.

The glory of the New Salon, we presume, consists in retaining possession of M. Rodin, the sculptor whom the esthetic public now gape after with such an exaggerated adulation. He exhibits a nude statue of Victor Hugo, or rather, half a nude statue, as the whole of the right side below the waist, and the right leg, is left unfinished, *en bloc*, for M. Rodin cannot condescend to finish anything now; it is honour enough for the public to be permitted to see his unfinished works, with a head or a limb sticking out of a mass of rough marble. The head in this case is fine, but that is no excuse for this absurd pretence that works in sculpture are better unfinished; the whole proceeding is merely playing upon the folly of the public.

The sculpture generally at the New Salon is not very important, but there is an effective monumental statue of Daudet by M. Saint-Marceaux, who puts an apologetic parenthesis into the catalogue to the effect that it is "unfinished," which might have been more reasonably applied to the Victor Hugo work, which is much more unfinished.

Sculpture at the Old Salon shows the usual tremendous crowd of works, and the usual (of late years) proportion of things which seem to aim at compelling public notice by sensational attitudes and sensational subjects totally alien from the true genius and the proper ends of the art of sculpture. From this crowd, nevertheless, are to be picked out many good and some beautiful works. Thus, M. Vital-Cornu's female figure, "La Nature s'éveille," is one of the most perfect and perfectly-modelled figures it would be possible to see; from whatever point of view you take it, it is fine. M. J. Boucher repeats in marble his fine and poetic conception shown in plaster in a former Salon, "Antique et Moderne," one of the most intellectual productions of recent sculpture.* M. Cordonnier's "Sainte Famille," a group in grey marble, is a fine piece of religious art. M. Gasq's monument to a bishop, who kneels on a sarcophagus beside which is a draped figure representing "Amenitas," is admirable in itself, but the merit of the accompanying figure and its admirably designed drapery is really due to Chapu, from whom it is a palpable imitation. M. Gaudissard's "La Vie de la Maison" is an interesting bas-relief for the decoration of a private house, consisting of figures symbolising the occupations of various hours—reading, music, needlework, meals, sleep, &c.; the names are not appended, but the design tells its own story. Among portrait statues M. Gérôme has a gilt equestrian statuette of "Washington," not particularly remarkable except in being his work; Mr. Goscombe John a colossal statue called in the catalogue "Portrait du lord duc Devonshire," an effective work of its kind (it is catalogued, by the way, under the name of "Goscombe" instead of "John"); M. Jean Hugues a seated statue of Pasteur; and M. Marqueste another of Victor Hugo, of which one must confess that the head looks rather prosaic in comparison with M. Rodin's head, but presumably this is really a likeness, and the other is M. Rodin's impression of what Victor Hugo ought to have looked like. Among monuments a fine and important one is that to Jean Macé, by M. Massoule. We presume M. Macé did something for juvenile education; the monument consists of a large stele crowned by a female figure holding high aloft an open book; on the face of the stele is the medallion portrait of Macé (a system which escapes the difficulty of a realistic full-length statue); at the foot of the stele are pretty figures of a boy and girl on the way to school, applauded and encouraged by a draped female who sits at one side. The whole is a good typical example of a kind of monument in which French sculptors excel. Among ideal works which are worth special mention are M. Manguet's "Bacchante invoking the god Pan," whose sneering head is fixed on a term—a kind of subject the

* Concluded from p. 481 ante.

* The plaster version was illustrated in the *Builder* for July 15, 1899.

French are very fond of; M. Marioton's pretty figure, "Méditation," standing with her feet crossed; M. Gustave Michel's fine and pathetic figure of an aged man—"Au Soir de la Vie"; M. Hector Lemaire's "L'Offrande"; and M. Coutheillas' beautifully modelled recumbent figure, "La Fin de la Cigale." We have seen, however, better sculpture years at the Salon than the present one.

A word on two new architectural works, already frequently mentioned in our Paris correspondent's communications. Only a few minutes' walk from the Palais de l'Art is the memorial chapel on the site of the fire in Rue Jean Goujon, a visit to which seemed a matter of course while one was in the neighbourhood. It is characteristic of the energy of the French in these matters, and their artistic enthusiasm, that they should think nothing less would suffice for such a memorial than a fine stone church filled with sculpture and decorative materials, erected at a cost of 40,000*l.* exclusive of the site; while in London an obelisk with an inscription would have been deemed sufficient. The building, of which M. Guilbert is the architect, was illustrated in elevation in the *Builder* for July 30, 1898. The effect of the actual building is still better than the illustration conveyed; the interior circular church is only spoiled somewhat, to our thinking, by the colossal gilt figure of the Virgin, the "Mater Consolatrix," in front of the altar; a pathetic statue in itself, but far too large for the building, and dwarfing the architecture. This is a kind of religious statue, however, which we believe appeals to the feelings of devout Catholics, and is to be judged from a religious rather than an artistic point of view. Behind the church is a cloister divided into bays each of which is appropriated to a special monument to the friends of those who wished or could afford to have such a monument; the lower part is in marble, with an inscription, perhaps a figure, or a medallion portrait of the deceased; the upper portion in each case is occupied by a silvered metal relief from New Testament history, in a panel; these panels are all alike, the lower portions of the monuments vary in treatment. They are nearly all to titled people, including that brave lady the Duchesse d'Alençon, who quietly died in the fire, refusing to make any effort to save herself at the expense of other persons. Her monument is the central one, with her medallion portrait over it. The whole thing is not only artistically impressive, but in the highest degree pathetic.

Another evidence of the architectural inventiveness and energy of the French spirit meets the visitor in walking up the left bank of the river from the Pont de la Concorde. Is this a new palace that rears its great mass along the road bordering the quay, this vast façade in all the bloom of new bright stonework, and sumptuously decorated with sculpture and carving? Not at all; this is the new railway station of the Orleans line. Entering the station we find, instead of the usual engineers' glass and tie-rod roof, a great semi-circular barrel vault decorated in coffer, with skylights interposed at intervals, following the curve of the roof. Exterior and interior are alike architecturally impressive. Are railway companies so devoted to art in France? Not exactly, explained a Frenchman to whom we commented on this bril-

liant display. It is the City authority which is at the bottom of it. The railway company has to buy the land from the Municipality, and the Municipality will only sell land in such a position with the condition that something is erected on it which shall be an ornament to the city. What a lesson to London, where money considerations alone rule in such a case; where any railway company may build the ugliest erection it pleases so long as it has paid the price of the land; where the City authorities themselves are bent to spoil their grandest bridge under a pretence of needing increased accommodation; where the County Council resent the proposal to introduce architectural design into a new bridge. Truly, "they manage these matters better in France."

NOTES.

The Origin of Egyptian Architecture.

PROFESSOR FLINDERS PETRIE'S lecture on this subject at the Institute of Architects was not only full of interesting matter, but was a model of clearness and logical arrangement. He certainly brought out in a very strong light the manner in which features of Egyptian architecture were derived from nature and from very primitive construction in perishable materials, but he seemed to be rather too much disposed to think that the interest of the architecture diminished as it receded further from the direct imitation of nature and of primitive construction; whereas the real, the aesthetic interest of architecture commences when these natural origins are forgotten. The remark of Sir Martin Conway, that it was interesting to see the same thing going on now, when we were imitating in iron the forms of stone columnar architecture, was still less to the point. The cases are not parallel in the least. All architecture goes back ultimately to the hut or the wigwam; those who first evolved an architecture from these primitive sources were doing the best they could in what was then an entirely new field of human invention; but that is no excuse for modern architects, whose power of aesthetic reasoning ought to be fully developed, imitating in one material the forms proper to another. That is not doing their best with the materials in their hands; it is merely the result of intellectual indolence and want of thought.

Liverpool Cathedral.

WE published a letter last week from a correspondent who complained that nothing seemed to be promised as to the architect or the architecture of the proposed cathedral at Liverpool, if erected. We have since received a cutting from a Liverpool paper describing a meeting held a few days ago, under the presidency of Sir W. Forwood, to discuss the question. Judging from this report, the whole question was discussed solely in regard to its financial side, and the difficulty of raising the necessary funds, and the importance of having a widely extended area of subscribers. Not a word appears to have been said as to the architectural aspect of the matter, but it is announced that steps are to be taken to call a public meeting to consider the subject, and perhaps on that occasion some one will have the courage to suggest that there

are other things to be considered in connexion with a cathedral project besides paying for it.

Abhey Dore Church.

A COMMITTEE has been formed, under the presidency of the Bishop of Hereford, for raising a sum of 6,000*l.* for necessary repairs to this fine church. Mr. R. W. Paul, who has given special attention to this building and made a good many new discoveries in regard to it, is employed as superintending architect, and under his direction we may be quite sure that the work will be confined to *bona-fide* repair, and that no restoration, in the objectionable sense of the word, will be attempted. From Mr. Paul's detailed Report to the Provisional Committee it appears that though the main walls are sound for the most part, some portions of the building are in a dangerous state. The upper part of the tower is seriously out of position and requires immediate attention; and the plaster ceiling is constantly falling, and the floor of the church is in a very damp state, and unhealthy owing to the condition of the vaults. Much of the glazing requires repair, and the roof, covered with old stone tiles, requires to be relaid, and boarding and felt provided. New choir stalls and other fittings are also required to put the church in a proper condition for service. It is estimated that 6,000*l.* will be required for the work contemplated. Abhey Dore was illustrated in our issue of April 4, 1896, in the series of "Abbeys of Great Britain," from drawings made by Mr. Paul.

British Fire Prevention Committee.

THE new testing station of the British Fire Prevention Committee, which was put in use for the first time on Wednesday last, is conveniently situated close to Royal Oak Station on the District Railway, so that it is easier of access than the former one. As before, the Committee have secured an old dwelling-house for offices, and have erected their testing-houses in the grounds. The houses are on the same model as before, but one of them is a good deal larger than any of those on the old ground, for testing larger areas of floor, &c. The principal test on Wednesday took place in this house, the subject of test being a portion of fireproof floor 22 ft. in length (the full length of the testing house), made by the Banks' Fireproof Construction Syndicate, and consisting of rolled beams embedded in concrete, and carrying an armed plaster ceiling underneath supported by metal stirrups from the beams. The test was still in progress when we left; the particulars will no doubt reach us in due time in the usual formal report of the committee. The Syndicate had asked for a three-hour test for this floor; and it appears that there is now a kind of rivalry among fireproof constructors for length of test. This must have a stimulating influence on the improvement of fireproof construction. A model of the testing houses and plant was to be seen in the offices, prepared to be sent to a fire-prevention exhibition at Berlin.

Road Maintenance.

THE seventh annual report of the State Commissioner of Public Roads of New Jersey contains voluminous tables arranged so as to show the characteristics of each piece of road made during the year 1900, the reduction in grade made at the time of improvement, the cost of the stone at the quarry,

and the expense of delivering it on the road. Maintenance of the New Jersey roads is made the subject of a special report by the State Road Supervisor, who advocates a system of continuous repairs according to methods which he proceeds to describe in detail. The figures contained in the reports permit of interesting comparisons being made with those of the Massachusetts Highway Commissioners for the same year. In both these States considerable signs of improvement are evidenced, and practice in the two is becoming more uniform, although local conditions necessarily cause some essential differences. In one respect, however, the states are thoroughly in accord, for the highways are being steadily improved in quality. Similar developments are to be found in this country, for, speaking generally, our local authorities are fully alive to the benefits to be derived from good roads. Much remains to be done in the direction of securing uniformity of practice in different parts of the same counties, as those who have opportunities for inquiry know full well. But, taking them all round, country highways are fairly satisfactory. We should very much like to be in a position to say the same of London streets and roads. Practice is extremely varied, and uniformity is only evidenced in the execrable character of all thoroughfares that have seen any considerable amount of traffic. Rugged macadam, undulating asphalt, and bumpy wood paving, are in evidence everywhere. Some allowance must of course be made for the ruinous effects of heavy traffic, but it ought not to be beyond the resources of modern engineers to construct a roadway of far more uniform resistance than most of those now existing. In some parts of the metropolis the roads are reasonably good; in others, where no more traffic is experienced, they are atrociously bad. Perhaps the worst carriageways of all are those in the quietest and wealthiest parts of the West End, and in the Royal parks where no heavy traffic is allowed. To those responsible for such eccentricities we commend a perusal of the reports to which attention has been directed.

In his recent Friday evening discourse at the Royal Institution Dr. Chunder Bose gave a *résumé* of his experiments proving that there was a regular law underlying certain phenomena exhibited by both organic and inorganic matter. In papers published in the Proceedings of the Royal Society last year Dr. Bose described his discovery of how metals were sensitive to electric radiation, or possessed, as he calls it, "electric touch"—the resistance of some increases when electric radiation falls on them, whilst in other cases the resistance is diminished. In his lecture Dr. Bose passed from the domain of physics into the domain of physiology, and elaborated the analogies between nerve and muscle diagrams and the diagrams got by stimulating inorganic matter mechanically or electrically. For example, he showed, by means of a model apparatus, how the response curves got by dosing a liquid connecting two metallic wires with various "drugs" gave phenomena analogous to the effects produced by these drugs on living tissue. Some produced stimulation, others depression, and "poisons," like corrosive subli-

mate, killed the electric action altogether. He showed a wonderful model of an electric eye, which was sensitive to every kind of radiation. It acts according to physical laws which Dr. Bose has discovered, and seems to work in the same way as the living eye works when it sends an impulse to the brain on being exposed to light. He seems to have discovered principles which explain perfectly certain phenomena which have been known for many years to physiologists. We are glad to hear that he has been given leave by the Indian Government to stay in England to complete his investigations. The scientific world is already deeply indebted to him, and it seems to us that the Bose coherer may have important electrical applications. The drawback to the Marconi and other coherers in use in wireless telegraphy is that they are not self-recovering, but need troublesome and destructive tapping devices. A coherer based on the "Bose effect" would be completely self-recovering and would enormously simplify the required mechanism.

The project is again revived of pulling down the Old Red Hall, at Bourne, Lincolnshire. Its demolition was proposed ten years ago by the Great Northern Railway Company for the construction of their line from Bourne to Saxby, but the scheme was warmly opposed, and the house was spared for a while, being reserved as a residence for the railway station-master, and for purposes of the station. The house is one of the finest specimens of a red brick early sixteenth century mansion of which the county can boast, and formed during a long period the home of the Digby family, including Sir J. Everard Digby, and Sir John Thimbelby, who were implicated in the Catholic rising that followed upon the Reformation. The house, having a gable roof and stone mullioned windows, with a richly panelled and carved interior, and a fine oaken staircase, and standing at the southern entrance into the town, has extensive grounds, and is partly surrounded with water.

This subject was considered in a paper by Mr. Percy Fitzgerald, followed by a discussion, which appears in a recent issue of the Society of Arts *Journal*. Mr. Fitzgerald's main point (which we have met with before) is that "the scene" is the centre in which the action goes on, not the whole stage space; that in Garrick's time the stage was lighted by four large chandeliers hung over the actors, which furnished a central zone of light within which the actors kept, and the surrounding accompaniments were left in comparative obscurity. We should say that such an arrangement would very much hamper the actors in freedom of movement, and that footlights are a most useful addition both in generally lighting the stage, and in partially screening off the audience from the view and the consciousness of the actors. With those who urge that the acting should be the real aim and end of theatrical production we are entirely in sympathy, and it is a fact that the public go to see some plays now more for the spectacle than the acting. But we fail to see any reason for thinking that finished and realistic scenic accompaniments are any bar to good acting; or that, the acting being

good, the effect is not assisted by a well-mounted scene. In plays of modern life, especially, it is important that a large country house, for instance, if the action is supposed to take place there, should be represented by an interior that we might expect to find in such a house, not by a room looking as if it belonged to a seaside lodging. We may like a fine stage effect without being in any way less exacting in regard to the acting; many persons (the present writer included) who go to see a modern spectacular play often come away vexed and disappointed with inferior acting; but there is no reason why the acting should be inferior because the scenery is fine; and where the acting is good, scenic effect helps it. One point we do fully agree with in Mr. Fitzgerald's paper is in regard to the absurd neglect of scale constantly seen in theatrical erections, where the vicar's house, as he says, is only a few feet higher than the vicar, and a whole cathedral is shown no larger than Bonchurch church. The scene in such a case should show part of the building on the right scale, and so designed as to leave you to infer the existence of the portion which cannot be comprised within the stage focus.

THOSE who are interested in seeing the artistic standard of our coinage and commemorative medals improved, should feel grateful to Sir Charles Dilke for pointedly calling attention to this subject in Parliament a few days ago. He asked on what principle the artistic work of the Mint was done, and observed that it was beginning to be realised that the medallist's was one of the highest forms of art; that in foreign countries, especially in France, this art had been revived and carried to a high standard of excellence, and that we were conspicuously behind in this respect. When we consider that in France medals and coins are in the hands of such artists as M. Chaplain and M. Roty, and that in England no one usually cares to ask how or by whom they are designed, one must admit that Sir C. Dilke's protest was not uncalled for, and it is to be hoped that it may not be without some result.

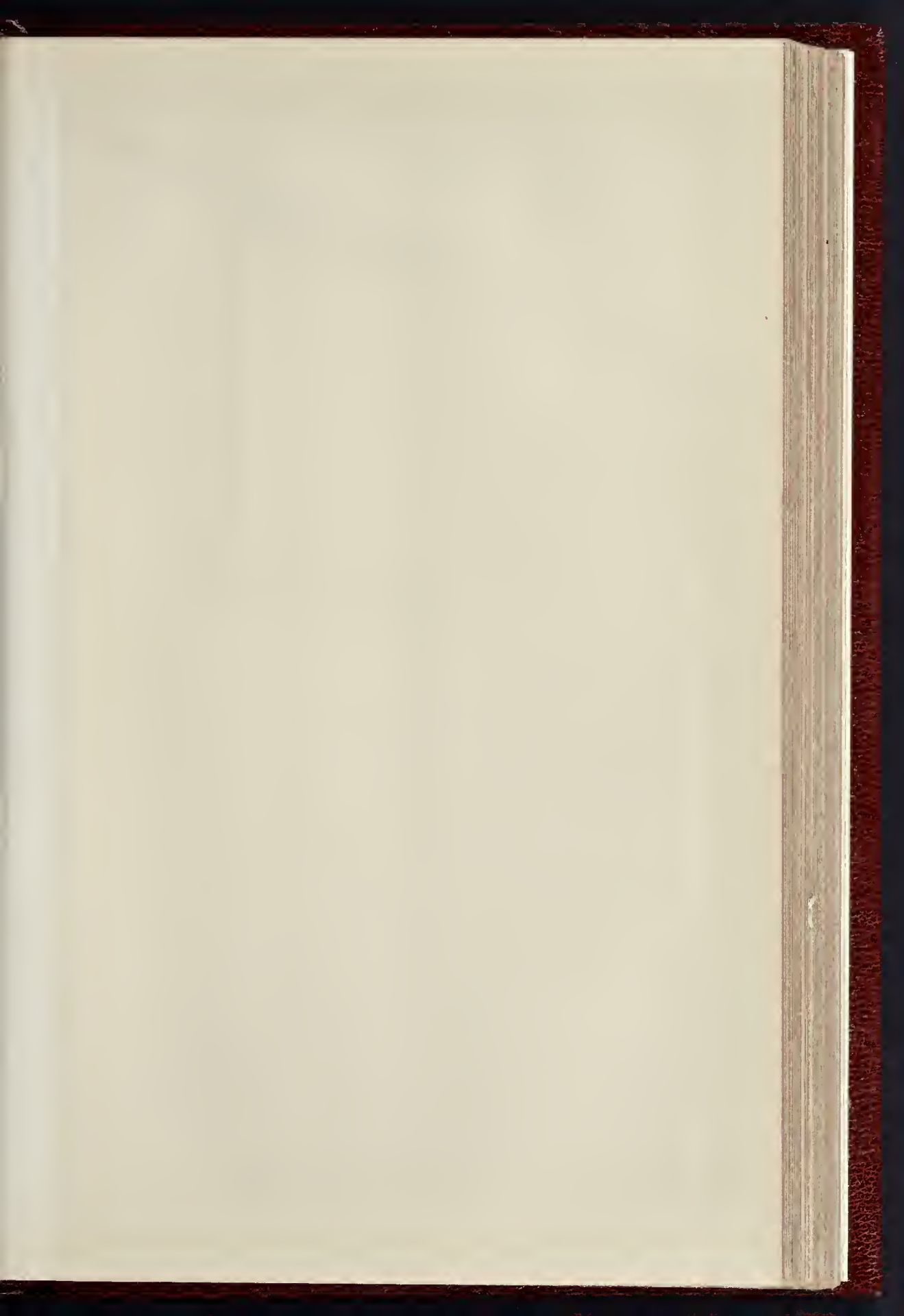
ARCHITECTURE AT THE ROYAL ACADEMY.—II.

In continuing our comments on some of the architectural drawings at the Royal Academy, we may perhaps in the first instance notice those of the church designs, not already noticed, which present anything for special remark. The first in order of hanging is Mr. Marshall Mackenzie's "Greyfriars Church, Aberdeen," (1,531) a pen drawing of a western tower with a slender crocketed spire rising from the centre of it, behind the parapet; a treatment rather more suitable to a timber spirelet than to one which appears to be, as far as one can judge from the drawing, of the same material as the tower. A stone spire seems to demand a visible connexion with or growing out from the masonic design of the tower. The general style of the design is a good deal similar to the same architect's fine work in the additions to the Marischal College, and is probably intended for the same material—granite. Another Scottish church is Mr. Stevenson's "New Church at Stirling" (1,539) for the Free Church of Scotland. This is an exceedingly solid piece of building, on the tower of which the architect has again introduced the "crown" modelled on that of St. Giles, Edinburgh, as he did in a former church. The meeting hall planned in connexion with the church is placed at a slightly oblique angle with the main building, probably from some

The Electric Eye.

Principles of Stage Scenery.





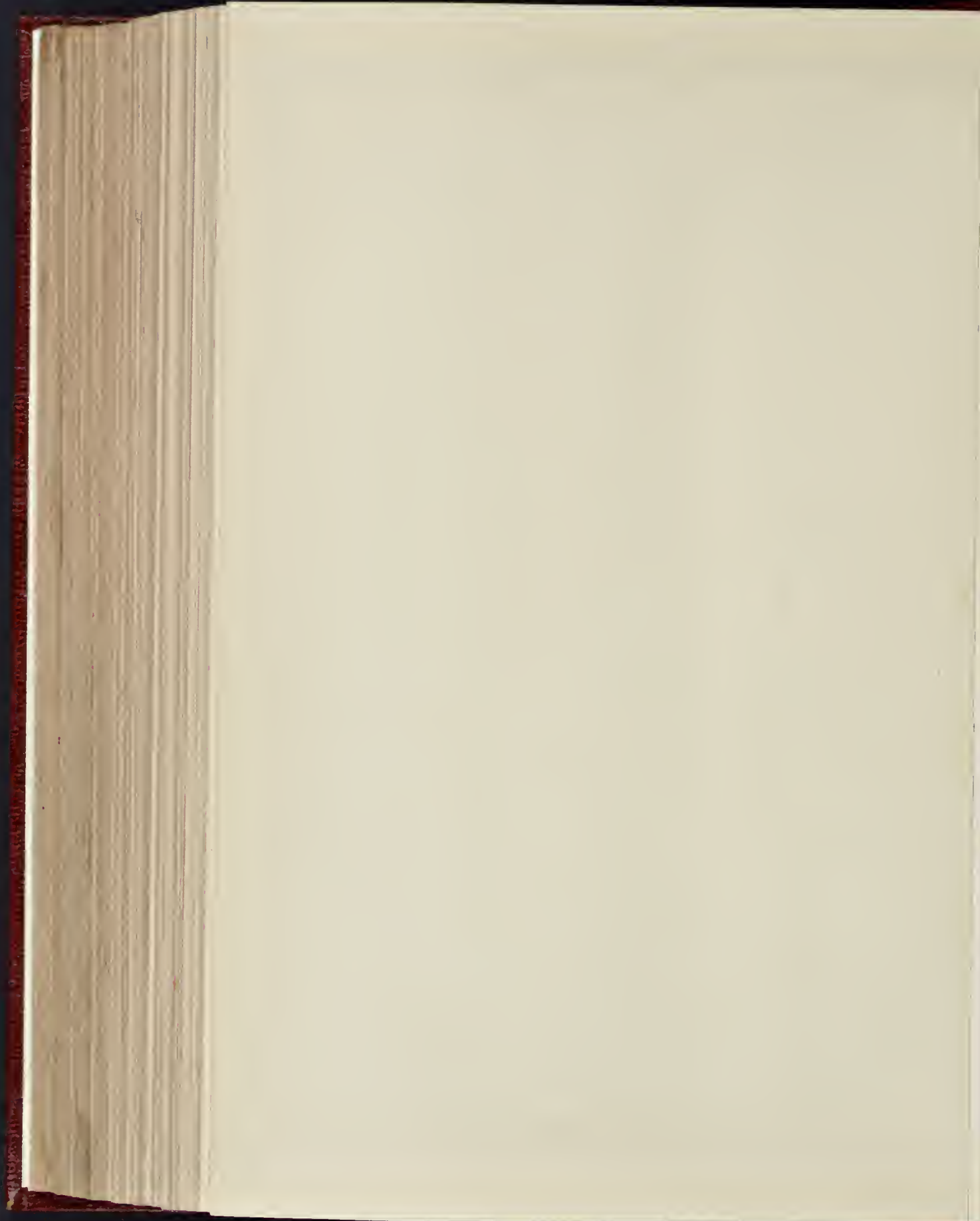


RIMINI CATHEDRAL PART OF SO



INK PHOTO SPRAGUE & CO. 3 A S. EAST HARDING STREET, FETTER LANE, E.C.

SIDE, DETAIL OF CHAPELS



unavoidable requirement of the site, and certainly to no injury to the effect. There is a general aspect of massiveness and simplicity about the whole treatment of the church which is satisfactory.

Mr. W. D. Caröe is a large exhibitor in the way of church architecture. His Church and Rectory at Stoke Damerall is shown in an exterior perspective (1,541) with an interior view of the church (1,543); the latter is original and characteristic in treatment; the arch mouldings spring from the piers without the intervention of caps; the roof is carried by what may be called stone principals—stone pointed arches over each pier; the wooden roof between these is also in a pointed arch section, but not concentric with the stone arches, although not differing much from them in line. This seems a mistake; it gives the idea of their having been intended to be concentric and being accidentally set out wrong; it seems to us that in such a case the timber roof should either be decidedly different in section from the stone arches, or should be on the same sectional line: one or the other. This is a church with three complete aisles and two narrow side-aisles for passage; it is the passage-aisle device applied on each side of a complete nave and aisles plan, instead of reducing the church to a nave only. There are a good many nice points in the exterior design; the contrast between the plain and bold treatment of the lower part of the tower and the enriched upper story; the square turrets flanking the east end and finishing with a group of niches and figures, two on each face; and the exterior treatment of the buttresses over the passage-aisles, which is very characteristic. The east end of the church seems a little too much cut up, and might have been simplified with advantage, and we do not for our own part, like the effect of the over-sailing pinnacles at the angles of the tower, rising from gargoyles' backs; of course it is a detail indigenous to that part of the country, and to be seen in old churches, but is it worth imitating? It produces a bad outline at the finish of the tower, and looks rather gimcrackish. High Wycombe Church (1,547), by the same architect, is illustrated in this issue, and under the head of "Illustrations" the reader will find the architect's description, and the reason for the peculiar treatment of the east end. The "Proposed new chapel &c. to the Bishop's Palace, Liverpool," (1,540), also by Mr. Caröe, is illustrated in a frame of drawings; the additions, distinguished from the existing portion on the plan, consist of a long corridor wing with various subsidiary rooms, terminating in the chapel turned round again at right angles; this is a quiet piece of domestic Gothic; the large traceried staircase window adjoining the chapel is ecclesiastical in character to suit its neighbourhood (it looks a little as if the chapel extended to the outer wall and this were its west window). In the interior view of the chapel stone arched principals are again shown, but this time in a much more satisfactory manner, as they are totally distinct in section from the ceiling; the stone arch is a low pointed one with open tracery in the spandrels, and coming well down to the walls; the ceiling is a flat segmental arch, not quarrelling in any way with the line of the stone arches; the effect of this is very satisfactory.

Mr. E. B. Lamb's small drawing for "A Private Chapel in a Nobleman's Park" (1,550) shows a pretty design, but to give a chapel of that kind a picturesque or "rural" character is we think a mistake. A park is more or less artificial scenery, and we should expect to find a chapel in a nobleman's park marked by a somewhat classic architectural character, rather than what is shown here. Mr. Watson's "St. Peter's, Cricklewood" (1,557) is a pretty little drawing of a country church. Mr. J. J. Cresswell exhibits an elaborate tinted perspective drawing of the interior of a design for a stone vaulted church; a very good drawing, showing a vault of the type which was the precursor of the fan vault, &c., a many-pannelled vault with a severe square on plan; we can hardly think this, however, other than an anachronism as the roofing of a modern church; and as a matter of proportion, the vault seems unduly lofty in comparison with the substructure. The "Church of St. Mary, Barry Dock" (1,628), by Mr. G. E. Halliday, and that of "St. Peter's, Oystermouth" (1,643), by Mr. E. Bruce Vaughan, are what we should call highly respectable designs in modern Gothic, not presenting anything of special interest in

character. Mr. F. L. Pearson's "St. Matthew's Church, Auckland, N.Z." (1,666) is shown in a large and fine perspective drawing without any plan; it has very much the character of some of his father's churches, and indeed reminds us a good deal of the late Mr. Pearson's large church in the outskirts of Birmingham—we forget the name of the district. Mr. Fellowes Prynne's "Design for Church, Lower Sydenham" (1,680), is shown in a small very highly finished watercolour drawing, but again no plan; what is shown is apparently the west end; a brick church with stone bands and dressings, the façade flanked by large and bold octagonal turrets, kept plain below and with an enriched upper story and cupola roofs; in the lower portion a wall stretching between these turrets apparently forms a narthex. But this is just the kind of drawing which should have had a plan to explain it.

Mr. Lamb's "Design for a National Monument to British Heroes" (1,664) is in some respects so much like a church that it may be classed with them. It is a fine conception, which would have been worth illustrating in a larger and more finished drawing. It is a design on a square plan with a lofty central tower and spire, and octagonal turrets at the angles, ending in spirelets; the whole making a pyramidal composition, with a kind of slate or professional road up to the main entrance. The detail is Gothic. With church architecture we may class also Mr. Slipworth's charming drawing of a "Churchyard Cross, Erected at Leasingham, near Sleaford" (1,691). The cross, which takes the form of a crucifix, is treated with great originality and refinement of detail; the remainder of the design is very simple, but in excellent proportion and balance of parts.

From the churches we may proceed to notice some of the designs in public and street architecture not before mentioned. Mr. Leonard Stokes's "Central Boys School, Oxford" (1,529), is exceedingly picturesque, with its two stone bays in the centre of the front, and the entrance between them contrasting with the simpler treatment of the remainder of the exterior. The plan, however, is the most interesting feature; it shows a central hall which may be said to consist of a circle inscribed in a triangle, the angles of the triangle forming bays opening out of the circle. The class-rooms, &c., open out of this hall. There is some question, however, as to the lighting of these class-rooms; the two sets face opposite ways, one with east light, the other with west; the former is all right, the latter is not so good, though better than south. It is not obvious how the centre room on the right of the plan is lighted at all; there is no window shown. But this is a very interesting and original plan. Mr. Prior's "New Medical Laboratories, Netley" (1,542) reminds one somehow of the bottom of Essex-street, Strand, with its square mass and large pilasters, but there is a bold contrast given by the rusticated basement with its prison-like round-headed windows, and the light colonnaded open corridor adjoining; it is a very characteristic bit of building shown in a very nice shaded drawing; but it should have had a plan to explain it. Mr. G. C. Horsley, in the drawing of his "St. Paul's School for Girls, Hammersmith" (1,550), shows a plan but no compass, so that we can form no opinion as to the aspect of the class-rooms, which face opposite ways; and aspect is so important in regard to class-rooms that information on this point should never be omitted; the suitability of the plan turns on that more than on any other single thing. The treatment of the centre and wing fronts, with their sculptured panels, is bold and effective in a broad and simple manner; but surely the windows in the portion between these, like ordinary speculating builders house windows, are rather unnecessarily commonplace.

The recent competition for dock offices at Swansea is illustrated by two designs, that by Messrs. Mills & Oldham (1,552-53), and that by Mr. E. Hazell (1,554). The coloured elevation of the former is a very nice bit of work; the building is treated with a ground story of rusticated masonry, and an upper story of brick with stone dressings and with a stone carved shield and ornaments on the upper portion of each pier between the windows. The objectionable feature is the piece of plain brick wall above part of the cornice, which comes in clumsily, and spoils the effect of the whole. No plan is given either with this

design or Mr. Hazell's, the latter a suitable and refined design for the most part, but the corbels under the large projecting angle-turret are much too weak. Mr. Doughty's "The Borough Club, Nottingham" (1,551), is a pretty bit of street architecture, decorated with carved panels, and shown in a pretty drawing.

Mr. Rupert Savage's "Assembly Hall, Belfast" (1,572), is a larger and more important building, of which the plan is shown, a good one in the main, but the corridor running parallel with the entrance part must be rather deficient in light. The general style may be described as Domestic Gothic; the best point in it is the bold treatment of the masses of wall on each side of the entrance; but as a whole the design is consistent and suitable. Messrs. Bradshaw & Gass's "Thomason Reading-room, Bolton" (1,575) is a pleasing building of its class, and has the merit of having a plan with it.

Mr. Emerson's "Hamilton House" (1,582) is the building which was illustrated in our issue of July 22, 1899. Beneath it is his larger drawing in colour and very well executed, of the "Royal Caledonian Orphan Asylum, Bushey" (1,584). This again, like so many other drawings in the room, is merely a picture of a building in which plan is of paramount importance, and one can form no idea of its value apart from that. The building is a pleasing looking one as a whole, but we do not like the detail very much.

Messrs. Young & Hall's "New Premises for the Express Dairy Company," on Ludgate-hill (1,590), is a pretty drawing of a street front with a good deal of character, but does not the arch over the balcony level look a little too heavy for the rest of the design? Messrs. Wimperis & East's "Rebuilding of Reynolds's House, Leicester-square" (1,589) looks very well in itself, but we should certainly have preferred to have seen it carried out in a style more in keeping with the memories of Reynolds and his day and taste; no one who was told that Reynolds's house in Leicester-square still existed would ever think of looking for it behind this front; and this is a case in which the old associations of the Reynolds period might very well have been kept in memory. Apart from this, the two bays with the way line of the iron railing at the top, are picturesquely treated; the windows in the flat of the wall look rather unnecessarily mean and unconnected with the rest of the design. In the same neighbourhood Messrs. Henman & Cooper's "Block of Professional Chambers, Cornwall-street, Birmingham" (1,592) is a very pleasing piece of street architecture, apparently brick and terra-cotta; the manner in which the recess between the two bays is made use of for a bit of architectural effect, by the pier in front of it on one story and the two columns on the other, carrying the line of the wall across, is most praiseworthy.

We will continue our comments on the architectural room on another occasion.

A YEAR'S BUILDING OPERATIONS IN LEEDS.—The report of the Leeds Building Inspector (Mr. W. Towers) for the twelve months ending March 25 last shows that the year was a busy one in the building trade. The total number of plans submitted to the Building Plans Committee was 2,839, or sixty-five more than last year, and the total number sanctioned was 2,199. But the number of buildings shown on the approved plans, 8,952, was 487 less than in the preceding twelve months. Of these buildings, 2,947 (on 531 plans) were houses, and 1,807 mills, warehouses, stables, sheds, and workshops; 2,427 represented additions and alterations, and 1,771 conveniences. In the previous year there were 3,519 houses, and 2,030 mills, warehouses, stables, sheds, and workshops. The 2,947 houses for the building of which authority was given comprised nineteen villas, eighty-eight semi-detached villas, 812 through houses, and 2,028 back-to-back houses. The latter figure is less than in the preceding year, when 2,300 back-to-back houses were sanctioned. The number of through houses is smaller, by 285, and semi-detached villas less by forty-five, while the number of new detached villas for whose construction authority has been given is just the same as last year. During the past year 3,030 houses (including 2,035 back-to-back houses and 997 through houses) were completed and certified for occupation, a decrease of twenty-nine; while 1,597 miscellaneous buildings (including churches, chapels, schools, hotels, and other institutions) have been so certified.

NEW THEATRE, YORK.—The plans for the New Theatre, Clifford-street, York, on the site of the Corn Exchange, prepared by Mr. John P. Briggs, of London, were submitted to the City Council on May 14, and were approved.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held at No. 9, Conduit-street, Regent-street, on Monday last, Mr. William Emerson, the President, in the chair.

The late Mr. Arthur Cates.

The minutes of last meeting having been taken as read,

Mr. John Slater said that before the business was proceeded with he wished to say a few words in regard to their deceased friend, Mr. Arthur Cates. During the last ten or twelve years he (Mr. Slater), perhaps more than most men, had had opportunities of seeing that side of their deceased colleague's character that was very little apparent to those who only met him in an official capacity. Mr. Cates was essentially a strong man all round, and one sometimes regretted, perhaps, that he was a little too prone to show his strength, but under a somewhat forbidding exterior there lay one of the kindest hearts that ever beat in human breast. He had sometimes thought that Shakespeare's words in describing the haughty, overbearing Chancellor of Henry VIII. were very applicable to Mr. Cates—"lofty and sour to them that loved him not, but to those men that sought him, sweet as summer," and he knew personally that not a few young architects had had occasion to be grateful to Mr. Cates for the kind advice and assistance given them as ungrudgingly as unostentatiously. To see Arthur Cates in his favourite Sunday morning walks around the Zoological Gardens describing the peculiarities of some of his pet animals to a group of keenly interested and laughing children was an absolute revelation to those who only knew him in his official capacity, and his death had left a void in the hearts of his friends and acquaintances which it would be very difficult to fill. Mr. Cates was not only an able man, but he was a very learned man, and he (Mr. Slater) had been much struck on frequent occasions to see the evidence of the very wide reach of his reading and learning. Of his interest in and services to that Institute it was too early to speak, and it was too soon for them to attempt to appreciate his loss. The work that he did in instituting the examinations—whatever might be the opinion of the general public as to their value or not—could hardly be over-estimated, for if it had not been for Mr. Cates he was quite sure that those examinations would never have been started, and the energy with which he pressed forward his views and carried them was a striking tribute to his character. He was an ideal chairman of committee, and the frigidness which sometimes characterised him when he was simply sitting on a board absolutely disappeared when he was in the chair. In that capacity he was always urbanity itself, and the way in which he gave any member of any Board an opportunity of expressing his opinion was remarkable, and it was a perfect treat to see the way in which he got the business through. No doubt in their *Journal* they would have from the pen of some one who knew Mr. Cates longer than he did a record of his life and work. That night they could only regret his loss, and he was sure he was only expressing the feelings of all who knew him when he said "that he was a man, take him for all in all, we shall not look upon his like again." He would propose that a sincere vote of condolence be sent to Mrs. Cates from the Institute in the loss that she and they had sustained in Mr. Cates's death.

Mr. Woodward said that, before the vote was put, he would like, as Mr. Cates's oldest assistant, to add a few words. It was now some twenty-five years ago that he first entered the office of Mr. Cates, and in those early days they worked from morning to night—because Mr. Cates was a very great worker—and he had had the benefit of receiving the strong tuition to which Mr. Slater had referred. Mr. Cates was a man of very considerable literary attainments; he was a great bibliophile and a voracious reader. His passion for work was well known to members of that Institute, and that passion for work permeated his office, and, unfortunately, did not leave him when he went home. He did a very great deal of work connected with the Institute at home. His memory and powers of observation were wonderful, and he was able to describe with considerable minuteness nearly every building that he had seen in his tours abroad. Another feature which his (Mr. Woodward's) acquaint-

ance with Mr. Cates led him to point out was the marvellous facility with which he could grasp the contents of his daily correspondence, and he also possessed wonderful powers of placing his reports in official language in a brief, terse, and marvellous fashion.

Mr. T. M. Rickman said he would like to add a few words to those already uttered in respect to the grief they felt at the death of Mr. Cates. He had had the pleasure of working with Mr. Cates on committees, although not always on the same side, and he was quite satisfied that, though he was at times somewhat pug-nacious, there was no one more upright in the profession, and no one who had the interests of the profession more thoroughly at heart; and although he sometimes spoke of himself as the drill-sergeant, one could never have an interview with him without feeling that one had learned a considerable amount at his hands, and he believed that all those who had had the privilege of being educated by him had left him with great hopes of future progress. He cordially supported the vote of condolence which it was proposed to send to his widow.

The Chairman briefly supported the motion, and said that it was only of late years that he had got to know Mr. Cates well, and he was astonished to note his wide learning and his comprehensive grasp of all subjects connected with the architectural profession and his very deep interest he took in the Institute. His loss was a very great one to them, for his work in connexion with the Institute had been useful in the highest degree.

The resolution was then carried.

The Late Mr. E. Gregg.

Mr. Graham said he had to announce with regret the death of their colleague, Mr. Gregg, who was first elected a Fellow of the Institute in 1870, and whose general presence was always welcomed in that room. He was a very active member of the Institute, and took a great interest in everything that was done, and his services for a number of years as a member of the board of examiners reflected great credit not only upon his ability, but upon his assiduity and his devotion to the Institute. The board of examiners would miss his co-operation very much as he was always willing and anxious to fulfil the work entrusted to him thoroughly and conscientiously. As a mark of respect to the memory of their late friend the Institute sent a wreath to his grave, and it was proposed that a letter of condolence be sent to the relatives of their deceased colleague. He asked the members to approve the action taken by the Institute in the matter.

The motion was carried in silence.

Professor W. M. Flinders Petrie then read a paper on the "Sources and Growth of Architecture in Egypt," of which the following is an abstract:—

The Sources and Growth of Architecture in Egypt.

The author said that in no respect was our view of the origins of the arts more enlarged than in the architecture of Egypt. Ten years ago we were starting with the most highly-finished work of the Fourth Dynasty, the great pyramid of Khufu, and were groping in the dark for any clues to the growth of such surpassing construction. To-day it can be shown how every feature arose, and the adoption of stone for building can be dated to a single generation. The unwrought materials, which were everywhere to hand in Egypt, were palm-ribs, papyrus, reeds, maize-stalks, and mud, together with palm-fibre roughly twisted.

A striking sight of the beginnings of the building art may be seen any day in a nomad settlement on the desert edge. Side by side stand (1) a black goat-hair Arab tent, long and low, open always on the leeward side; (2) a tent fenced along part of the open side with a row of maize stalks; (3) a tent fenced all round with maize; (4) a tent in a maize fence mud-plastered; (5) a dwarf wall of brick round the fence; (6) a high brick enclosure with a tent inside to roof it, the tent ropes stretching out through the wall; and lastly, a roof is put on the wall, and the tent has disappeared.

The early Egyptians seem, however, to have usually roofed their reed huts with domed roofs, to judge from the engraving of a hut on ivory, at the rise of the First Dynasty (4800 B.C.). The best feature is the strengthening of the corners of the hut by placing at each angle a bundle of reeds lashed together, as seen in the hut on the mace of Narmer. Here we

have the origin of the torus-roll down the edges of the buildings, used till the latest stage of the architecture. The lashing together was always retained as an ornament, although the meaning of the roll was long lost.

When papyrus stems were used for walling, instead of reeds or maize stalks, the top was rather weak if stripped of its leaves; hence they were retained and bound together, and the feathery tops served as a barrier above the wall, and finally as an ornament.

Besides these materials, palm-ribs may be seen still used for fences. They are set upright with all the leaves on them, at a few inches apart, and strengthened by other ribs interwoven diagonally each way; just below the weak part of the tip a line of ribs is lashed on with palm-fibre, and the loose nodding tips serve as an effective barrier to men and animals. The whole is finally plastered with mud up to the top lashing, and forms a very strong fence, which will last for many years. Such a fence or wall is figured as the front of an early shrine hieroglyph in the Fourth Dynasty. Translated into stone, this became the constant feature of every Egyptian building, and this cornice retained to late times the palm-leaf ribbing which proclaimed its origin.

We have preserved to us some views of simple shrines made of the natural materials, similar to the huts of maize stalks still used by the peasant. Here we note the roof sloping backward, and carried on far before the open front, so as to cast a shade, while it is supported on two front pillars of stalks. This was the original type of the rustic shrine adopted as a hieroglyph, and preserved to us from the Fourth Dynasty.

The next material to be noticed is mud-brick, one stage beyond the rough mud plastering. Brick houses and town walls remain from the prehistoric age, probably about 6000 B.C.; and a model of a town wall, with watchmen looking over it, belongs to a rather earlier time.

Regular brickwork developed in use in the prehistoric time, and some arched brick tombs are probably of this age. There can, however, be no doubt of the barrel-vaulted passage in the tomb of King Neter Khet (found this year) belonging to the beginning of the Third Dynasty (about 4200 B.C.), and the magnificent brickwork and arching of the Fourth Dynasty (about 3400 B.C.) shows a long familiarity and free use of it.

Coming to wrought materials, wood was the earliest in use for construction. The prehistoric graves were often lined with matting, and this was, in the later prehistoric, sometimes supplanted by a wooden lining. In the royal tombs at Abydos (4700-4500 B.C.) all of the wooden sides have been destroyed; but the evidences remain most clearly on the cross walls that were built to form cells around the wooden chamber for the offerings. These walls are plastered and whitewashed on the sides, but the ends are all rough brick, evidently built against a pre-existing timber wall, as the mud mortar has taken the cast of the grain of the wood wherever it touched it. The floors were usually of wood; one of the most complete shows the boards about 2 in. thick, resting on beams at the sides and down the axis of the chamber. The roofing was also of wood, as in some cases the casts of the rough-hewn ends of the roofing beams remain in the brick walls of the chamber. The author referred to the tombs of King Qa (4650 B.C.) and King Zet (4600 B.C.), and gave details of their construction. This form of construction is the forerunner of the greatest architecture of the pyramids. For the wooden chamber we find a stone chamber substituted, and the beams of the roof are of limestone or granite in place of wood. But the continuity of the general form and system is unbroken. The earliest royal tombs are plain pits roofed in, as in the prehistoric time. By 4650 B.C. a wooden lining forms a complete chamber, with brick cells around it, but no entrance. Under Den-Sefni, 4600 B.C., an entrance stairway is added on the east side. Under Qa, 4500 B.C., the stairway is turned to the north. And the step from this to the usual pyramid form of a north entrance passage sloping down to a chamber, is merely a change of material, but not of form or position. The external form of the mastaba tomb, from which the pyramid was developed (or rather on which the pyramid was super-posed) is exactly that of the rectangular mass of sand above the tomb, held in by the

retaining wall of mud-brick, with a large external batter, as over the tomb of King Zet.

The author, having referred to the favourite lattice-work, the analogue of the mushrabiyyah work of Cairo, went on to trace the course of stone-working. The first actual building of stone is the pit-chamber of King Khasekhemui, in the middle of the Eleventh Dynasty, about 4350 B.C. The limestone courses are tolerably regular, varying one or two inches either way. The faces of the blocks follow natural cleavages as far as possible; but most of the faces are hammer-dressed, and then adzed over to level them. The joints have plaster in them, and also spread over the open joints on the face. The same king also worked in grey granite, as two large building-blocks with inscriptions of his have been found at Hierakonpolis and at El Kab. But building in limestone was still rare, and it is probably to the latter half of the Second Dynasty, about 4350-4200 B.C., that must be assigned a series of rough stone pyramids, which stand at El Amrah, Nubi, and El Qula. These are all built of unworked blocks found loose on the desert and cliffs. Each has successive faces of external finish, which have been coated over with added masonry.

The author next described the fine tomb of King Neter-Ket, probably second King of the Third Dynasty, about 4200 B.C.; the great stone pyramid of Saggara, probably of the same date; and the tomb of King Seneferu at Medum (4000 B.C.).

It is important to see clearly how the pyramid structure is derived from the wooden tombs in unbroken succession, as it has by some been derived from the dolmen and chambered burrow. These structures are quite unknown in Egypt; whereas the continuous stages between the prehistoric pit-grave and the greatest and most accurate structure ever built are clearly traceable. Even the preparation for a pyramid remained just the same as for the wooden tombs of the First Dynasty.

The author concluded with some notes on the subject of pillars. The wooden column appears as an octagon in the models found in the First Dynasty, and in the actual pieces he had discovered in the Twelfth Dynasty, and the copies of such in stone at Beni Hasan. The fluted wooden column is found copied in ivory in the First Dynasty tombs, and is well figured as a hieroglyph in the Fourth Dynasty. The most peculiar form of column is that derived from the tent-pole. This was the origin of the strange form known as the inverted bell capital in the Eighteenth Dynasty at Karnak.

The earliest example known of the lotus column is of the Fifth Dynasty (about 3600 B.C.). The later examples of the Twelfth Dynasty, of the Eighteenth Dynasty, and of the Nineteenth and Twentieth Dynasties, show only a series of lamentable decadence. Each age in Egypt had its special excellence. In the Eighteenth Dynasty a delicate and freely flowing ornamental treatment; in the Fifth Dynasty the finest figure sculpture; in the Fourth Dynasty the grandest constructions; and in the First Dynasty the most lavish use of hard stones for hand objects and table furniture. Doric, porphy, and such materials were cut in thin and beautiful forms with a familiarity which was never known in later times. But every branch of art, when once it had fully grown, decayed rapidly, and the later work in every respect cannot bear comparison with the older triumphs.

Professor Aitchison asked to be allowed to propose a vote of thanks to Professor Petrie for his most interesting paper and for the extraordinary information he had given them about the form Egyptian architecture ultimately took, and how it was entirely a matter of construction. It was unnecessary to say anything about Professor Petrie's discoveries in Egypt, because they were so well known to the whole of England.

Sir L. Alma-Tadema, in seconding the motion, said that Egyptian architecture was like Egyptian civilisation—they always seemed like things which came full-grown into the world. He felt that for so many years that he could hardly admit the truth to himself. The question of the development of that civilisation had been studied, and they all knew, by Professor Petrie specially, and they knew to that civilisation they owed a great architecture and many other things besides. In dealing with Egyptian civilisation, there was the question of time to be considered. They spoke of 6,000 years, and it seemed so

tremendously long that they sometimes felt it was beyond the reach of humanity. But, after all, 6,000 years was only 100 generations of sixty years, and if they began to think like that they would begin to feel with Professor Petrie that the Egyptians were very much akin to them; and to feel so much more interested in that civilisation, which was so essentially human in its development. They had to thank Professor Petrie that night for lifting up a corner of the mystery which covered that great race, that great civilisation, and that great beginning of human development.

Sir Martin Conway said he could only echo the words that had been used in praise of the paper that they had heard and the immense amount of suggestiveness which it contained. He confessed that as he watched the slides upon the screen and listened to what Professor Petrie said, it occurred to him how very strong an illustration he had shown them of one very interesting fact which he thought might be observed throughout the whole history of architecture, and that was how frequently in architecture styles had arisen from the exact contrary to the statement made by Mr. Ruskin. He meant the imitation in one material of forms devised for another. He rather thought it was one of the axioms of Mr. Ruskin that nobody should ever do any such thing as to imitate in one material decorations which were prepared for another. But in the history of architecture he believed it had always been the case. Styles had been developed by doing the very thing deprecated by Mr. Ruskin. In the earliest form of architecture, which they had now had revealed to them, they had the very beginnings of stone architecture—or, at any rate, of the decorative forms used in the earlier stone architecture—derived by direct imitation from the old forms developed when the materials of building were not stone. And just as that occurred then, so it occurred in Greece when stone architecture arose, by the imitation of the forms devised for wooden architecture. He thought they might take the lesson to themselves in the present day, because they were living in an epoch when exactly the same thing was taking place. They saw the metal construction coming in and about to become the dominant constructive feature in all the architecture of the world. He noticed the other day in New York—and he supposed every one had noticed it—that in the great buildings which were really metal buildings faced with other material, the architectural forms were all imitations of those forms which were devised as decorations or even as structural features in old stone buildings. So in the present day they saw going on exactly the same architectural process of development which had been illustrated that night in the extraordinarily interesting beginnings of architectural art described by Professor Petrie. He could only say how fortunate they were to have in Egypt a representative of this country capable not merely of making, as Professor Petrie made, such admirable investigations and of bringing to bear upon newly-opened soil such a bright and intelligent and quickly comprehensive eye, but who was also able and willing almost immediately to reveal them to those at home. He did not, as did so many investigators, keep back his discoveries in his pocket for years and dribble them out in monographs which nobody saw, but came and gave them the immediate benefit of the discoveries which his ability had enabled him to make.

Dr. Murray said he would like to ask Professor Petrie a question which arose from the columns shown on the screen always narrowing towards the top. They would remember that in the frescoes which had been found in Crete the columns widened towards the top, as in the case also of the sculptured column at Mycenæ. He would like to hear whether Professor Petrie had formed any opinion on that subject. Another question that occurred to him was when the lecturer was speaking of those primitive buildings of maize, bound together, from which people built their houses; he was reminded of the passage in the Odyssey where Ulysses described how he built a bridal chamber for Penelope. It was said that he built a stone wall round a living tree and roofed it in. If, as he supposed, a living tree growing in a court was adapted by Ulysses as the supporting element for a room that he built, it would be something analogous to that habit of using natural bodies like maize and so on for the houses in which the people lived.

Mr. R. Phené Spiers said there were one or two questions he would like to ask—relative to those masses of brickwork in curved forms. He would be glad to know whether there was any truth in the first theory put forward that the curved form of those masses was due to the fear of their being shaken down by earthquakes. That theory was put forward twenty-five years ago as a reason for the mode of construction, and they could readily understand that an earthquake would have less effect on a mass built together and leaning one towards another than it would on a vertical wall. Of course, if that was the case, then building in those blocks of brickwork at intervals with those curved lines would give a very solid support, and intermediate lines would tie them together and make them very strong. There was another point he would like to refer to, and that was as to the covering over of that chamber where the roof was a 20-ft. span. He did not quite gather whether it was 20 ft. long or 20-ft. span.

Dr. Petrie: Twenty-foot span.

Mr. Spiers said he had always understood that no timber longer than 17 ft. had been found in Egypt. At the same time there was no doubt that it was the custom to cover over tombs with timber, because there were a number of tombs round about the Pyramids in which the roofs were carved in stone in imitation of earlier ones so that the covering over of houses or of tombs in earlier periods with timber must certainly have been a well-known and recognised custom. He would like to learn what kind of wood it was that was used, because, with the exception of the palm tree, which was not a very strong wood when laid horizontally, it was difficult to understand how so great a dimension as 20 ft. could be covered over by timber, especially if it had to carry 3 ft. 6 in. of sand above it, which must be a tremendous dead weight. Professor Petrie had made discoveries of a remarkable kind, and had set at rest many of the questions which had perplexed the antiquaries of the last century. There was one point which it seemed almost impossible to get people to recognise, and that was the true form of the openings of the doorways. In almost every book they would see it remarked that the doorways in Egypt were always wider at the bottom than at the top; but if one thought for a moment that they were building not with timber but only in crude brick, that would be impossible because the wall would fall over. The only reason he could imagine for the idea was that seen in perspective the batter of the wall came a little more forward, and it made it appear as if the opening in the bottom was wider. There had been much new matter that Professor Petrie had brought before them that evening, and they owed him a great debt of gratitude for having delivered such a delightful and absorbing discourse, full of most interesting facts to all architects. There was one other question he would like to ask, which was whether the fluted columns were shown correctly with hollow fluting.

Professor Petrie replied that they were; they were both flat-sided and curved.

Mr. Stannus said that looking back at the authors who had written on Egyptian subjects, it was interesting to observe that there was a certain analogy between the Egyptian remains and the various crusts of the earth. They remembered that when man in his savage times began to make use of the crust of the earth he could only deal with the tertiary strata of clay. Then later, when he got advanced in civilisation, he was able to deal with the stone and the coal of the secondary strata, and later still, further advancing, he was able to deal with the primary or the metal strata. So it appeared that there was an analogy in that, in the study of the Egyptian discoveries. Reading in the old books they saw that the great idea of Egyptian art was that of the eighteenth and nineteenth dynasties—art which was in a state of effete degradation and debasement was thought to be Egyptian art. Then there came a time when man was able to go further back in the eleventh and twelfth dynasties, and later, since then they had been able to get at the art of the Pyramid builders, and going still further back down to the primary strata, Dr. Petrie had taken them to the art of the first dynasty, and to the art of dynasties even before the first one. They must indeed congratulate themselves that they lived in such times, to have heard all that laid bare to demonstration, and while one congratulated Professor Petrie upon having made such wonderful discoveries

in the fulness of time, there was a certain condolece one might make with him that there was left no more worlds to conquer. It seemed to him that Professor Petrie had almost struck bedrock in Egyptian matters, and that unless he struck another vein his occupation, so far as excavations were concerned, would be gone. Sir Martin Conway was speaking about Dr. Petrie finding things in virgin soil; he thought that Professor Petrie would tell them that it was by no means virgin soil, but that it was ground which had been pretty well picked and hacked over before he had a chance of going over it, and the marvellous things he had discovered just showed the difference between a man who examined them with his eyes open and the man who examined them with closed eyes.

The President said he was sure that they felt, as he did, the very greatest gratitude to Professor Petrie for having given them such a very splendid testimony to his research and careful discrimination in working at the origin of Egyptian architecture. To him it was a revelation, and probably to most of them, unless they had made a particular study of Egypt. He had often, in looking at Egyptian columns, wondered where they got the forms from, and he thought the paper which had been read showed that art was indigenous in Egypt, and grew up with the country. The idea that art in Egypt appeared in full bloom, as Sir L. Alma-Tadema had said, had always added a great charm of mystery to it, and only about ten years ago he believed that people talked of travelling to Arabia to try and find out where the origin of Egyptian architecture took place. But the dream of their childhood and the mystery vanished when men like Professor Petrie looked into the origin of things, and found out what actually was the state of affairs. There was one little point which astonished him, and that was the tremendous length of time to which Professor Petrie went back. They were led to believe years ago that the great Pyramid was built about 2000 years B.C., and now, apparently, it was 3800 B.C. They now talked of discoveries of 6000 B.C., which, according to their lessons in childhood, was before the world began.

The resolution having been carried,

Professor Petrie said that, with regard to the question of art being indigenous, that was a difficult matter. The construction was indigenous, but with regard to art that was another question, and he would have the opportunity of showing there were at least two different arts, and these derived from different sources. With regard to the question of the columns which Dr. Murray mentioned, they must have an illustration of the natural materials used in Greece to explain them. He had no doubt but that the origin of them might be found in the materials used. None, however, had yet brought forward an explanation, and it was useless for him to attempt from Egyptian materials to suggest any material which gave form to another country. The other question of the use of the growing tree in construction was particularly applicable in a woody country such as Greece. Unfortunately, in Egypt wood was comparatively scarce, and as to the question of the nature of the wood, he thought it most likely the wood was not Egyptian at all. He thought it was very probably cedar, but the floor beams were probably acacia grown in that country. The large trunks probably came from Assyria, for they knew at that time there was considerable communication as far as Greece, and the gold which had been found was distinctly from Asia Minor. There was no difficulty, especially in view of the large ships which were by them employed, in supposing that the timber was brought down from the woody parts of Assyria. With regard to the beams, there were beams of greater length than 17 ft. 6 in. remaining. He did not think they need be afraid of the load of 3 ft. 6 in. of sand, for if the beams were laid side by side 33 ft. of sand would be the breaking strain. As to the batter of the walls, he knew there was a suggestion that they would be stronger in view of earthquakes, but he did not think that suggestion solved the question.

NEXT MEETING.

The President announced that the next meeting would be held on Monday, June 3, to receive the report of the scrutineers for the annual election.

BRITISH PATENTS AND THE PROPOSED RESEARCH AS TO THEIR NOVELTY.

THE Committee appointed in May of last year by the Board of Trade to inquire into the working of our Patent Acts of 1883 and 1888 in respect of certain specified questions have issued their Report. The Report sets forth that an examination has been made by the Comptroller and his staff with the purpose of ascertaining the approximate number of inventions for which applications are filed in London that are obviously old, or that, as the official records could demonstrate, have been previously protected under letters patent in England. In the result it is found that an aggregate of upwards of 42 per cent. of the "accepted" specifications appear to have been anticipated either in whole or in part; the detailed figures for one hundred inventions being 57.50 per cent. not anticipated, 6.69 per cent. wholly covered by previous patents, 35.31 per cent. partly novel, 0.29 per cent. obviously old—a phrase of the Committee which the Patent Office construe as meaning known in the industry, but not previously protected—and 0.12 per cent. of which the mode or process of manufacture is not stated or indicated. These figures are calculated upon the basis of "completed" specifications taken and passed during the first week of June in the interval of 1877-1899. The Committee represent that the grant of invalid patents is a serious evil, and are of opinion that in the interests of legitimate trade, and of honest traders and inventors, some inquiry as to anticipation by prior letters patent ought to be undertaken at the Patent Office for discovering whether any invention claimed in a deposited specification has been claimed or described in any, and what, specifications of letters patent granted within the United Kingdom dated less than fifty years before the date of the application. From that inquiry, however, they exclude published "provisional" specifications that have not been followed up to their "complete" stage. They recommend further that an Act or Special Order should be passed to declare that the publication of an invention in specifications of letters patent granted within this country, dated fifty years or longer before the date of the application, or in a provisional specification of any date of the kind mentioned, shall not in itself be deemed to be an "anticipation" of the invention under review. They recommend, too, that the applicant shall be officially informed of the result of the inquiry that is made, upon those conditions, into the novelty, or otherwise, of his application, and that the Comptroller shall decide whether a reference to any, and if so what, prior specifications ought to be made by the applicant in his specification by way of notice to the public, with a right of appeal from such decision to the Law Officer. Inasmuch as the Committee's views, if adopted, will involve a considerable reduction of the annual surplus derived from fees, and also render necessary an increase of the executive staff, they propose that additional expert officers should be appointed in order to carry out their scheme, and that the fee due upon the sealing of letters patent should be raised to the extent of 1*l.* more. A tabulated statement in the Report gives the estimated additional charges upon the income of the Patent Office which would follow upon the new procedure. It is calculated that in the financial years 1902-3, 1907-8, and 1912-3, the net diminution of income would amount to, say, 8,631*l.*, 15,230*l.*, and 23,404*l.*, respectively, since the losses of revenue arising from the consequent decrease of renewal fees would amount, approximately, to the several sums of 15,000*l.*, 24,000*l.*, and 28,000*l.*; and the increased administrative expenses to 36,831*l.*, 53,230*l.*, and 65,404*l.*, in those financial years, respectively, whilst the surplus would be diminished from 117,000*l.* for the year 1902-3, to 111,000*l.* for 1907-8, and to 103,000*l.* for 1912-3, after allowance made of about 14,000*l.* derivable from the 1*l.* extra for the issue of sealed letters patent in each instance.

The Committee express their inability to accede to the suggested adoption of some plan for securing the defeasance of a patent that is not being "worked" in this country, in preference to the current altogether unsatisfactory system of compulsory granting of licences. They propose, however, a transfer, under legislative enactment, of jurisdiction in that behalf from the Board of Trade and their expert referees to the High Court of Justice

with the power of awarding costs. The jurisdiction should, they think, arise when it is made to appear that the reasonable requirements of the public in reference to the invention have not been satisfied, by reason of the patentee's refusal or neglect to work or grant licences upon reasonable terms; and they add the patentee's failure to "work" his invention to the existing grounds upon which a compulsory licence may be demanded. They consider, moreover, as the condition of foreign inventors should be ameliorated in favour of applicants under the International Convention for the Protection of Industrial Property, that the term of seven months' priority enjoyed by applicants may be properly extended to twelve months, provided that an application by a foreigner under the Convention is accompanied with a complete specification, and that the concession for the longer time is reciprocally met by a similar provision in favour of British inventors in foreign countries.

The reference to the Committee has a limited purview, and rehearses a disclaimer on the part of the Government of either desire or intention to establish any general system of examination as to the novelty of inventions. Yet there are many who think that, even with the limitation imposed upon their labours, the Committee ought to have more boldly determined the long vexed question as to the jurisdiction of the courts in contested cases of infringement and cognate suits. The judges administer justice, it is true, yet we commonly obtain justice from them at a price. A dishonest infringer with money in his purse is sometimes enabled to defer, if not to ultimately defeat, the equitable claims of an inventor whose resources are exiguous and who thereby loses the harvest of his ingenuity and skill. The time has not yet come—indeed, one can scarcely hope it will ever come—when for the familiar legend *sans garantie du gouvernement* we shall find substituted a warrant which will fortify its fortunate, perhaps fatuous, possessor against the world at large. Until commercial integrity shall have become universal, the issue of absolute indemnities against all comers would, it may justly be maintained, do more harm than good. There would seem to be no very strong evidence of the existence of what may be termed vexatious patents to any great extent. Why, then, some will ask, interpose between the patentee and his folly? He is content to waste his fees, and more than content to be vested with the part of an original inventor and to exhibit his letters patent to his friends; disillusion comes in the end.

Whilst many competent authorities upon patent law hold that the new indicated procedure does not go far enough, it is manifest that the advocated changes will impart quite an altered scope and aim to the functions and administration of the Patent Office. The inventor of to-day buys a protection that may perhaps lead to fortune; it may prove utterly worthless, or draw him into costly litigation. He must not look to the Office for either encouragement or warning, nor can they in his adversity give him redress. In France, and we believe in Belgium and Italy, where no preliminary examination obtains, a grant of letters patent amounts to very little more than a certificate of deposit or registration, with the declaration that no official guarantee as to novelty is conveyed. In Austria Germany, and notably in the United States of America, a search into novelty is undertaken by the State, and letters patent are withheld from an applicant whose claim is found to have been anticipated, even in the shape of a publication that in itself is not a patent. But there remains the question—what constitutes valid "anticipation"? When that controversy arises recourse is had to the courts, with their concurrent delays, disappointments, and expenses. Our technical staff of trained examiners will at times be sorely tried in their efforts to distinguish, albeit non-judicially, between an alleged new invention and what is apparently an invention in anticipation; still, having in view the care which, as the Committee acknowledge, they bestowed upon the academical investigation we have already mentioned, there seems to be small reason to apprehend, as some do, that any serious failure will ensue in that direction. We should remember, too, that in most cases an astute inventor, who applies in *bond fide*, has made, or caused to be made, the previous search which his prudence and his fears alike may dictate. We do not suppose that the

most strenuous champion of free trade will contend for a common right to trade upon men's brains. Invalid patents are illegal monopolies; the safeguard that is needed is protection against unscrupulous persons who apply their cleverness to gaining profit through the necessity or ignorance of others. The fresh powers that will in all likelihood be conferred upon the Comptroller should enable him to frustrate the designs of so-called "inventors" after that kind by placing on record that they are seeking to obtain what lawfully belongs to some one else. All things therefore considered, we think the measures which the Committee advance for adoption may form, at any rate, the basis of advantageous legislation, and tend to promote, though possibly to a less degree than the more sanguine expect, the legitimate claims of those who may fairly look to the State for both security and guidance.

The report is signed by Sir Edward Fry (chairman), Lord Alverstone, Sir W. H. Houldsworth, M.P., Mr. F. J. S. Hopwood (Board of Trade), Mr. S. E. Spring Rice (Treasurer), Mr. J. Fletcher Moulton, K.C., Colonel T. Walter Harding, Mr. E. Carpmal (Institute of Patent Agents), and Mr. Herbert Hughes (Cutlers' Company, Sheffield). The last three gentlemen add qualifying notes to the general statement, and Sir Edward Carson, K.C. (Solicitor-General), was prevented by illness from appending his signature.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND counties district meeting of the members of the Association of Municipal and County Engineers was held in the Guildhall, Oswestry, on Saturday, May 18. The President (Mr. C. H. Lowe, C.E., Hampstead) occupied the chair, and among those present were Messrs. J. Price, Birmingham; A. Greatorex, West Bromwich; H. Richardson, Aston; T. Cole, London (secretary); J. S. Pickering, Nuneaton; G. W. Lacey, Oswestry; J. W. M. Smith, Wrexham; C. L. N. Wilson, Bilston; J. Parker, Hereford; A. T. Davis, Shrewsbury, &c.

The Mayor, in welcoming the members of the Association, said they were naturally proud of their ancient and important history, but they were still more proud of the public spirit and enterprise of their business men. They were the centre of a large agricultural district, and as a corporation had endeavoured by building large and commodious markets to encourage and assist the farmers, so that instead of retreating, as many agricultural towns had done, they were one of the most successful market towns in the United Kingdom. In ten years the rateable value had increased from 31,377l. to 47,939l., and the rates had fallen from 1s. 8d. to 1s. 2d. per half-year.

The Town Clerk (Mr. Parry Jones), Dr. Lewis, Chairman of the Sanitary Committee, and Mr. Smith, Chairman of the Markets Committee, joined in the welcome accorded to the Association.

On the proposition of Mr. A. D. Greatorex, West Bromwich, Mr. J. S. Pickering, of Nuneaton, was re-elected honorary district secretary.

Mr. G. W. Lacey, Borough Engineer and Surveyor, read a paper on Oswestry municipal work and progress. He said the area of the borough was 1,888 acres and the estimated population nearly 10,000. It was an important market centre, drawing large quantities of all kinds of cattle and agricultural produce from within an extensive radius. The municipal buildings, Renaissance in style, faced with Gresshill stone, were erected in 1892 from the design of Mr. Cheers, of Twickenham, with modifications by Mr. T. M. Lockwood, of Chester, the consulting architect to the Council, who superintended the erection of the buildings, which cost 12,000l. The water supply was derived from a gathering ground in the hills of Denbighshire, 5½ miles distant from Oswestry. Prior to the construction of the impounding reservoir there was only a small catch-tank in addition to the service reservoir, so that without proper storage the supply was somewhat precarious in the summer months. The reservoir was formed with an earthen embankment, and the contractor failing to carry out his contract the completion of the work was undertaken by the Corporation. The amount of the tender for the work was 9,341l., but by the time it was completed the cost was 21,866l. It had a capacity of 24,000,000 gallons, which was equal to 117

days' supply at the present rate of consumption. The water was of good quality, but contained peat, which naturally affected the colour, but not its purity or suitability for dietic purposes. The main sewage system was constructed in the year 1867, and all the sewers had self-cleaning gradients. The daily collection of house refuse throughout the town was in operation. The method of disposal was by tipping, but this could not be characterised as satisfactory in these days. The gasworks and electric light works were in the hands of companies, and negotiations with a view to purchasing the latter undertaking last year met with considerable opposition, and the result of the Local Government Board inquiry which was held was against the sanction being granted. The bacterial sewage disposal works were designed and partly carried out by Mr. R. O. Wynne Roberts, and completed under his (Mr. Lacey's) supervision. There were nine primary beds, the surface area of each being 60 ft. by 60 ft., and nine secondary beds, each with a surface area of 60 ft. by 50 ft., and they were constructed partly in the natural ground and partly by earthen embankments, which were 11 ft. wide at the bottom and 2 ft. 6 in. wide at the top. In the secondary bed embankments clay puddle was put as a security against percolation. On the floors of the beds, lines of 3-in. diameter agricultural pipes a yard apart were laid, connecting with brick channels, which terminated in a small brick chamber in each bed, with the exception of the central ones, where they connected with a channel round the valve chambers. From these brick chambers 9-in. glazed pipes were laid to the valve chambers for discharging the effluents. The beds were filled with cinders which were riddled from an old and large accumulation of house refuse; the gauge of them in the primary beds being from 3 in. to 1½ in., though containing very little of the larger size, and in the secondary from 3 in. to 1 in. The depth of the cinders was 4 ft. 6 in. in each series. In the centre of each series there were automatic valves, which were designed by Mr. Wynne Roberts in conjunction with Mr. Henry Roberts, water inspector, worked by water pressure from the town mains, which distributed the sewage and primary effluent to the various beds in rotation, held up the sewage in contact in the beds, and discharged the effluents in due course. Since the completion of the beds it had been found necessary to put in aeration pipes from the end of the collecting channels to the surface in order to facilitate the discharge and complete the drainage of the contents of the beds, and this had had a beneficial effect. The primary beds had since the commencement of their full use been reduced in capacity by about 30 per cent, but no further decrease had been observed for some time; if anything, since the aeration pipes referred to had been fixed the capacity had increased, and certainly the results had been somewhat better than before. No appreciable decrease had taken place in the capacity of the secondary beds. The sewage first of all passed through one or both of the two settling tanks, 70 ft. by 15 ft. by 4 ft. 6 in., and in these a considerable quantity of sludge precipitated, no chemicals being used. The sewage and primary effluent were distributed over the beds by means of wood troughs, and the final effluent passed away through 12-in. diameter pipes and discharged into a small watercourse. The sludge from the settling tanks was pumped out at intervals of from eight to ten weeks, mixed by machinery with fine screened ashes, and found a ready sale to farmers at 6d. per load. It was not contended that this part of the process was desirable to continue, and some time ago he recommended his Sanitary Committee to consider the advisability of adding septic tanks, and in all probability this would eventually come to pass. The average daily flow of sewage last year was 440,000 gallons, and the dry weather flow 387,000 gallons. This included a considerable quantity of spring or surface water, but, notwithstanding this dilution, the sewage was strong, and contained a considerable proportion of brewery, tannery, and fellmongers' refuse. The occasional analyses made of the effluent from the primary beds went to show that a remarkable proportion of the purification was effected by the first contact. Samples of the effluent which had been kept for longer than a year showed no signs whatever of putrescence, and analyses made during very severe winter weather showed but a slight diminution in the

degree of purification. This diminution was but natural, as when the beds were partially covered with a sheet of frozen snow the admission of air into the beds must of necessity be retarded. But this lessening of aeration was not likely to be of sufficient duration to affect materially the results. The cost of construction of the bacteria beds was slightly over 2,000l., and the cost of maintenance 225l. per annum. The cost of construction was delayed out of revenue sanction to borrow the money not being obtained, as the works did not allow for dealing altogether with six times the normal flow of sewage and for after treatment of the effluent on land. Very extensive provision had been made for markets, and extensions were in progress. The tolls of the whole of the markets last year amounted to 1,765l. Plans for a proposed swimming bath were before the Local Government Board, and a number of public street improvements had been carried out, the cost amounting in the aggregate to a very considerable sum.

Mr. J. Price, Birmingham, in moving a vote of thanks to the author of the paper, referred to the new by-laws under the consideration of the Local Government Board, and said it was as important that the Association of Municipal Engineers should have a say as to what the by-laws should be as the Institute of British Architects. As to refuse collection, the town was well ahead, but when they came to disposal he considered they might adopt some better method than tipping in the vicinity of the town. He suggested that the Council should cremate it, even if they did not get £ s. d. from the cremation in the shape of power.

Mr. A. T. Davis, County Surveyor of Shropshire, said he noticed that from 1891 the population had increased by 1,204, while some 446 houses had been built. Therefore it looked as if the town had been overbuilt, unless there had been a good deal of pulling down of old houses. He knew the tendency on the part of builders to put up houses, and of tenants to remove from the old houses into new houses.

Mr. J. Lobley, Hanley, commended the action of the Corporation in undertaking the working of street improvements, but expressed a fear that in a few years a width of 30 ft. and 36 ft., though a great improvement upon 15 ft. 6 in., would be found insufficient. Where they did not wish to undertake heavy capital liabilities, he suggested that they should prevent matters getting worse by insisting that all the new buildings should be put back to a new building line.

Mr. J. Parker, Hereford, expressed the opinion that there was a great future for the destruction of refuse, apart from the first object of sanitation, for each 1 lb. of refuse would evaporate 1 lb. of water for power purposes.

Mr. A. D. Greatorex, West Bromwich, said with respect to bacteria beds they wanted definite information as to the loss of capacity, and he advised every town to have meters fixed. Judging from the cost of the beds at Oswestry, they had been carried out remarkably cheap.

Mr. J. S. Pickering, Nuneaton, also urged the necessity of measuring the effluent from the beds, either by meter or some other equally accurate means. A mere general statement that the beds decrease in capacity was not sufficient. He thought it would be found in every case without exception that this gradual siltling up was taking place, and sooner or later the necessity of resiltling the material would have to take place. He did not know that there was any serious objection to the use of bacteria beds; but it did affect the question of material very considerably. It used to be thought that coke and ashes were the best material to be used. That idea is now exploded, and it seemed to be recognised that any hard material would answer the purpose. He was using granite for the coarse and probably for the fine beds he was laying down. The advantage of that would be seen when they came to sift the material. In the case of coke it would be a difficult matter, as there would be a good deal of disintegration.

The vote of thanks having been carried, Mr. Lacey, in reply, said the cost of bacteria beds came out at 3s. 6d. per square yard. There was a good deal of truth in what Mr. Davis had said, that the town had overbuilt itself, and the old property was left for the new. Under the by-laws all new streets must be 36 ft. wide. The particular improvement carried out at 30 ft. was because the owner

would not sell more land than sufficient to make a 30-ft. road. He was glad to hear Mr. Parker's advocacy of refuse destruction. He would like to see the Council adopt a destructor, and perhaps the discussion would induce them to reconsider their decision. With reference to the bacteria bed, they had gauged the flow by meter almost from the commencement. He was inclined to be at one with Mr. Pickering as to the material forming the beds. With cinders there was a tendency to disintegrate and become finer. It was all right now, but what it would be in ten or twenty years' time he could not say.

The members then proceeded to view the new fire-station and the market extension, after which they were entertained by the Mayor and Corporation to luncheon at the Wynnstay Arms Hotel. The afternoon was devoted to visits to the filter beds of the Liverpool Corporation Waterworks and to the bacteria beds for the treatment of the sewage of Oswestry.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The eleventh meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, on the 17th inst., Mr. C. H. Strange, chairman of the section, in the chair. The paper of the evening was entitled "A Tour in Mid-France," by Mr. Percy E. Newton.

Starting with Bordeaux, a city under English rule from 1152 to 1453, it was shown what an important bearing this had on English architecture of the period, a succession of skilled workers being brought over from France by Edward I. The more important buildings of Bordeaux were briefly described, mention being made of the splendid carving on the façade of the church of St. Croix. The modern Place des Quinconces was mentioned as a successful treatment of a public promenade.

The route followed from Bordeaux was the course of the Dordogne, a tributary of the Garonne. St. Emilion was the next place visited, and its curious cluster of buildings, formed round the hermitage of the Saint, described. A most interesting place was the next on the list, Montpazier, a town built by Edward I. of England, and practically unchanged to this day. A plan of the town was exhibited, and its remarkable rectangularity of design and the picturesqueness of its arcaded market place commented on. Rocamadour, the great resort of pilgrims in mediæval and in modern times, and its throng of the faithful moulting the hundreds of steps to the shrine; Souillac, with its great abbey church so mosque-like in character; and the fine fifteenth-century church of St. Géraud at Aurillac were then touched on by the lecturer, who then took his audience through the hilly district of the Cantal to Le Payen Velay, in many respects the most picturesque town in France. Mention was made of its numerous peaks, each crowned by a building or a statue, and of the cathedral of Notre Dame, unrivalled in its situation and approach. Mende and its cathedral were next described, and then a voyage down the Tarn, flowing through gorges 2,000 ft. deep—a country interesting to the admirers of Robert Louis Stevenson, his "Travels with a Donkey" being in this district. Albi was the next town visited, and its unique fortress-church, of which a very complete set of photographs was shown, was described, as well as its marvellous choir screen, one of the glories of Gothic art. The last place on the list was Toulouse, where is the cathedral church of St. Etienne, with its beautiful stained glass and strange disregard of axial lines; the church of the Jacobins, a rare example of a church with a central range of columns; and the important church of St. Sernin, the central tower of which may have served to suggest to Sir Christopher Wren his design for the steeple of St. Bride's—these, with some of the fine old houses of Toulouse, were rapidly passed under review by the lecturer, who concluded by saying that his paper would have fulfilled one useful object if it persuaded any of his hearers to pay a visit to this part of France.

Mr. H. C. Corlette proposed a vote of thanks to the author for his paper. He referred to the church at Albi, and mentioned that the present turrets were introduced by Viollet-le-Duc.

Mr. Cuthbert Harding seconded, and the

discussion was continued by Messrs. G. H. Smith, C. H. Brodie, R. H. Weymouth, and C. H. Strange.

Mr. Newton responded, and in answer to queries put to him as to the best month for a cycle tour in the district described in the paper, gave preference to September, although he considered March or October favourable for touring.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Hampstead Borough Council 1,000l. towards the purchase of Dollis Hill estate; Westminster City Council 11,660l. for street improvements and other works; Battersea Borough Council, 1,410l. for public library purposes; Hampstead Borough Council, 17,251l. for electric lighting purposes; School Board for London, 200,000l. for schools; Central London Sick Asylum Board, 3,390l. for erection of asylum; Fulham Guardians, 111,875l. for purchase of property and conversion of premises into a receiving house for children; Poplar Guardians, 15,900l. for site for officers' quarters and engineering works at workhouse, &c.; St. Olave's Guardians, 18,225l. for erection of workhouse and chapels; and Woolwich Guardians, 15,000l. for erection of homes for children.

List of Rates of Wages and Hours of Labour.—The same committee reported as follows:—

"The Electrical Trades Union have called our attention to the fact that the rate of wages for wiremen in the Council's list, viz., 8½d. to 9½d. per hour, is not that in practice obtained, and they have asked that the rate may be increased to 9½d. per hour. After careful inquiry, we have come to the conclusion that the Council's list of wages and hours should be so amended. We recommend that the rate of wages inserted in the Council's list of rates of wages and hours of labour as payable to wiremen be amended, and that the rate be increased to 9½d. per hour.

This was agreed to.

London County Council Central School of Arts and Crafts.—The Technical Education Board reported as follows, the recommendation being agreed to:—"For some years past we have been seeking suitable premises for its permanent accommodation of the London County Council Central School of Arts and Crafts, at present housed in premises held on a half-yearly tenancy at No. 316, Regent-street, and additional premises held on a three years' agreement at No. 314, Regent-street. . . . Our attention has been called to the premises lately acquired by the Council at the corner of Southampton-row and Orange-street, in connexion with that street improvement. The Council is now in possession of a cleared site at this spot admirably adapted for the erection of a building which will accommodate all the work at present carried on in the London County Council Central School of Arts and Crafts, together with instruction in certain other artistic industries, and will also provide accommodation for the London County Council School of Photo-Engraving and Lithography in the event of that school being unable to continue the tenancy of its present premises after the termination of the existing agreement. . . . We have not yet considered in detail the plan of the building to be erected, but the cost of a suitable building on this site may be estimated at about 60,000l., some part of which, if not the whole, we shall be able to provide out of the sum placed at our disposal by the Council under the head of 'new institutions.' . . . The site in question has a frontage of about 89 ft. to Southampton-row, of about 100 ft. to Orange-street, with a total area of about 11,000 square feet. We recommend that the estimate of 45,000l., submitted by the Finance Committee be approved, and that the site in question be appropriated for the purposes of technical instruction within the provisions of the Technical Instruction Acts, and that the estimated value—namely, 45,000l.—be refunded to the Council by the Technical Board by annual payments extending over six years."

Lifts for Greenwich Tunnel.—The Bridges Committee recommended:—"That the supplemental estimate of 6,000l., submitted by the Finance Committee for supplying and fixing

single lifts in the shafts of the Greenwich foot-tunnel, be approved, that tenders be invited for the erection of the lifts, and that advertisements be issued in the usual journals."

This was agreed to.

Brickmaking on the Norbury Estate.—The Housing of the Working Classes Committee reported as follows, the recommendation being agreed to:—

"The Council in purchasing the Norbury estate purchased also the brickmaking plant which was already thereon, and which had been used by the vendor of the estate in the making of over two million bricks. The estate comprises a large quantity of brick-earth, and as this earth exists just where the land rises and will require levelling, every consideration points to the advisability of our making the best possible use of it. We have, therefore, given the question our careful consideration, and have come to the conclusion that it is desirable that the Council should have bricks made for use in the erection of cottages on the estate. In order that this may be done, we are of opinion that the Council should advertise for a contractor who will undertake the making of the bricks at a fixed price per thousand. It should be mentioned that, on the acceptance of a tender, bricks of a sufficiently good quality would be taken from the contractor as required, and the money necessary for this to be done will be provided in the votes which the Council will pass from time to time for the erection of the cottages. The system which we propose will, therefore, not commit the Council to any expenditure at the present moment other than it already contemplates. Moreover, a considerable saving in the cost of the cottages is anticipated from the adoption of this course. A further consideration, however, arises, and this is in connexion with the standing orders of the Council with regard to rates of work done in brickmaking is done by piecework, and paid for accordingly. The rates paid vary according to the locality in which the work is done and the quality of the brick made, and there does not appear to be any trade union regulating either the rates of pay or the number of hours to be worked. In these circumstances it will be necessary for the Council to fix minimum rates of pay for each kind of work, and a maximum number of hours which shall be worked per week. We have made due inquiry and have ascertained that a maximum of sixty hours per week would be reasonable. We have, also after inquiry, ascertained rates of pay for the various descriptions of work to be performed, which we think the Council may adopt as being fair in the trade. We recommend—

(a) That the following rates of pay and hours of labour be fixed as the minimum rates and maximum hours to be observed by any contractor in the making of bricks on the Norbury estate, and that such rates and hours be inserted in any contract for the purpose—

For hand-made clamp-burnt bricks—		
Description of Work.	Minimum Rate of Pay.	Rate of Work.
Digging	4½d. per cubic yard.	
Soiling	3d. per thousand bricks.	
Sharing out	7d.	" "
Moulding, &c.	6s. 6d.	" "
Skintling	5d.	" "
Setting	2s. 3d.	" "
Daywork	6½d. per hour.	
Engine-driver	8d. per hour.	

For wire-cut machine-made bricks—		
Description of Work.	Minimum Rate of Pay.	Rate of Work.
Pit men	1s. 8d. per thousand bricks.	
Cutting off	1s.	" "
Running out	1s. 6d.	" "
Skintling	3d.	" "
Setting in kiln	1s. 10d.	" "
Drawing from kiln	1s. 3d.	" "
Engine-driver	2s. per week.	

Maximum number of hours to be worked per week under either Schedule A or Schedule B, 60 hours.

(b) That the Housing of the Working Classes Committee be authorised to invite tenders for prices for the making of such bricks as the Council may require in connexion with the development of the Norbury estate."

Additional Accommodation Farnfield Asylum.—The Inebriates' Acts Committee reported that they had had under consideration the following tenders for the construction of additional buildings for female inebriates at Farnfield:—

R. Wallace	£29,571	11	6
Foster Bros.	24,579	0	0
Samuel Redwood	24,191	0	0
Herbert Hutchinson	26,200	0	0
Martin, Wells, & Co.	10,799	0	0
J. Cracknell	19,032	0	0
R. Cook & Sons	18,625	0	0
Potter Bros.	18,560	0	0

Modified and accepted at 17,660l.

The tender of Messrs. Potter Bros. was accepted at 17,600l.

Improvements.—The following recommendations of the Improvements Committee were agreed to:—

"That the amount of the Council's contribution in respect of the widening of Fulham Palace-road, between Bishop's Park-road and St James's Home, undertaken by the Council of the Metropolitan Borough of Fulham, be 982l."

"That the amount of the Council's contribution in respect of the widening of Fulham Palace-road, between Fulham Cemetery and Lygon's Almshouses, undertaken by the Council of the Metropolitan Borough of Fulham, be 200l."

"That the amount of the Council's contribution to the Council of the Metropolitan Borough of Stoke Newington, in respect of the widening of Church-street at the Three Crowns public-house and at Nos. 2, 4, 6, and 8, Church-street, be 4,025l."

Sewer Works.—The following recommendations of the Main Drainage Committee were agreed to:—

"That the expenditure of 1,950l be sanctioned for the execution of repairs to the Islington branch of the London Bridge sewer between Liverpool-road and Canonbury-road, and that the work be carried out by the Works Department as a jobbing work."

"That the expenditure of 1,170l be sanctioned for the execution of repairs to the St. John-street sewer between Northampton-street and Albemarle-street, and that the work be carried out by the Works Department as a jobbing work."

House Refuse.—The Public Health Committee recommended, and it was agreed—

"(a) That by-law No. 7 made by the Council under Section 10 (2) of the Public Health (London) Act, 1891, should be amended so as to read as follows:—

"The Sanitary Authority shall cause to be removed not less frequently than twice in every week the house refuse produced on all premises within their district."

"(b) That a copy of the proposed amended by-law be sent to each of the London Sanitary Authorities for their observations in pursuance of Section 114 of the Act."

Theatres, &c.—The Theatres and Music Halls Committee recommended—

"That Messrs. Runtz and Co. be informed that the Council has no objection, so far as its regulations under Section 12 of 41 and 42 Vict., cap. 32, are concerned, to the arrangements shown on the eight plans submitted by them in regard to the Adelphi Theatre."

"That Mr. Matcham be informed that the Council has no objection, so far as its regulations under Section 12 of 41 and 42 Vict., cap. 32, are concerned, to the arrangements shown on the two plans, dated April 26, 1901, submitted by him in regard to the Marlborough Theatre, on condition that the barrier shown at the back of the upper circle be at least 8 ft. high."

Having transacted other business, the Council adjourned until June 18.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Width of Way, Line of Frontage, and Construction of Building.

Walswich †—The placing of a temporary wooden watch-box on the forecourt of Nos 160 and 162, High-street, Eltham (Mr. O. Fleming for the Fire Brigade Committee of the Council).—Consent.

Building for the Supply of Electricity.

Lambeth, North.—An addition to the air-compressor house at the generating station, No. 85, Commercial-road, Lambeth (Mr. W. B. Pinley for the Charing Cross and Strand Electricity Supply Corporation, Limited).—Consent.

Formation of Streets.

Wandswoth.—That an order be issued to Messrs. Marler & Co. sanctioning the formation or laying out of new streets for carriage traffic on the west side of Thrale-road, Streatham, and in connexion therewith the widening of Thrale-road (Col. R. J. Aspinall).—Agreed.

The recommendation marked † is contrary to the views of the Local Authority.

BRITISH EMBASSY, PARIS.—The stables at the British Embassy at Paris are to be newly fitted up by the St. Pancras Iron Company.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The Report of the Society for the year ending April 1901 (the fourteenth annual Report) states that the total number of members at present is 111, as against 109 last year. The Society are hoping to get into more convenient quarters by renting a room from the Literary and Philosophical Society, together with the use of their lecture-hall for six nights in the year. One passage in the Report shows that the Sheffield Society, like some others, has been vainly endeavouring to come to some agreement with the builders in regard to a contract form, and that the negotiations have been rendered useless, in this as in other cases, by the demands of the builders in regard to an arbitration clause. The Report on this point is as follows:—

"It will be remembered that in the last Report the question of the proposed Contract Agreement Form had not been settled owing to the non-adherence on the part of the builders to an informal agreement which had been arrived at with a deputa- tion on August 28, 1899. On April 22, 1900, the following letter was received from Mr. Spink, when the Council unanimously agreed upon the resolution which follows:—

[COPY.]

'53, Broomgrove-road, Sheffield,

April 22, 1900.

DEAR SIR,—In reply to your letter, dated April 11, I am instructed by my Committee to inform you that it is not able to agree to a limited arbitration clause, and further to ask you to allow the matter to stand over for a short time. The Council of the Federation of Building Trade Employers have advised the various Associations that negotiations are about to be made with the architects and surveyors in the federation district for one uniform agreement form.—Yours faithfully,

W. J. SPINK, Sec. M.B.A.

W. C. Fenton, Esq.

[COPY OF RESOLUTION, MAY 16, 1900.]

"That this Council is unable to alter its decision conveyed to Mr. Spink on the 11th ultimo, and regrets that the Master Builders' Association is not prepared to adhere to the agreement arrived at with this Society at their interview on August 28, 1899. Under these circumstances this Council sees no advantage in further continuing negotiations with the Association."

This resolution was followed by a letter on June 13 from Mr. Spink, but the Council considered it inadvisable to reopen the matter. They regret that they have been unable to come to an agreement with the Master Builders' Association on this matter, but the members will see that no time or trouble has been spared by the Council in endeavouring to bring this matter to a satisfactory conclusion."

LIVERPOOL ARCHITECTURAL SOCIETY.—The fifty-third annual report of this Society shows that the Society now numbers 140 members. Among those who read papers during the past session were Mr. Alfred Darbyshire, Mr. Halsey Ricardo, Mr. Baillie Scott, Professor Beresford Pite, Mr. A. W. Paterson, and Mr. Arthur S. Flower. It is hoped that the Society will be incorporated before next session. At the annual meeting Professor Simpson was re-elected President, Mr. Dod Hon. Treasurer, Mr. Dickenson Hon. Librarian, Messrs. Hastwell, Grayson, and G. W. Fraser joint Hon. Secretaries, and the following were elected as the Council:—Messrs. Deacon, Eccles, Hartley, Ould, Strong, Thicknesse, Willink, Hinde, and Thornely.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on the 15th inst., Mr. C. H. Compton, V.P., presiding, "Early Colonisation of Britain by Highly Civilised and Refined Immigrants" formed the subject of a carefully thought-out and original paper by Dr. Phené, F.S.A., V.P. of the Association. The Doctor, who has travelled extensively in the Levant and on the Spanish and Italian shores and islands, has recently been studying and examining some very ancient records which have reference to the early States in and around Etruria in the pre-Roman age. These States contracted with Carthage not to colonise a particular island, the name of which was carefully concealed under an anagram. By tracing the routes of certain tribes mentioned by Julius Cæsar and Diodorus Siculus, he had been able to find corresponding remains of such tribes with identically the same place name in each case, leading towards and into Britain, which all tended to show that the anonymous island was Britain. By a breach of the

contract with Carthage, the island had been so colonised, and enormous wealth had been accumulated of the gold from Ireland and of many valuable products from Britain, leading to the inference that this secretly-conducted commerce had been heard of by Cæsar, who, in consequence, summoned the congress of merchants to ascertain the particulars, hut, failing to obtain the information, through the reticence of the merchants, invaded Britain and returned with "much booty," as related by Strabo. It is an interesting question whether this booty was gold—several classical writers record gold as a British export. The paper was illustrated by several well-drawn charts and plans.—Mr. Allan Ovenden Collard followed with some interesting particulars of the history of the very ancient body of "Free Fishers and Dredgers," of Whitstable, famous for its oysters from Roman times, for it was about the year 80 A.D. that they were first exported to Rome by Julius Agricola. The history of Whitstable is most closely interwoven with its fishermen, who have a history and ancestry reaching far back in the dim past. Some of the family names can be traced back for centuries in the enrolment books preserved by the present Whitstable Fishery Company.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—On Monday evening, May 20, the members of this Institution paid a visit to the works of the Renewable Electric Lamp Company, at Brunswick-place, City-road, London. They were received by the managing director, Mr. H. E. Kershaw. The processes carried on were shown in operation. In addition to the renewing of old lamps by the introduction of a new filament the company are manufacturers of incandescent lamps, the filament being prepared in a special way. Its consumption of current is as low as 27 watts per candle power, and it is guaranteed to burn a thousand hours. In the renewal process, the bulb is reopened, the old filament is detached and a new one inserted, thus avoiding the wastage of the bulb, the cap, the platinum, leading in wires, &c. In the glass-blowing room where the bulbs are expanded, and the filaments inserted, both the Ediswan and the American methods were shown. Entering the mechanical exhausting room, the members saw the system employed for exhausting the bulbs of air, and permanently sealing them; and in the laboratory the filaments were seen in process of manufacture. The flashing of the filaments by being over-run 30 per cent. beyond their nominal candle-power, and the jointing of the platinum filament by electrolysis were shown, as was also the process of jointing the platinum to the copper wire. The apparatus for exhausting by means of the mercury pump was also seen at work. The concluding operations of capping, &c., each lamp having been inspected, the method of testing was fully explained and demonstrated.

THE SURVEYORS' INSTITUTION.

This Institution will visit Southampton on May 30 and 31. The Hartley Council of Southampton has granted the use of the Lecture Hall and other rooms in the Hartley College for the reception and meetings on Thursday, the 30th inst., on which day the following papers will be read and discussed:—"Southampton: Its Past and Present," by Mr. W. Burrough Hill; "The New Forest," by Mr. F. J. Smith (Chairman of the Provincial Committee); "The Liability for Farm Fires caused by Sparks from Railway Engines," by Mr. C. P. Hall; and "Recent Proposals for the Amendment of the Law and Practice as to Ancient Lights," by Mr. P. E. Pilditch.

The Mayor will entertain the members at luncheon in the Pavilion of the Royal Pier at 1.30 p.m., and the members will dine together at the South-Western Hotel at 6.30 p.m. The following day will be devoted to visits to places of local interest.

CONGREGATIONAL CHURCH, HARRINGAY.—The foundation-stone of a new Congregational church has just been laid at Haringay. The new church will contain a chancel and choir, nave, aisles, double transepts, and an end gallery, together with minister's and deacons' vestries. It will be capable of seating some 800 persons. Messrs. D. Church & Sons Finsbury, are the architects.

Illustrations.

RIMINI CATHEDRAL.

THE Church of S. Francesco, now the cathedral, goes by the name of the Tempio Malatestiano. It is an Italian Gothic church of the fourteenth century, with a nave 115 ft. long and 30 ft. broad, three chapels on each side, a choir of one bay, and a semicircular apse. In the first half of the fifteenth century Rimini, like Urbino, was one of the seats of the Early Florentine Renaissance. One of its Dukes, Charles, was a great patron of the Humanists, and tried to attach Ghiberti to his court. Another, Sigismond Pandolfo Malatesta (1428-1468), obtained the assistance of the great scholar and architect, Alberti, and proceeded to transform the inferior Gothic interior of S. Francesco into a magnificent memorial of the wealth and alliances of the Malatesta family, and of the eminent part taken by the reigning Dukes in the revival of classical art and literature. Little is left of the Gothic church except the pointed arches of the nave-arcade and some traceried windows. The façade is unfinished, the intended dome was never built, nor the wooden vault which was to have been where now is a simple open timbered roof. The church was dedicated, with the characteristic Paganism of the day, to the Duke's mistress, "Divæ Isottæ," though it is only fair to add that she afterwards became his wife. As the church was now intended to be the *Malatestorum domus heroidum sepulchrum*, Alberti flanked the nave by seven imposing arches on panelled piers detached from the wall of the church, elevated on a continuous basement, and masking the Gothic windows. Under these arches are placed seven great sarcophagi in the ancient style, in which are deposited the ashes of the great men whom Malatesta had collected around him—poets, orators, philosophers, and soldiers. In the interior are seen everywhere the coats of arms of the Malatestas and their alliances, the most striking cognizances being the rose and the elephant, and the monogram of the united initials of Sigismond and Isotta. There is abundance of classical ornament and emblems, mythological sculptures, and fine bas-reliefs. The walls are covered with very numerous pilasters, large and small, curiously disposed, and with sculptured panels and carved ornament. The rich marbles which ornament the church are largely due to the spoils of other buildings. Alberti commenced his work in 1450. It displays his characteristic scholarship and beauty of proportion and detail, and must have had great influence on the Early Renaissance in Northern and Central Italy. We give illustrations showing the interior of the nave and two of the chapels. An illustration of the exterior, from Gally Knight's "Italian Architecture," appears in Fergusson's "History of Modern Architecture," 3rd edition, vol. i., p. 65.

ST. JOHN, HIGH WYCOMBE.

This church is about to be erected to form the centre of a new district in the rapidly growing town of High Wycombe. It will be situated close to the Aylesbury-road, at the western end of the town, and about half a mile from the old church.

The materials will be local bricks and tiles. The chief characteristics of the plan are the single span nave and the arrangement of the sanctuary and east window. Close to the eastern wall a lofty factory is likely at any time to be erected, and the east window is accordingly set back and elevated over the sacrum arch, a rich redos taking the usual place of the window. In a recent competition among local and other contractors Mr. Flint, of High Wycombe, was successful.

Mr. W. D. Carie is the architect. The drawing is exhibited at the Royal Academy.

S. MARIA DEI MIRACOLI.

The sketch we publish this week is of the doorway in the principal front. The church was built about 1480 by Pietro Lombardo, who also designed some portions of it. It is the most perfect piece of Renaissance architecture in Venice. Very small, it is faced inside and out with marbles of delicate contrast, to which age has lent additional charm, and its propor-

tions are exquisitely marked by the dark colour of the cornices and pilasters.

The church was only opened to the public a few years ago.

S. MARIA DELLA SALUTE.

This church is known to every visitor to Venice as one of the landmarks of the Grand Canal. Though it is not a very remarkable piece of architecture, it possesses the merit of looking well from every point from which it can be seen. It was built in 1631, under the direction of Baldassare Longhena.

The present sketch was taken from the landing steps of one of the hotels on the Grand Canal.

THE INSTITUTE OF BUILDERS' ANNUAL DINNER.

THE annual dinner of the Institute of Builders was held on Wednesday evening at the Trocadero Restaurant, Piccadilly. Mr. Chas. Wall, the President, was in the chair, and among those present were Colonel Stanley G. Bird, Messrs. W. J. Locke (Secretary of the Royal Institute of British Architects), H. J. Moore (Master of the Masons' Company), Basil P. Ellis, S. Bolton, W. Carpenter, G. A. Wall, H. Wall, E. White, L.C.C., F. Wall, A. Boden, W. F. Wallis, F. G. Wallis, R. Preston, M. Sprigg, A. Duffield, J. Bell, F. S. Bywaters, J. Carmichael, A. Ritchie, J.P., F. G. Dove, F. L. Dove, J. D. Greenwood, L.C.C. (past-President), G. Edwards, H. Holloway, W. Hill, T. Hall, H. Smith, A. Dickens, C. O. King, J. W. Garnham, R. S. Henshaw, G. R. Kett, W. T. Tapper, W. F. King, C. King, H. Knight, L. J. Maton, G. Norris, J. Milson, W. Nicholson, A. Dixon, F. A. Nightingale, A. E. Parker, H. A. Heffer, A. Willick, A. B. Jackson, T. W. Farthing, A. Phillips, J. Randall, A. F. Randall, E. S. Rider, E. Strange, W. Shepherd, E. Shepherd, H. P. Shepherd, and A. W. Turnbull.

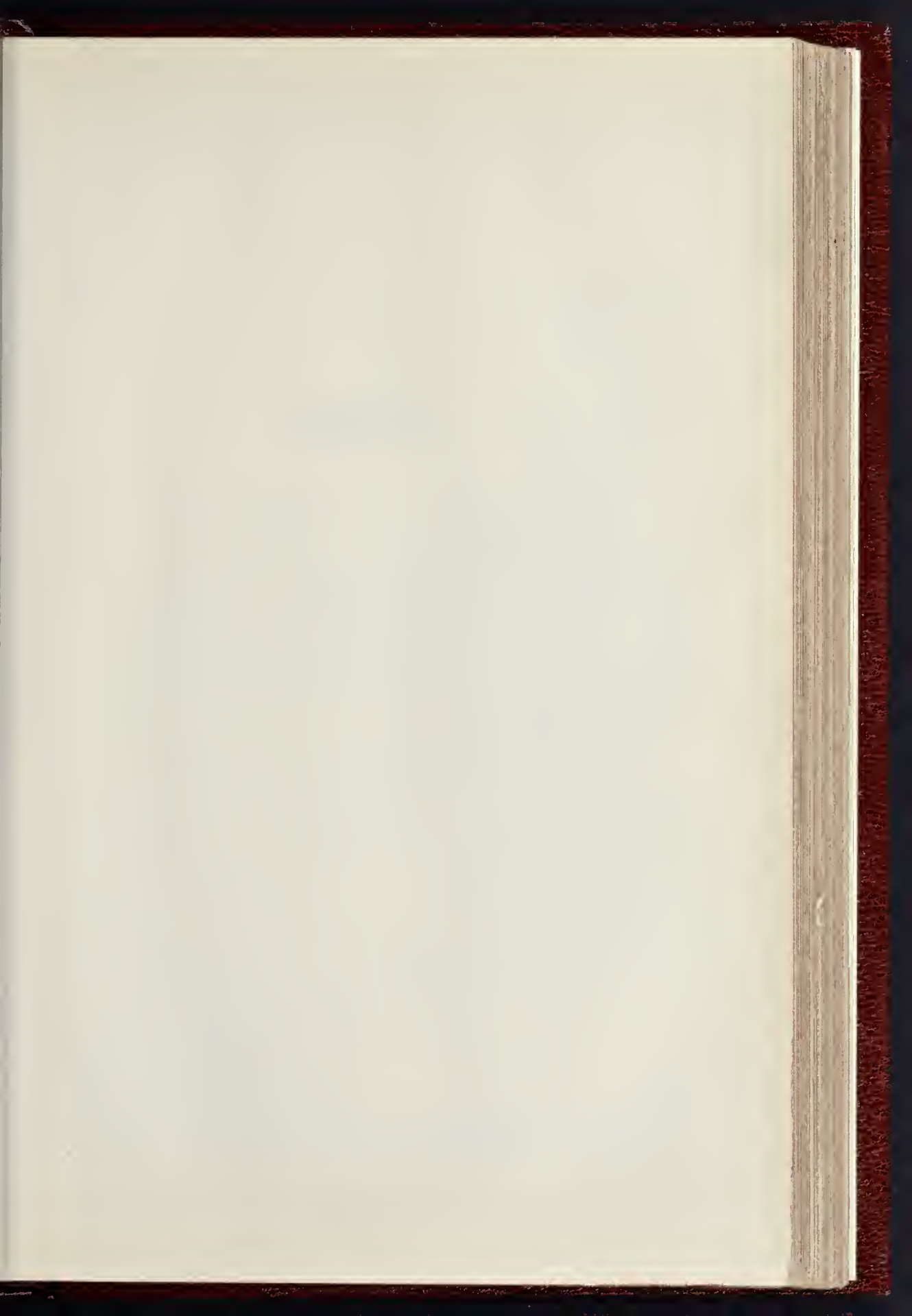
After the loyal and patriotic toasts, Mr. Edward White, L.C.C., submitted "The Institute of Builders and the President." He said he was not able to decide as to whether this toast had been entrusted to him because he belonged to the London County Council—which body had done its best to do without the services of the builders and failed—or whether it was because he was a friend of the President. He was not intimately acquainted with the objects of the Institute, and had thought that, perhaps, among other things, papers might have been read by members to induce working men to give a fair return for their weekly wage, or to put an end to the stupid and onerous conditions in the building contracts of the London County Council. If such papers had not yet been introduced, no doubt they would be in future. The London County Council had spent something like 200,000l. of the ratepayers' money with the avowed object of securing the large profits that flowed into the pockets of the builders. Three years ago they held an inquiry, in the course of which Mr. Holloway, a member of the Institute, gave important evidence. At the time the Works Department of the Council had been in existence five or six years, and the result of their efforts was that after expending the capital and the sum of 20,000l. per annum for maintenance and management they had succeeded in showing a loss on the estimates of 3,000l. That was considered to be a very serious matter, and a special inquiry committee was appointed to endeavour to ascertain the cause and to try to find out whether it could be avoided in the future. They found, according to the last report, that after three years' more trading the Works Department had managed to increase their total loss from 3,000l. to 65,000l. He had called into question all along as to whether it was the wisest policy to endeavour to dispense with builders, but he was like a voice crying in the wilderness—they did not pay any attention to him. He was not prepared to contend that the profits which builders made were not commensurate with the trouble they had and the capital they invested, and he thought the Council and every other public body should carefully consider whether they were able and entitled to dispense with a body of men who were deserving of every consideration, and who were not dishonest, as certain members of the Council had held them up to be. He was glad that master builders had come to the conclusion—and they had been a long time doing so—that their strength lay in combination. They

had had a very important lesson set them by the working men, who had been able to achieve so much by this means. However, by combining they would be able to hold their own against the organisation of labour. The building trade stood in a better position to-day towards the workers than ever before, and their combination would not only be to their own advantage, but for the benefit of the men themselves. There were many members of the London County Council who were altering their opinion with regard to the Council undertaking its own work, and it was quite clear that the jobs undertaken by the best class of builders were more to the interest of the ratepayers and to the Council, because, while the work was turned out in every respect as good as when done by the Works Department, it was carried out very much cheaper. It was a great, important, and far-reaching question, inasmuch as it affected the great housing question. Recent experiments had shown that where the Works Department had been unable to erect buildings within the estimates of the architect, and the work had been given to highly respectable firms of builders, the cost had been well within the estimates. This was of advantage not only to the ratepayers, but to the class of persons who would inhabit these dwellings, because the greater the cost the higher must be the rent.

The President, in reply, urged the advisability of recruiting among the younger members of the building trade to induce them to join this Institute, the aims of which were well worthy of consideration. In these days a builder must be something more than a builder—he must be a surveyor and a lawyer as well, or he must have one at his right hand. In reference to the question of equitable contracts, he mentioned that in stone work the Council wanted it to be measured according to the bulk of displacement which would take place in water, which meant that the more work a builder put into a piece of stone the less he would get for it. An equitable contract was of advantage both to the client and the builder. If a builder felt that he had an equitable contract he could work far more comfortably and with less friction; but if, on the other hand, his contract was most unfair, he was entitled to get over it as soon as possible. It was most unfair to try to harass builders in their work. They had had many difficulties with their men, but, happily, there was a lull now, and he thought that the leaders of the working classes were coming to the conclusion that it was far better to come to terms with the employers than to irritate them. Employers only wanted a fair day's work for a fair day's money, and that was to the advantage of all.

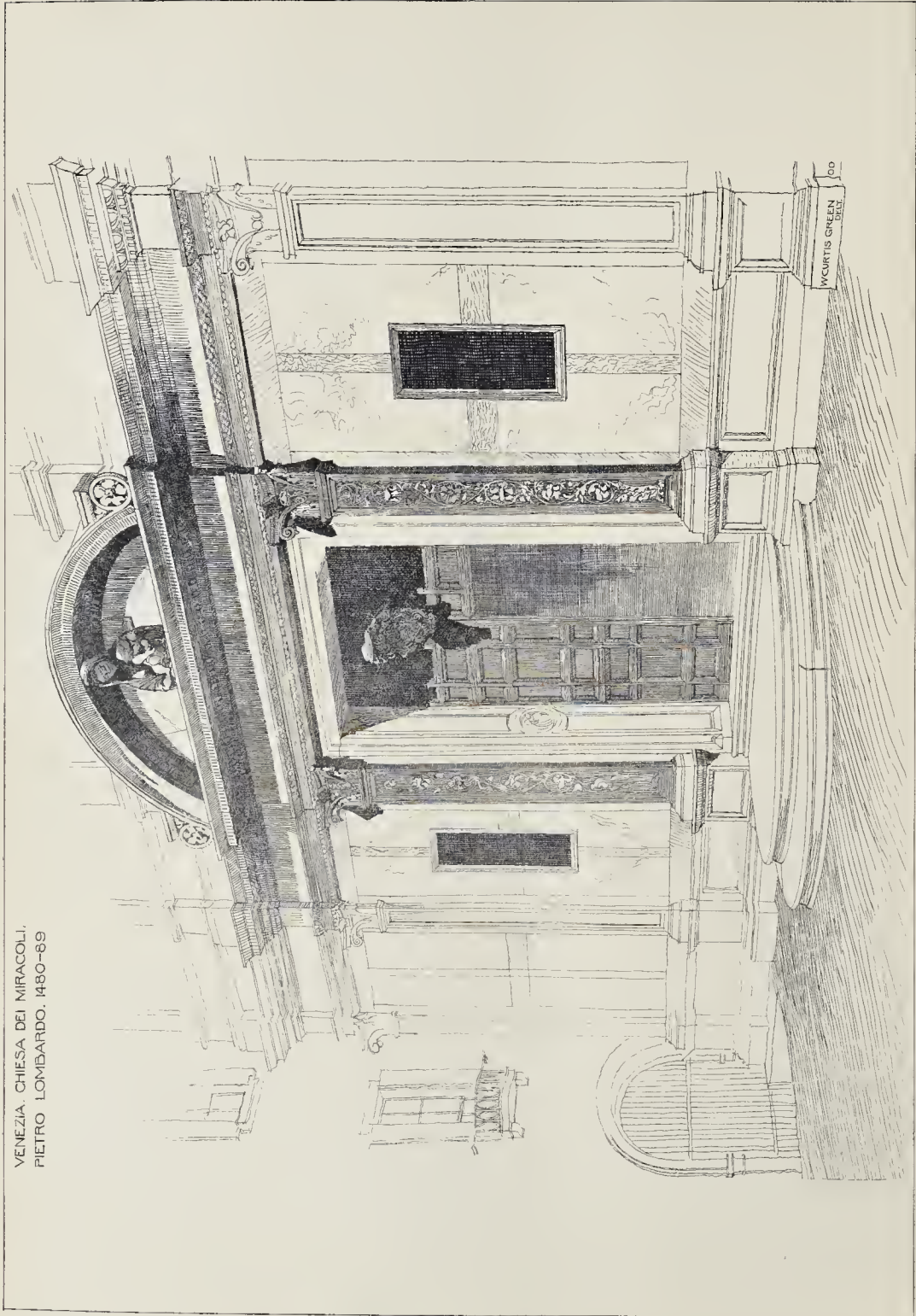
Mr. William Shepherd proposed "The Architects and Surveyors." He believed that at the present time the members of the architectural profession had many more opportunities to distinguish themselves than they ever had had in this country. Those who took an interest in architecture could see by modern buildings which had been erected in our streets great evidence of the highest ability of the members of the profession. With regard to the proposed memorial to the Queen, he regretted very much that there had not been an open competition. It was a pity that the choice was limited to so few architects, and he considered that the principle should have been followed of throwing open the competition to all the members of the profession in the world. No doubt most of the money would be given in the City, and the general opinion there was undoubtedly in favour of an open competition. He hoped that in future the contracts between builders and their clients through their agents, the architects, would be more equitable and fair, and certainly every effort had been made by this Institute to bring about that result. Unfortunately, they had not yet been able to come to an agreement, but they still hoped that it might be possible to frame conditions of agreement between the client and the builder which might be accepted as equitable on all sides. He coupled with the toast the name of Mr. Farthing, a quantity surveyor. Some architects seemed to regard quantity surveyors as a kind of necessary evil, but he looked upon them as forming an essential element in the building industry. He believed that they formed the very best men to adjudicate in disputes or differences which might arise on building contracts.

Mr. Farthing, in reply, referred to the late Queen's Memorial, and said that he thought the competition should be open to English-



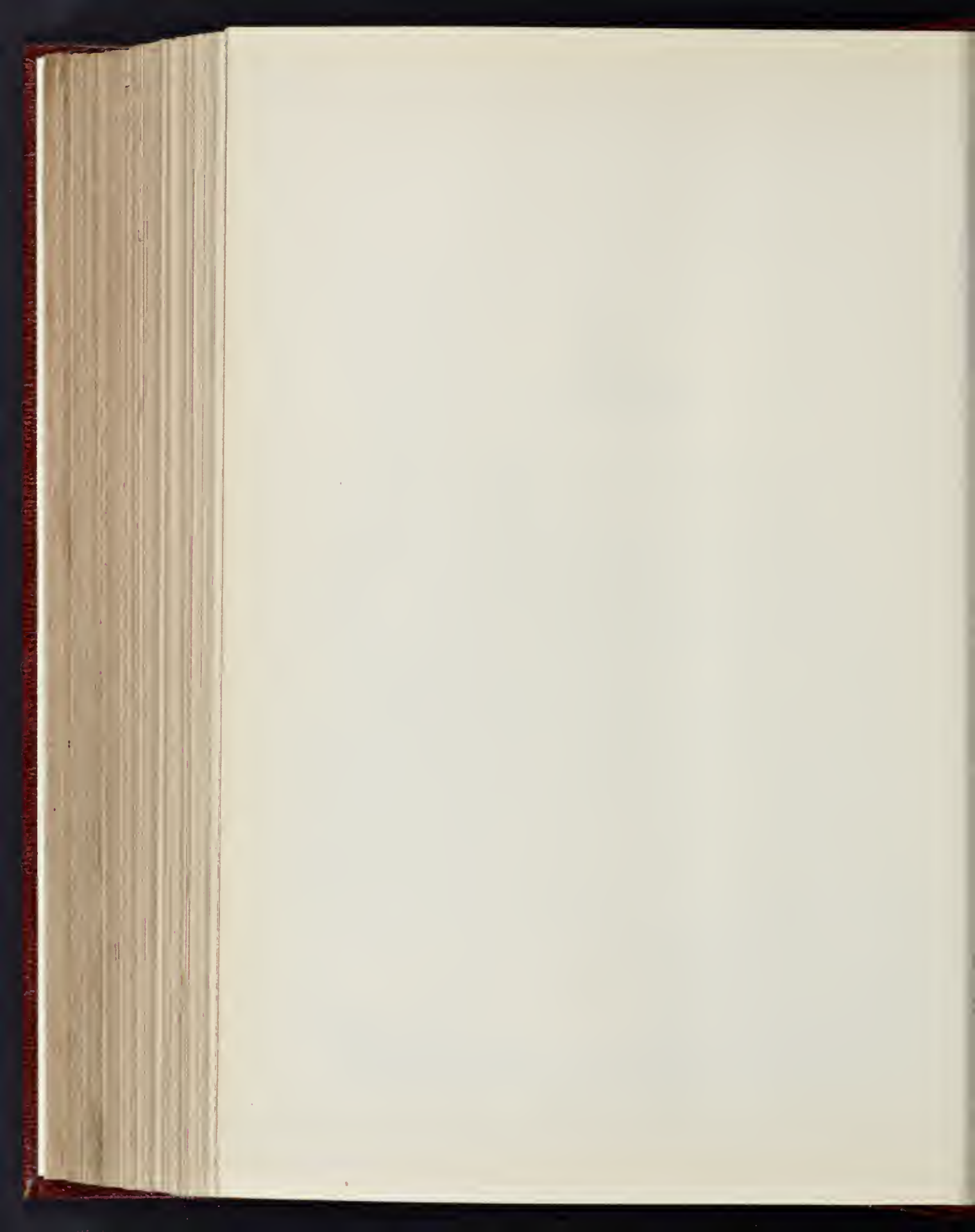
THE BUILDER, MAY 25, 1901.

VENEZIA. CHIESA DEI MIRACOLI.
PIETRO LOMBARDO. 1480-89



SANTA MARIA DELLA
SALUTE: VENICE





men and colonists, but he drew the line at foreigners.

The President then proposed "The Visitors," which was responded to by Mr. Ritchie. This concluded the toast list.

EXPORT TIMBER TRADE OF SWEDEN.

ACCORDING to a report prepared by Mr. MacGregor, British Consul, on the trade of Stockholm and the eastern coast of Sweden, for 1900, the year turned out most successful for both owners of forests and of sawmills. The demands for red-wood, as also for whitewood of the larger dimensions, were good during almost the whole year, so that exporters were enabled to dispose of their stocks easily and at rising prices. The same favourable state of things cannot be said to have existed with regard to battens and the smaller dimensions of wood, for which good prices could not be maintained. Importers in the United Kingdom, as a rule, had not such a profitable year. In order to keep the stocks in hand they had to purchase at artificial prices, and in a number of instances for sales f.o.b. they were obliged to pay the constantly increasing rates of freight that were ruling during the summer and autumn months. These circumstances combined made it difficult to obtain satisfactory results. During the course of the year the stocks offered for sale for first open water showed an increased proportion of smaller dimensions. This is said to be attributable to inefficient management of the forests, and it is supposed that the quotations for the year 1901 will suffer in consequence. At a meeting of the Sawmill and Wood Export Association held a few weeks ago the report presented showed that, although the quantity of sawn timber was less in 1900 than during the four previous years, the export value of the same was undoubtedly the highest known since 1874. Results would have been still better, it is believed, had it not been for the war in South Africa and the troubles in China. The actual quantity exported to South Africa is given as 4,600 standards more than in 1899. It is confidently expected that great quantities of timber will be required to replace numerous buildings destroyed during the war in South Africa, and that the cessation of hostilities there will immediately have a favourable effect upon the Swedish timber trade. The export from Sweden of planks, battens, and boards, planed and unplanned, during the year was 1,009,948 standards, as compared with 1,026,602 in 1899. Of the total, by far the largest proportion, viz., 450,887 standards, was shipped to the United Kingdom.

Mr. Carrick, Vice-Consul at Gelle, states that there the rise in the prices of sawn and planed wood continued until about the middle of 1900, when the difficulty experienced by the importers of the United Kingdom and other consuming countries in obtaining tonnage to remove their goods suddenly arrested further purchases. This dearth of tonnage caused freights on wood and other goods to rise to a higher point than had been reached for the last fifteen years. So much wood had, however, been sold by shippers for first open water and summer delivery prior to the advance in freights, that they were almost independent of the market for the remainder of the shipping season, and little actual fall in price occurred before the close of the navigation. The quantity, viz., 129,326 standards—was only about 6,000 standards less than that for 1899; doubtless, appreciably less than would have been the case had not the scarcity of tonnage intervened. As circumstances now are, sawmill owners and shippers have to carry over to the new season considerable stocks produced under the combined influences of expensive standing wood and dear labour. Mr. Carrick adds that at the time of writing a much smaller proportion of first open water (1901) stocks had been sold than is usually the case, and shippers, by refusing to meet the demands of British and Continental importers for some modification of prices, are running the risk of causing not only stagnation in business, but likewise considerable losses to themselves further on in the season. The unexpected prolongation of the war in South Africa is also hindering the sale of wood goods to that quarter—now a rather important outlet for certain dimensions and qualities.

The quantity of wood shipped from Lulea (writes Mr. Vice-Consul Westerberg) during 1900 showed a considerable decrease, chiefly as regards balks and square timber. A good many buyers, on account of the heavy freights and the scarcity of suitable tonnage, preferred to let the goods they had bought remain in the hands of the seller till another year; not that they opened with somewhat lower values for both red and white wood, and especially for smaller dimensions.

Reviewing the course of the wood trade in Herosand for 1900, Mr. Vice-Consul Burchardt says it is to be regretted that the close of the season has brought some disappointment with it, although on the whole the year was one of high profits for exporters. While the consumption of timber for the previous three years had been steadily increasing, production, especially in Sweden, has remained stationary, or even (where the large dimensions are concerned) been retro-

gressive. Stocks are therefore generally light both in exporters' and importers' hands. Selling was started in October by buyers practically acceding without any serious opposition to the prices demanded by shippers, which represented considerable advances on those that were current a few months previously. The buying fever extended rapidly, and British buyers, in competition with the Continental importers, most effectually assisted Swedish exporters in raising their quotations. After the turn of the year a certain quietness came over the wholesale trade, most exporters having by that time sold as much as they could dispose of early in the year, with all the uncertain elements regarding logging and floating, which exporters must take into consideration when selling summer and autumn goods. After the end of March, however, the current of business began to be seriously checked, owing to the practical absence of tonnage on offer for removing the goods already purchased, although the prices maintained their good position throughout the year in consequence of the small quantities that were unsold in most of the leading stocks. Mr. Burchardt concludes that "the timber export from Sweden has probably yielded to the exporters larger profits than they have had during any previous year. It is to be supposed that the prices have reached their culmination, and a fall during 1901, as regards smaller dimensions, will doubtless take place. The prices of deals, on account of the limited supplies of larger dimensions, may still be expected to stand firm."

THE PRODUCTION AND CONSUMPTION OF ZINC.

MR. ERSKINE, the British Vice-Consul at Chicago, has collected for the Foreign Office a great deal of information as to the zinc industry in the United States and elsewhere. From his report it may be gathered that the approximate yield of zinc ores in the United States for 1900 was about 425,000 tons of 2,000 lbs., of which 125,000 tons were exported to Europe. The weight of zinc products in the whole of Europe and the United States for the year 1900 was 520,000 long tons, as compared with 361,010 long tons in 1890. During the last fifteen years the European production has increased by 38 per cent., and that of the United States by 187 per cent. These figures not only show the extraordinary expansion in the use of zinc in the past few years, but indicate a continued increasing demand in the future. When it is furthermore borne in mind that for commercial purposes zinc was almost unknown a century ago, that until half the nineteenth century had passed its use was infinitesimal, and that its ores were considered a curse to the miners when found with lead and other ores on account of the trouble given in separating one from the other, this expansion is still more an indication of future demands. Some years ago, hundreds of thousands of tons of this ore could be found lying in the deserts both in the Old and New Worlds, and the variety known as "dry bones" has been extensively used for roadmaking in Wisconsin. The United States' production of zinc oxide, nine-tenths of which is got from the ores direct, has increased 467 per cent. since 1880, and its popularity has spread so much that the largest consumers now complain they are unable to get a supply equal to their requirements. About 85 per cent. of this product is used in the manufacture of paint, while the remainder is used for floorcloth, table-baizes, and wallpapers, and enters into the manufactures of indiarubber, earthenware glazing, ointment, and medicine. In seeking the cause for this phenomenal increase in consumption of zinc products for the manufacture of paints, and in examining the statistics of the production of white lead it is found that the newer zinc products are fast taking the place of the lead, or at least that while the zinc products consumed in paint manufacture were in the United States fifteen years ago only one-sixth of the total quantity of lead used, now the zinc is only less by one-half. These figures show the increasing popularity of the new material, for while lead has been used in paint for centuries, zinc is said to have been first used in this way in 1847 by Leclair, a painter in Paris, who recognised its utility and colour. "Zinc paint" (the Vice-Consul writes) "has a beautiful whiteness, is durable, is non-poisonous, gives off no poisonous gases, and has become indispensable, as it enables manufacturers to produce the most delicate tints. It is light and bulky, and in combination with other materials adds value to them. When cleaned and sent to the furnaces, the carbonates and silicates will assay for metal about an average of 38 per cent., and the sulphides average about 55 per cent. In 1894 a 60 per cent. ore went as low in price as 31.14s. 6d. per ton, while, in 1899, the same quality of ore rose to over 10s. and in February, 1901, was about 41. 12s. The very high prices during 1898 and 1899 caused an extraordinary development in zinc mining, with the usual result that what was thought in 1896-97 to be a prospective ore famine was changed to a considerable surplus, and for the last year the mine owners have been facing the problem, especially in the Joplin district in Missouri, of how to operate successfully about 500 mines, when less than half of that number could supply all the furnaces now in blast in the United States, and

arrangements are being made to ship large quantities of ore to Europe. It is reported on all hands that the European mines are well nigh exhausted, and that some of the Continental smelters are to move to the United States in the near future. There are enormous deposits throughout the United States, and while some are very poor many are very productive, and great care has to be taken in investing, as is shown by the recent failure of the International Zinc Company."

BOOKS RECEIVED.

THE PRACTICAL GUIDE TO THE PUBLIC HEALTH ACTS. By T. W. Hime, M.D. (Baillière, Tindal, & Cox.)

JOURNAL OF THE SANITARY INSTITUTE. April 1901. (E. Stanford.)

HOMELAND HANDBOOKS: TEIGNMOUTH. By Beatrix F. Cresswell. (The St. Bride's Press. 6d.)

Correspondence.

To the Editor of THE BUILDER.

QUEEN VICTORIA MEMORIAL.

SIR,—The fine scheme you sketch in your issue of April 13 for a monumental avenue from Marlborough Gate to Buckingham Palace leads me to hope that this unique opportunity for improving St. James's Park may not be missed.

Here is a spot which, at a comparatively small outlay, might be made one of the most beautiful gardens in Europe. At present it has no symmetry, no dignity in the neighbourhood of its surrounding buildings, while internally it is intersected at all angles by ugly footpaths.

Your suggestion, sir, that a direct road should connect Marlborough-gate with Queen Anne's-gate is a good one, and if this road bifurcated immediately it had crossed the ornamental water and swept east and west into Birdcage-walk, the distance cabs would have to travel from Victoria to Pall Mall would not be materially increased, while the Palace precincts would, as you observe, be suitably secluded.

Mr. Bodley's poetic conception of the Victoria Memorial rising out of water would best be realised in connexion with your idea of a combined ornamental canal and monumental avenue.

But why stop here? The Horse Guards Parade is the finest architectural piazza in London. If it could be seen at all from the park it would present a series of the most impressive architectural views we possess, but the ground has been banked up and planted, apparently with the special object of excluding (especially in the summer) all view towards, and of the park itself, from the Parade.

The axis of the Parade happens exactly to intersect the Mall-avenue at Marlborough Gate, which points to a circus at this intersection from which another broad avenue should lead direct through the Horse Guards arch to Whitehall. The park boundary of the Parade should be treated systematically and monumentally with piers and fine wrought-iron gates and railings, as roughly indicated on the sketch plan appended by way of explanation. The triangle thus formed should be open to the Mall and be well laid out in formal flower beds.

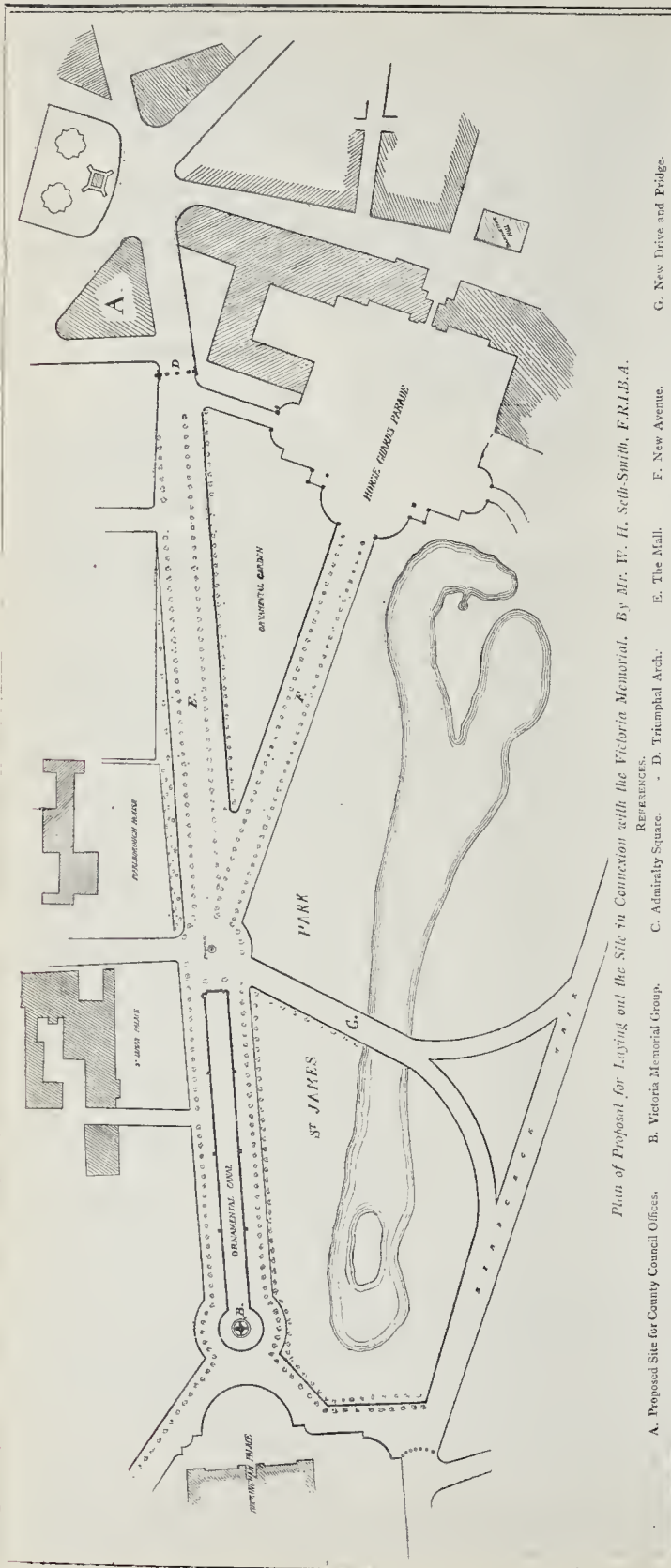
Fortunately there are few trees of any importance on the line of this suggested avenue, and the young planes in the present avenue might easily be moved to improve the width of the Central Mall Avenue.

In this way, views of the ornamental water would be opened out from many points, giving fine foregrounds for the views which this end of the park affords.

A gateway into the park from the Strand would naturally form one of the improvements, and if the large triangular site (which I indicate) facing Trafalgar-square could be negotiated, it would make a worthy one for the housing of our London County Council, and, rightly treated, would be a grand improvement to London architecture.

The laying out of the grounds in detail needs considerable skill. These are merely suggestions for the leading features.

Now, sir, why should not the Government, the London County Council, and the Victoria Memorial Executive Committee work together to accomplish the remodelling of the park belonging to the Royal Palace of the metro-



Plan of Proposal for Laying out the Site in Connection with the Victoria Memorial. By Mr. W. H. Seth Smith, F.R.I.B.A.
 A. Proposed Site for County Council Offices.
 B. Victoria Memorial Group.
 C. Admiralty Square.
 D. Triumphal Arch.
 E. The Mall.
 F. New Avenue.
 G. New Drive and Bridge.

polis of this Empire with a view to marking more effectually the nation's devotion to England's greatest Queen and the improvement of English taste at the opening of the new century?
 W. H. SETH-SMITH.

SCIENCE AND ART DEPARTMENT'S EXAMINATION IN BUILDING CONSTRUCTION.

SIR,—Kindly allow me to supplement Mr. Adam's letter on this subject in your last issue by calling attention to a far more serious aspect of the paper, viz., the large number of instances in which the questions are totally at variance with the Department's own syllabus. This syllabus prescribes very carefully and minutely the various points which the student is expected to study for the several stages; but the syllabus is one thing and the examination—during recent years—quite another.

In the elementary stage, for instance, this year, Questions 1, 3, 8, 9, could only be answered by those who had prepared for the advanced stage. Question 2, by an honours student; and in three other instances "explanations" are required, a thing only required in advanced and honours. From this it will be seen that a student properly prepared according to the syllabus stands no chance of getting full marks.

In the advanced stage, Questions 21, 23, 24, 27, 30, are all clearly for honours students; see Question 43 in honours, which is almost an exact repeat of 24 in the advanced, while the latter half of Question 28 is outside the scope of any stage in this subject.

In Honours I, questions on hot-water heating, electric lighting, and on sanitation are given, but the syllabus is quite silent on these points. As regards the electric lighting question insufficient data are given; no electrician could possibly quote a price under such conditions.

In Honours II, the absurd nature of two questions has already been touched upon by Mr. Adams, but he failed to drive home the grossly unfair character of Question 69, which, in brief, is—design a dwelling, take accurate quantities, and price them. In the first place the syllabus relegates design to the practical stage of the examination; in the second neither quantities nor prices are even mentioned in the syllabus as points to be taken by students. On the question of time allowance, there is here at least a half-day's work for an architect, one day's work for a quantity surveyor, and another half-day's work for a builder's estimator, even when quotations for materials have been got in. Surely it was never intended that quantities and prices should form part of this examination, which is purely one on construction. Question No. 70 is another instance of totally inadequate time being allowed for an answer; it would take an average architect quite two days in the ordinary course of business. In this question a colour decorative scheme is required; but again no mention in the syllabus.

If this year's questions are to be any guide, we may expect in the future to be examined in—legal matters affecting the trade, designs for furniture, pianos, overmantels, stoves, stained glass, paper-hangings, and laying out gardens, as they are all more or less connected with buildings.

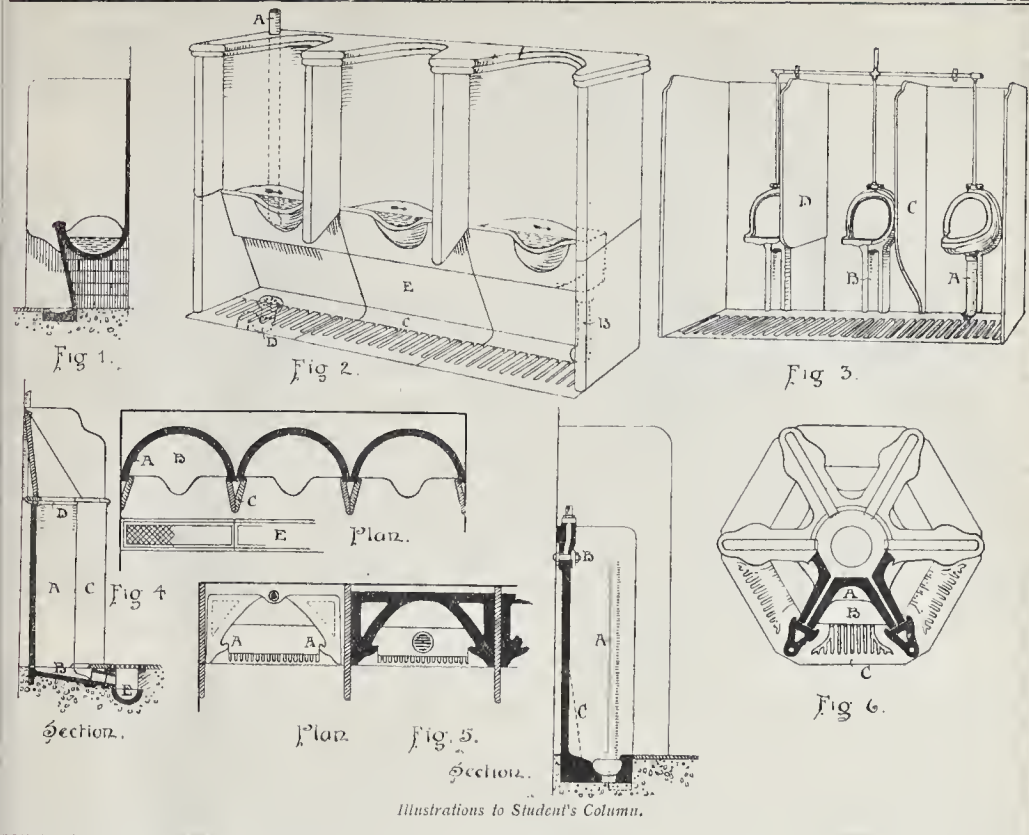
Surely it is not too much to ask the Department, in the interests of the education they are supposed to foster, to either adhere to their syllabus or alter it.
 FAIRPLAY.

SIR,—Mr. Henry Adams is to the point when he states that "the examination held by the Board of Education in Building Construction on the 11th inst. has caused a shock to . . . students throughout the country."

As one of the students who sat, I consider, then, many of the questions were hardly, to say the least, what one would expect, having regard to previous papers.

My object in writing, however, is to find out what is a "shiner." I have asked men whose experience led me to believe that they would know, but beyond humorous replies I have not received an answer. Will one of your readers kindly oblige? Of course it cannot be a good person in a bad world; neither is it at all related to the celestial sphere, although, for all some know, it might be.
 J. W. KAMPE.

METHODIST CHAPEL, SHIREBROOK, DERBYSHIRE.—The memorial-stones have just been laid of a Methodist church at Shirebrook. The building will be a two-story structure. The chapel, on the upper floor, will have seating accommodation for 210. This will be capable of extension to 250 seats by utilising the two vestries, which will be separated from the main building by movable partitions. A classroom will also be provided on the lower floor with a seating capacity of eighty, and the remainder of this floor contains rooms for storage. The exterior of the edifice is of red brick with stone dressings and semicircular red-brick arches to the windows. The contract for the building has been let to Mr. W. H. Feavill, of Ollerton, at 709l. 10s., and Mr. Joseph Perkin, of Shirebrook, is the architect.



Illustrations to Student's Column.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

19.—URINALS. (Continued).

TROUGH URINALS.—These consist, as a rule, of a glazed fireclay trough with a weir at one end so that a certain quantity of water is retained in the trough, and an inlet at the other end for the supply of fresh water from a flushing tank. They are therefore very similar to trough-closets, but smaller; the back may with advantage be higher than the front, in order to reduce the risk of fouling the wall, and the front edge ought to slope inwards, so that droppings will not run down the front and on to the floor. The dilution of the urine is a point in their favour, but they are seldom used now for high-class work, as the retention of the urine causes furring, and as users do not always discharge all the urine into the trough, but allow some to soil the front of the trough or the apron and floor below it. Floor-channels and draining slabs must be fixed under these as under urinal basins. Painted cast-iron troughs are sometimes used, but the paint is soon destroyed. Enamelled iron is better. Slate trough-urinals are also made, but the joints and angles are very objectionable.

Fig. 1 is a section of a trough urinal of ordinary form with enamelled fireclay trough and capping, slate apron, back and divisions, and salt-glazed floor-channel. Adams's trough-urinal (fig. 2) is a great improvement. The stalls are 2 ft. 3 in. wide from centre to centre. The trough is of glazed ware, and has a projecting lip in the centre of each stall. The backs are also of glazed ware, semi-circular on plan, with projecting divisions of the same material, and the whole range is finished with glazed-ware capping. Water is retained in the trough by means of a weir at one end, and at the other end the flush-pipe A is connected. When the flush-tank is discharged, the water passes down the pipe A, along the trough, over the weir, and down the waste-pipe B into the floor-channel C, and thence to the gully and

trap D. The trough and channel are therefore flushed by the same discharge. The fluted floor-slab and channel are formed in one piece of glazed ware. The apron slabs at E are also of glazed ware. The range would be all the better if part of the flush were conveyed to a distributing nozzle in the back of each stall, so that the backs would be automatically cleansed as well as the trough and channel. In some trough urinals the outlet of the floor channel is at the same end as the outlet of the trough, and part of the flushing water is conveyed to the upper end of the channel by means of a small pipe connected to the main flush-pipe; this avoids the flooding of the channel with urine-polluted water from the trough.

Stall Urinals.—Urinals of this class are most commonly fixed in ranges. Formerly any kind of stone was considered good enough for the purpose, and many urinals still in existence consist of plain slabs of York stone arranged as backs, ends, and divisions. Stone of this kind soon becomes foul, and is quite unsuitable. Even slate and marble, dense though they are, absorb some portion of the urine. The best material for urinal stalls is undoubtedly enamelled fireclay, but care must be exercised in selection, as these large pieces are often damaged during manufacture. Salt-glazed fireclay is used for cheaper work, and some makers are now able to produce ware of this kind with a very smooth surface. Cast iron is often used for public urinals in the streets, but the ammonia given off by the urine soon destroys the paint, and causes corrosion of the metal.

Stalls composed of flat slabs of stone (including, of course, slate and marble) are difficult to keep clean, on account of the numerous angles and joints, and are not suitable for use in buildings. Slate urinals are, however, often used in the playgrounds of schools, in the open areas of railway stations, and in the yards of factories and other buildings, where a fairly satisfactory urinal is required at a moderate cost. Slabs should be provided for the back, ends, and divisions. Aprons were formerly fixed to prevent droppings falling on to the floor, but are now seldom used, as they cannot possibly be

flushed by the sparge pipe, and as they interfere with the washing of the floor. The stalls vary in width from about 18 in. for children to 24 in. for adults, and in height from about 3 ft. 6 in. for children to 5 ft. or 5 ft. 6 in. for adults. The division slabs project as a rule about 18 in. from the wall, and the end slabs from 18 in. to 24 in. A projection of 12 in. or 15 in. is, however, better for the divisions, as it enables users to stand closer to the back, and reduces the floor area soiled by droppings. The slabs are generally about 1 1/2 in. thick, all edges being rounded and all joints made tight with red lead. Holdfasts ought to be of copper, as iron is very soon corroded. It is not a good plan to carry the divisions down to the floor, as the angles thus formed are difficult to keep clean. Greater cleanliness is obtained by fixing the divisions about 15 in. or 18 in. above the floor, as shown at D in fig. 3; they can be secured by building them about 4 1/2 in. into the wall, and grouting with neat cement. Another form of division is shown at C in the same figure.

The slate used for urinals ought to be rubbed and either oiled or enamelled. The enamel is not very durable. An objection to slate is that it affords a convenient surface for the obscene and inane scribbles of fools. The objection can be removed by covering the slate periodically with a mixture of coal-tar and naphtha, which has the further advantage of preventing absorption.

Thick sheets of opaque glass have occasionally been used instead of slate, but have not proved satisfactory. Slabs of glazed fireclay have been used with much better results. Many urinal stalls in hotels and clubs are constructed of polished marble slabs, but, whatever the material may be, the numerous joints and angles, which cannot be avoided in slab urinals, are a serious disadvantage. As the sparge-pipes as a rule are only continued along the back, the divisions, which often receive a considerable amount of urine, are not adequately flushed.

The stall urinal constructed of slabs exposes a large surface to the action of urine, and is therefore difficult to keep clean and free from

smell. For urinals inside buildings it is a good plan to fix a basin in each stall, as the greater part of the urine is thus confined to a small surface which can be more thoroughly flushed with the same amount of water. Three stalls of this kind are shown in fig. 3. The backs, ends, and divisions may be of slate or marble, and the basins of porcelain, ground to a true surface at the back to fit closely against the slabs. The basin at A has a porcelain down-pipe with flat back ground to a true surface. Down-pipes of this kind often become coated inside with "fur" which gives off an unpleasant odour, and an open arm or socket is therefore sometimes made in it as near the basin as possible so that a brush can be inserted. The basin at B has a vertical channel with curved rims, instead of the down-pipe; every part of the urinal, therefore, can be easily cleansed. The basin and vertical channel are made in one piece of porcelain, the design being Shanks's patent. The floor channel is of white enamelled fire-clay, and the fluted floor-slabs of buff glazed fire-clay. The flush-pipes are of copper, supplied with water from a single automatic flush tank fixed about 7 ft. from the floor.

The great improvements which have been recently made in the manufacture of enamelled fireclay have rendered it possible to produce massive urinal stalls of excellent design, which have been very largely used in high-class work. As a rule, the backs are semi-circular on plan, made to fit on the top of a dished base or channel, but in the most modern urinals the base and back are in one piece. Fig. 4 gives the plan and section of a range of urinals of the former type. The backs, A, and bases, B, are of white enamelled fireclay; the front pillars, C, covering the joints between the backs, are in this example of slate or marble, but a glazed fireclay pillar in one piece is better; the upper backs and divisions are also of slate or marble. The stalls are flushed by copper sparge-pipes, D, following the curve of the backs, and the urine and water pass into a sunk channel, E, covered with a loose galvanised-iron grating. The floor slabs between the grating and urinal are of slate cut out in the centre of each stall, so that droppings will fall into the base of the urinal. The numerous joints are objectionable. The sunk channel is also apt to become foul.

The urinals shown in fig. 5 are of more modern design, the back and base being in one piece of white enamelled fireclay, measuring about 25 in. by 14 in. by 3 ft. 8 in. Slate or marble divisions are used to give the projection and height necessary for privacy. Lips are formed at AA to retain the flush within the curved back. Instead of a sparge pipe, a distributing nozzle (B) is used. A single outlet for the entire range is provided in the bottom of the channel. In other urinals a front outlet is formed in the base of each stall, and connected by a short bend to a drain under the floor. An objection to this urinal is that the stalls are unduly contracted between the lips AA, and persons who have been enjoying themselves not wisely but too well, will almost inevitably soil the angles outside the lips. It is better to obtain the full projection by adopting a deeper fireclay back with fireclay front pillars, as shown in fig. 6.

In some conveniences, where the walls are occupied by water-closets and lavatories, independent or pedestal urinals must be used. These are often hexagonal in plan, as shown in fig. 6. In this, as in many other modern urinals, the backs are made with a forward splay, A, towards the bottom, as this shape reduces splashing and is more thoroughly flushed. A splay of this kind is shown in section in fig. 5 by the dotted line C. The flushing cistern is fixed above the centre of the urinals. The channels are shown at B and the fluted foot-slabs at C. Bolding's "Laydas" urinal is a pedestal trough urinal, the trough having six lips, with slate or marble divisions between. The cistern is placed over the centre, and actuates a siphon by which the contents of the trough are periodically siphoned out.

In all ranges of urinals, except those with front-outlet bases, floor-channels are required. The best material for the purpose is enamelled fire-clay, stone and concrete being too absorbent and iron being soon damaged by rust. The channels must be bedded on concrete, and jointed with neat cement. The floor ought to be laid to fall towards the channel about $\frac{1}{2}$ in. per foot, so that the water will quickly drain away when the floor is washed with water from a hose-pipe. Glazed floor-slabs ought to

be laid between the stalls, and ought to be fluted so that visitors' boots will not be wetted by previous droppings. Dished slabs are often laid under single urinal-basins to receive droppings and drainings from the floor.

The flushing of urinals is a most important point. Many water companies have no regulations on the subject, but others, including the Metropolitan companies, limit the supply to one gallon. The regulations made under the Metropolitan Water Act, 1871, are as follows:—

"Every . . . urinal . . . in which water supplied by the company is used . . . shall be served only through a cistern or service-box . . . and there shall be no direct communication from the pipes of the company to any . . . urinal . . ."

"Every urinal-cistern in which water supplied by the company is used (other than public urinal-cisterns, or cisterns having attached to them a self-closing apparatus) shall have an efficient 'waste-preventing' apparatus, so constructed as not to be capable of discharging more than one gallon of water at each flush."

Other water companies (Bournemouth, for example) insist on urinals being "supplied with water by meter."

In the case of single urinals in private houses a one-gallon cistern actuated by a pull-handle is the best arrangement, but for ranges of urinals an automatic cistern regulated to discharge at frequent intervals is more satisfactory. No hard-and-fast rule can be laid down as to the number of flushes and amount of water required, but it may be stated that in public urinals half a gallon of water per minute per stall is often allowed. As a rule, not more than six urinals should be flushed from one cistern on account of the difficulty of distributing the water equally to all the stalls. Perforated copper sparge-pipes have been largely used for flushing stall urinals, but are not very satisfactory; splashing frequently occurs and some of the holes become choked, so that a large part of the surface is often not touched by the water. Iron sparge-pipes are soon destroyed by corrosion. In more recent stall urinals with curved backs a distributing nozzle is adopted, which is simply a short tube with closed end and with a transverse slit cut obliquely in the lower half; this gives an excellent flush, and distributes the water over the whole of the curved surface below the nozzle. It is also much neater and cleaner than a sparge-pipe. Care should be taken that the nozzle is of such a type that it can be removed without disturbing the urinal.

Urinal cisterns are often constructed with a copper or brass framework and glass sides, so that the attendant can see at a glance whether they are working properly or not. Enamelled fireclay is an excellent material, and marble cisterns with glass panels are also used. Iron is not satisfactory for use in urinals unless vitreous-enamelled. It is best to regulate the supply of water so that the cistern will discharge their contents at fixed intervals; the regulation can be effected by means of a stop-cock on the supply-pipe or by a perforated disc in the union, the latter being required by some water companies. A controlling vessel is sometimes fixed in connexion with trough urinals, by which the number of flushes is automatically regulated according to the usage of the urinals. It economises water, but may lead to furring, as a considerable quantity of urine may remain in the troughs for a long period. In other cases a treadle action is adopted, the flush being started by the weight of the person standing on the grating, but the boxes under the gratings are difficult to keep clean, even when they are made of enamelled iron, and part of the flushing water is conveyed into them. Cisterns actuated by the opening of the door of the convenience have also been used, but this arrangement leads to waste of water.

Public urinals above ground are often constructed of cast iron, but frequent painting is required to retard the inevitable corrosion caused by the ammonia and water. Sometimes such urinals are constructed of vertical slabs of slate with grooved edges into which iron tongues are fitted, but the shoulders of the grooves are soon burst off by frost and by the corrosion of the iron.

"Urnette" is the name given to a fitting intended for ladies' use. These have been occasionally fixed in ladies' public conveniences, as they occupy less space than water-closets, although they are made on the same general lines. In the underground conveniences in Shoreditch the space allotted to each urnette is 2 ft. 3 in. by 2 ft. 9 in.; the divisions

between them are of marble, and a waterproof curtain is hung in front of each basin. The urnette is practically a wash-down closet, with a fixed seat, which is all the better if the front portion is entirely cut away. A range of urinettes may be flushed from a single automatic cistern.

OBITUARY.

MR. EBENEZER GREGG.—Mr. Ebenezer Gregg, of 1A, St. Helen's-place, London, E.C., died on May 14, at Teighmore, Sutton, Surrey. At the early age of thirteen he left school and entered the office of Mr. Sabine, architect, of Old Broad-street, where, before he attained the age of seventeen, he was appointed manager, which post he retained until 1868, when he commenced to practise at 1A, St. Helen's-place. He quickly succeeded in establishing a large and influential connexion. He was elected a Fellow of the Royal Institute of British Architects in 1870, and at the time of his death had been for many years Examiner on Professional Practice and Specification. While his practice was chiefly of a domestic character, he was an architect of wide scope. Some of his chief works were:—Dr. Barnardo's Village Home at Ilford; officers' quarters, ice-house, offices, &c., of the Royal Mail Steam Packet Company, both at Southampton and London; Moody and Sankey's Temporary Mission Hall to seat 10,000, erected in six weeks; the Banks of Adelaide, New Zealand, and New South Wales; and more recently as London architect for the Exploration Company's building at Johannesburg; and the works at 71 and 72, Piccadilly, 24, Austin Friars, and 141, Fenchurch-street may be mentioned. For many years he has acted as surveyor to Jesus College, Cambridge. His death at the age of sixty-eight will be deeply regretted, especially amongst students, for he was always in a helping hand. He will be succeeded in his practice by his son, Mr. Theodore Gregg.

GENERAL BUILDING NEWS.

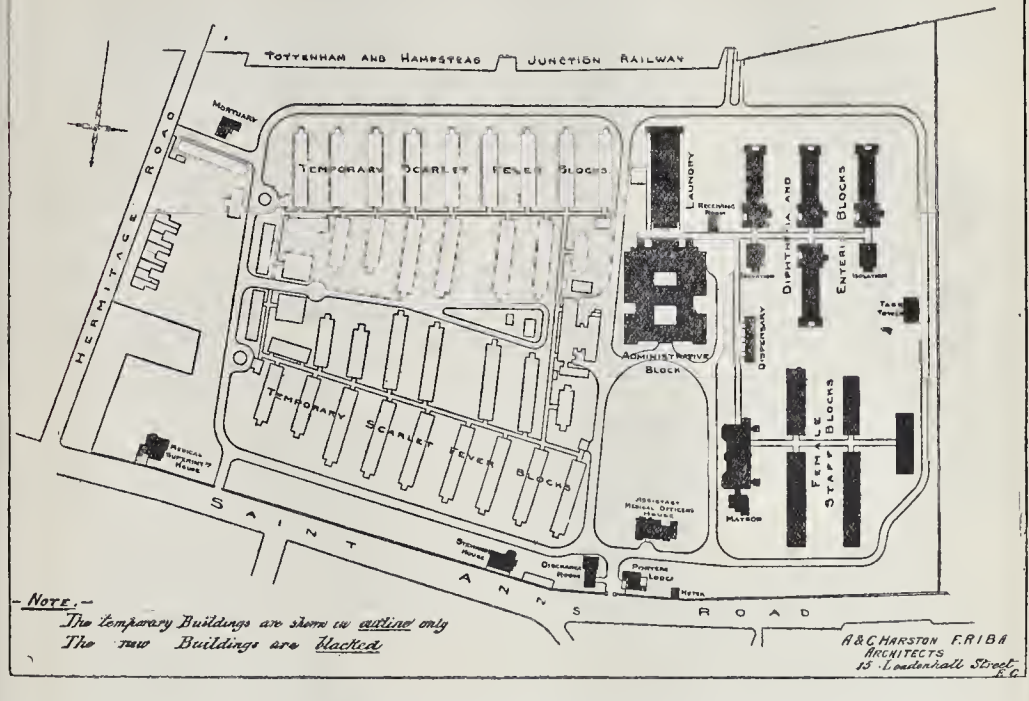
WESLEYAN CHURCH, SUNDERLAND.—On the 8th inst. the foundation-stone of the new Wesleyan church, which is to be erected on the Holly House site at the junction of the Tunstall and Durham roads, Sunderland, was laid. The new church is to be built in the Gothic style, and is 70 ft. long by 41 ft. wide across the nave, and 65 ft. wide across the transepts, with a gallery in the transepts and down the sides and across the ends. It will seat 800 persons. The spire is 104 ft. in height. The building is faced with Patley Bridge stone and Northumberland stone dressings. The school is 50 ft. by 41 ft., with a gallery on three sides. The gallery can be divided into classrooms by means of revolving shutters. The school will accommodate 500 to 600 scholars. There are several vestries and infants' class and a ladies' parlour. The estimated cost is about 15,000*l.*, including site. Mr. F. Jameson Green, Liverpool, is architect, and Mr. W. A. Lowry, Liverpool, clerk of works; and Mr. J. B. Stott, the contractor.

PROPOSED NEW CHURCH, ABERDEEN.—Plans of new Melville Church, to be erected at the junction of Rose-street and Skene-street, prepared by Messrs. Brown & Watt, architects, Aberdeen, have been laid before Aberdeen United Free Church Presbytery, and remitted to a committee with powers. The designs show an elevation to Skene-street with a spire, and also an elevation to Rose-street. In the church there will be sitting accommodation for 705 people, and in the halls in the rear of the building and fronting Rose-street sitting room for 500. The building is to be square, with a circular auditorium, and the total expense is estimated at the sum of 7,000*l.*

CHURCH, AYR.—The new church erected by the Ayr Original Secession congregation as a memorial to the Rev. John Robertson has just been opened. The church occupies a site at the junction of Craigie-road and Dampark-road, facing the new Victoria Bridge. It has been built to the design of Mr. Allan Stevenson, architect, Ayr, at a cost of about 3,000*l.* The style is Gothic, and the building is of Ballochmyle stone. The entrance porch is in the west front, with two double-light tracied windows above. There are small transepts at the north and south sides. The church is seated for about 400. A hall behind the church has accommodation for 200, and the session-house, which adjoins, can be thrown into the hall by folding doors. The other accommodation includes vestry and ladies' room, with lavatories attached. The electric light is used throughout, and the church and hall are heated by hot-water pipes on the low-pressure system. The ventilation is by inlets at walls and windows, and outlets on roofs. The roof is of open timber. The contractors for the work were:—Mason, Trustees of the late Andrew Thompson; joiner, David Milligan; plumber and slater, Wm. Auld & Sons; plasterer, D. & T. Bone; electric light, Wm. Auld & Sons; heating, H. Montgomerie.

CONGREGATIONAL CHURCH, BIRKENHEAD.—The new Congregational church in Old Chester-road, Tranmere, was opened on the 17th inst. The church has been erected on a site to the east of the Old Chester-road facing the Liberal Club, the building being set back from the road, with land

— NORTH EASTERN HOSPITAL. —



erved at the rear for future schools. The church consists of nave, transepts, and end gallery, provision being made in the chancel for an organ. There are three entrances to the church, two from Old Chester-road and one from the rear, and accommodation is arranged for over 500 adults. Two vestries are provided. The elevations are late Gothic in design, a tower being arranged on the north-east angle. White Storeton stone, relieved by red Trammere sandstone, is used for the fronts to Old Chester-road. The woodwork within the building is of varnished pitch pine, and the windows to the main road are filled with leadlights. The contract has been carried out by Mr. Richard Allen, of Birkenhead, the architect being Mr. T. W. Cubbon, Birkenhead.

PROPOSED NEW CHURCH NEAR ABERDEEN.—The architects, Messrs. D. & J. R. McMillan, Aberdeen, have been instructed to proceed with the preparation of working plans for the new United Free church at Cults, in the suburbs of Aberdeen. The site will be a central one in Cults village. The design submitted, which has been generally approved of, is of Gothic type with Scottish features, and is cruciform in plan. There will be a tower on the west and an apse behind the pulpit, where provision is made for an organ; and there will be sitting accommodation for fully 600. There will also be hall, session-house, ladies' workroom, and tea kitchen; and the total cost will be about 4,000.

ALTERATIONS TO COCKS & BIDDULPHS BANK.—This bank, situated in Charing Cross, was built several years since from the designs of Mr. Richard Coad. It is now to be extended into Spring-gardens, where the new front will be. The building now being begun by Messrs. Dove Bros., the contractors, comprises new partners-room, strong-rooms, a considerable enlargement of the bank premises, as well as three floors of offices which will be let. The new front will be of Brackley bricks and Portland stone. The building is fire-proof throughout; the ironwork, &c., being provided by Messrs. Fawcett. The cost will be about 12,000. The design has been prepared by Mr. J. Oldrid Scott.

BUSINESS PREMISES, DUNDEE.—New premises for Messrs. Malcolm Bros., the Dundee auctioneers, have been erected in Commercial-street, Dundee. Mr. J. H. Langlands was the architect, and the contractors were as follows:—Builders, Messrs. James Binny & Co.; joiners, Messrs. Alex. Bruce & Co.; painters, Messrs. Mackay & Son; plumber, Mr. David Brown; electric lighting, Messrs. G. H. Nicoll & Co.; grates and tiles, Messrs. Sinclair & Ewing.

NEW BUILDINGS, NORTH EASTERN HOSPITAL.—The original North-Eastern Hospital consists of a group of temporary buildings hastily erected in 1892, in face of an epidemic of scarlet fever, and intended only to last for one year. The area of the site was then 19 acres, but additional land has since been purchased, and the total is now about 33 acres, including a recreation ground, not shown on the accompanying plan, situated on the south side of the railway. The new buildings, which form the first section of the proposed permanent hospital, are shown black on the plan. They consist of an administrative block, laundry, staff quarters, medical superintendent's and steward's houses, porter's lodge, receiving and discharge rooms, mortuary, dispensary, four diphtheria and enteric blocks, two isolation blocks, and tank tower. The normal number of beds in the reconstructed hospital will be 548. The new buildings provide for diphtheria and enteric patients and eight isolation beds. They also include accommodation for the entire staff of the future hospital. The buildings have been erected by Messrs. McCormick & Sons, whose contracts include all engineering work except kitchen and laundry fittings. The contract amounts were as follows:—Main contract, 113,642l.; laundry, 8,865l. The kitchen fittings were provided by Messrs. C. Kite & Co., whose contract amounted to 1,050l., and the contract for laundry fittings has recently been let to Messrs. Bradford & Co. at 4,580l. The medical superintendent's residence was built by Messrs. Wm. Johnson & Co., of Wandsworth-common, at a cost of 1,968l. Messrs. A. & C. Harston, Leadenhall-street, were the architects, and Mr. W. Lawrence clerk of the works.

PRINCE'S THEATRE, MANCHESTER.—Important structural alterations are about to be made to this theatre to suit the requirements of the City Surveyor, and in accordance with the views of the Watch Committee of the Corporation. The proposed alterations will be made mainly to remodel the entrances and provide additional exits. The exit staircase from the gallery into Oxford-street will involve the complete alteration and reconstruction of the front portion of the building, including a new marble staircase to the dress circle, a new entrance hall lined with marble, and a new box office. The circle staircase will open into a lounge on the circle level, from which is entered a new retiring and cloakroom for ladies. The large folding central doors lead directly into the promenade at the back of the circle seats, and the doors on the Oxford-street side of the new lounge will open direct on to the flat roof of the present verandah. The stall staircases will be widened and constructed of concrete, and exit doors provided in the barrier direct into the pit.

Other structural changes will be made, notably the improved staircase into the saloon bar, the direct exit therefrom into Bale-street, completion of the present gallery entrance staircase in fireproof material, enlargement of the orchestra, and general improvement of the lavatory accommodation. A scheme has been carefully prepared for the complete heating and ventilation of the theatre, and the building will be fitted throughout with the electric light. Mr. John Bland, of Manchester, is the contractor for the structural alterations. These will involve the redecoration of the entire house in front of the curtain. In preparing a new scheme of decoration the architects have, as a matter of course, retained the proscenium frieze painted by the late H. Stacey Marks, R.A., and which has allied so remarkably the Princes Theatre with the painter's art of the time. The side pictures by the late Mr. Phillips will also be retained; they are in harmony with the frieze and contemporaneous therewith. The ceiling below the central dome will have the main panels filled with figure subjects, suggestive of the art of the Theatre, alternating with portrait heads of those who have contributed to the creation and maintenance of dramatic art. The front of the dress circle tier will be enriched with hand-painted panels, containing scrolls, with the names of dramatists and musicians thereon. The panels of the upper circle tier will be treated in a similar manner, the centres being alternately enriched with the Rose of Lancaster and the three feathers. The gallery front will have a continuous scroll ornament, and the various ceilings will receive careful attention in the way of enrichment. The upholstery will be renewed throughout in a blue tone; the hangings will be of blue plush with gold trimmings, all in harmony with the new act drop painted by Mr. Conrad Tritcher. The new lounge will receive special treatment, and the saloon bar will have a new ceiling, frieze of figure subjects, and rich wall-paper. The contracts for the decoration and upholstery will be carried out by Messrs. J. Binns & Sons, of Halifax, the theatre decorators, and the upholstery has been let by them to Messrs. Turner, Son, & Walker, of Liverpool. The whole of the structural and decorative work will be executed from drawings prepared by the architects, Messrs. Darbyshire & Smith, and will be carried out under their personal superintendence.

NEW HOSPITAL, SUTTON, SURREY.—The foundation-stone of the new hospital was laid at Sutton recently. The new building, which is being erected by Mr. J. B. Potter, of Sutton, from the designs of Mr. Cecil Sharp, architect, will cost about 3,000l., with the furnishing, &c. The central building will consist of a doctor's and matron's room, with bedrooms for the matron and staff over, and there will

be pavilions on each side, divided into two wards each, two of the wards containing four beds, and two two each, thus providing for twelve patients.

HOTEL CECIL EXTENSION.—The block of buildings, having a frontage to the Strand between (old) Ivy Bridge-lane and Carting-lane, is nearly completed. The block has supplanted Salisbury and Cecil streets. It comprises shops, offices, and chambers, erected by Mr. J. Carmichael, builder, after the plans and design of Mr. Joseph Sawyer, the sanitary arrangements and fittings being by Messrs. George Jennings, Limited.

FOREIGN.

GERMANY.—The German Emperor has sanctioned the plans for building a new museum near the Polytechnic Academy at Charlottenburg, near Berlin, to contain models and copies of architectural and plastic works of art.—Since the closing of the trachyte quarries near the Drachenfels, in the Siebengebirge, that stone has not been so extensively used in the Rhine valley; but recent discoveries have proved the existence of a very similar rock near Kelberg, in the Eifel, which it is proposed to introduce to the market. Trachyte has for many centuries been a favourite building material with Rhenish architects, many of the churches in Cologne, including a great part of the cathedral, being composed of it.

INDIA.—A large stone bridge is about to be erected over the Chooray river, on the Ranaghat-Kishnagar Light Railway, at the suggestion of the Government of Bengal.—The Anglican community of Rangoon are trying to raise a lakh of rupees as a memorial to Queen Victoria to complete the Rangoon Cathedral.—The harbour improvements at Madras are still under contemplation, though Indian engineers are not sanguine that as at present proposed they will be adequate enough for the purpose.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. T. W. Aldwinckle & Son, architects, have removed their offices from 1, Victoria-street, Westminster, to 20, Denman-street, London Bridge, S.E.—Mr. W. J. Morley, architect, of 259, Strand, arcade, Bradford, has taken his son, Mr. Richard Morley, into partnership, and the practice will be carried on in future under the style of W. J. Morley & Son.

ISOLATION HOSPITAL, CHORLEY.—Messrs. Shorland & Brother ask us to mention that the large wards in this building, described in our last issue, are warmed with their central patent Manchester stoves.

HOUSE-RENTS IN STOCKHOLM.—A matter which greatly affects Stockholm at the present time, and helps to make it an extremely expensive place of residence, is (says an official report) the want of sufficient house accommodation. An Inspector of Poor reported last autumn that he feared in the present year things would be worse than ever. As the want of dwellings was very great, and the demand for them still greater, numbers of people were then applying to the authorities for assistance to get or keep a roof over their heads. All one-roomed apartments were taken about September, and so for those with two rooms and a kitchen, even on the outskirts of the town, the enormous rents of up to 27*l.* 15*s.* to 33*l.* 6*s.* were asked. So much for the dwellings of the poor; but rents for people much better off are also exceedingly high. Seven or eight-roomed flats in a second-class street fetch 150*l.* to 150*l.*, and although 18*l.* or 20*l.* per room is dear enough, one hears continually of rents being put up. It may, perhaps, be difficult altogether to account for this state of things, but, as tending towards high rents, there are the facts that houses in Stockholm are built in handsome and expensive styles, and that borrowing capital for building purposes in times like the present is a costly proceeding.

THE LAND TRANSFER ACT, 1897.—An order in Council has been issued whereby the operation of the Order in Council of July 18, 1898, under the Act of 1897, in as far as it affects the City of London, is again postponed until January 1 of next year.

THE STRAND IMPROVEMENT.—The removal to Brookwood Cemetery by the London Necropolis Company of human remains from the churchyards of St. Mary-le-Strand and St. Clement Danes is now completed. The Company's tender to the London County Council for the work amounted to 2,258*l.* 15*s.*, and they have undertaken, at an estimated cost of 650*l.*, to lay the foundations of the dwarf walls and railings around the portions of the churchyards that will remain enclosed. The cost of repaving and other alterations now being carried out on the two cleared sites is estimated at 6,204*l.*; at St. Clement Danes the works in progress comprise a portion of the subway which will be constructed beneath the new thoroughfare—High Holborn to the Strand.

ARCHAEOLOGICAL DISCOVERY.—A discovery, it is stated, has been made at Peterborough Minster. In removing the rubble which filled one of the many pointed arches in the wall at the eastern extremity of the Palace-gardens, a window of beautiful flowing tracery was revealed.

The stonework was in an excellent state of preservation, and only a small portion of one column was missing. It is intended to unseal the neighbouring arches, in the hope that similar archaeological treasures may be found. The wall originally formed part of a passage leading from the cloisters to the monks' kitchen.

STONEHENGE.—Sir Edmund Antrobus has intimated his intention, it is stated, of enclosing Stonehenge in accordance with the advice given to him by various bodies interested in antiquarian and archaeological research. It is his intention, however, without relinquishing any of his rights as owner of the property, to admit visitors within the enclosure on payment of 1*s.* each person on condition that they conform to the regulations.

CAPITAL AND LABOUR.

PENRYN QUARRIES.—The Penryn Quarry will be open on Tuesday, June 11, to all the late employees who have applied for work and have been accepted. The Discipline Rules have been relaxed, and a new rule has been drawn up and agreed upon, which will practically give a half-holiday on the last day of every month; in other respects the Quarry Rules remain as before. (The new rules referred to are printed below.) Applications from "boys" for readmission to the quarry "cannot" be considered until at least a fortnight after the commencement of work by the men. In order to enforce the law concerning intimidation or annoyance by violence or otherwise (under the Conspiracy and Protection Act), police protection has been promised by the Chief Constable, Colonel Ruck. **NEW RULES:—Discipline.**—All punishments will be by "suspension" or dismissal. For instance, if a workman comes late (except through sickness or sudden case of great emergency) he will the first time be "cautioned," the second time suspended quarter of a day, third offence half-day; but persistent offenders would be more seriously punished or dismissed. **Settling Down.**—On the last Tuesday in each Quarry month the employees, after giving up their slates, settling their accounts, and arranging their bargains for the coming month, will be free to leave the quarry if they wish for the remainder of the day.

YARMOUTH BUILDING STRIKE.—The members of the Operative Bricklayers' Union, to the number of about 140, recently met at the Free Stall House, Market-place, Yarmouth, to discuss the rules sent by the Masters' Association a few days since. The principal matters for consideration were the question of the working hours in winter, the apprentice clause, and the rate of wages. Mr. Holdsworth, secretary of the Operative Bricklayers' Society, presided. Rule 1, as submitted by the masters, proposed that the winter working hours, commencing from the last Monday in October, should be as follows:—For first four weeks, 6.30 to 5 p.m. for five days, and 6.30 to 1 on Saturdays, 5*h* 15*m* per week. For the ten middle weeks, commencing on the fourth Monday in November, five days from 7.30 a.m. to 4.30 p.m., and from 7.30 a.m. to 1 p.m. on Saturdays, 4*h* 15*m*. For the last four weeks of the winter term, commencing the first Monday in February, five days from 6.30 a.m. to 5.30 p.m., and on Saturdays from 6.30 to 1 p.m., 5*h* 15*m*. Full time to commence on the first Monday in March, when the hours will be 5*h* 15*m* per week. A lengthy discussion took place on this rule, and it was pointed out that both rent and the price of provisions had increased so much in the last few years that any such arrangement as that proposed by the masters would leave them with but a bare subsistence at a time when they most required as near to full time as possible. So large a reduction of the hours meant a large reduction in their wages, which they considered unfair, and could not accept with justice to themselves or their families. It was unanimously resolved to stand by the old rule, with the exception of the period of a month in winter—a fortnight before and after Christmas—when they would be willing to a reduction of working time from 7 a.m. to 4.30 p.m., and 7.30 to 1 on Saturdays. The men thought that, taking into consideration that they were frequently compelled to lose time in consequence of bad weather and from other causes, these terms should be agreed to. With regard to the wages clause, they were willing to agree to the masters' offer of an advance of a halfpenny per hour, provided that a further advance of a similar amount be conceded in April, 1902. It was also decided that if the employers did not agree to this proposal the men would not come out before submitting the question to arbitration. With regard to apprentices, it was decided to stick to their old rule made in 1897, which stipulated that boys entering the trade were not to work more than six months without being legally bound for a term of four years. In respect to Rule 9, the meeting desired the masters to alter the word "workmen" to "bricklayers," so that it would read "The Bricklayers' Operative Society agree to work in harmony with any bricklayers engaged," &c. The rules which provided for the agreement between masters and men to end on October 1 were not agreed to, the men strongly adhering to their old date, viz., the first Monday in April.

LEGAL.

ACTION BY BUILDERS AND CONTRACTORS.

THE hearing of the case of Graham & Sons v. the Commissioners of Works and Public Buildings was commenced before Justices Ridley and Phillimore on the 22nd inst. in the King's Bench Division. It was an action by the plaintiffs, builders and contractors, to recover from the defendants damages for alleged breach of contract and for wrongful conversion of builder's plant.

It appeared that in September, 1899, the plaintiffs entered into a contract with the defendants to build a post-office at Stalybridge, in Lancashire, and by their statement of claim, they alleged that on December 31, 1900, the defendants wrongfully determined and repudiated the contract and prevented the plaintiffs from executing the work in question. The Commissioners, amongst other pleas, pleaded that they were a corporation under and subject to the provisions of 14 and 15 Vict., c. 42; 15 Vict., c. 28, and 37 and 38 Vict., c. 84, and that the contract in question was entered into by them as servants and agents of the Crown and on behalf of the Crown, and not otherwise, and their case was that no claim in any event could be maintained against them upon the contract; and alternatively that the plaintiffs could only put forward such claim by petition of right. The plaintiffs replied that defendants were a corporation to all intents and purposes. The only question now raised was the question of law raised by the above pleas.

After hearing the arguments of counsel, their lordships held that the defendants expressly contracted for themselves, and must be treated as principals and not liable under the contract. They accordingly gave judgment for the plaintiffs, the builders.

Mr. Scott Fox, K.C., and Mr. Andrew Strain appeared for the plaintiffs and the Attorney-General and Mr. Askwith for the defendants.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

1,220.—**WALL-TIES:** J. G. McDowell.—The serrated edges of metal strips engage with the bricks, whilst their ends have flanges which will fit on the outside of the bricks and in recesses in the masonry work. For fastening bricks to woodwork, nails are inserted through holes in the strips into the wood sheathing, and the strips are then turned over the bricks.

1,223.—**STAGING AND SCAFFOLDING:** E. F. Palmer and E. T. Palmer.—For a travelling scaffold ladders are fixed in sockets upon a base which runs on wheels, and adjustable screw couplings are provided for the connecting rails, bolts and tie-roads. Boards laid over planks that rest upon the ladder-rounds and have guard-rails constitute a working stage or platform, and two or more ladders can be joined together with channel irons, sockets, &c.

1,241.—**CONVEYERS:** C. Clay.—Sprocket wheels carry a pair of endless chains that move in parallel planes, pins secure tables to the chains, and a distance which is equal to that between the axes of the pins upon each table separates the axes of the two sprocket wheels mounted at either end; the tables, therefore, will remain in a horizontal plane during their movement by the conveyer. The lower run may be arranged upon one roller with the upper run upon another floor, and rollers fitted upon each of the tables will engage with the main and the end rails.

1,246.—**PULLEY BLOCKS:** A. Kelly and The side-plates, between which the sheave is carried, are kept apart at the required distance with flanges, and their extension upwards constitutes a necking, from within which project rings for engagement with similar rings upon the eye-bolt.

1,260.—**A BAND FRICTION BRAKE:** A. Kelly and C. D. B. Hansen.—The brake, intended for use with windlasses and capstans, consists of two bands around the drum, which are joined with links to the outer ends of an equivalent lever linked to the bed-plate and pivoted on to a block that presses against the drum. From the lever projects an arm, to which are linked the worm and toothed quadrant which work the brake.

1,278.—**PARALLEL ROLLERS:** W. P. Johnson.—A projecting straight-edge is mounted upon end plates in which are journaled the rollers, which may be of different sizes. In order that the straight-edge may be easily banded, it is furnished with an ear or a flange.

1,310.—**APPLIANCES FOR CAGE LIFTS:** W. D. Syers.—Friction is reduced by means of the rubber or air tyres of pulleys that run in V-grooved guides around the sides of the well, and the balance weight is fitted in the same manner. For regulating the pressure the pulleys are carried adjustably upon bell-crank levers, and the cage has side plates that will avail in cases of emergency.

1,360.—**WIRE FENCING:** D. Rowell.—The sharp pointed metal standard has perforations through which spikes can be driven when it has been forced into the ground; clips are used for fastening wire-droppers to the horizontal wires, and are to be hooked on to one limb of the dropper.

1,428.—FLUSHING APPARATUS: F. Duckell & Son, G. F. Duckell, and F. W. Unblock. In the case of latrines or multiple closets the water is caused to flow into the siphon and the cistern by lifting the dead-weight valve with the pull, after which it flows through the fall-pipe and so sets up a current of air from the air chamber until a vacuum has been formed in the latter, then the contents of the basins and their connecting trough are siphoned through the middle trap until water in the cistern falls below a certain level, but until the cistern has been emptied and the pipes and basins recharged the upper siphon will continue to act. The closets when not in use may be emptied by means of a stop-tap in the air extractor pipe.

1,445.—TRANSFORMERS (ELECTRICAL): A. H. Loring and H. L. Clark. The casing or box can be affixed to a wall or post, and has a sliding door, the core consists of two pieces, whereof one is secured (for closing circuit) with a bar, yoke, and screw-clamp, and the other should be U-shaped, the coils being adapted to slide on to or from the limbs of the core when its latter portion is detached. A bracket with lugs holds the core in its place within the box.

1,458.—FIRE-PROOFING COMPOSITIONS: C. Schroeder.—Wood, fabrics, &c., are treated with borax and sulphate of magnesia, to which may be added gypsum and ammonium chloride, in order to form an insoluble borate of magnesia. 1,493.—A TUBE FOR BORING AND LINING WELLS: F. Pelike.—The suction or straining piece of a well boring and lining tube is screwed on to it and has the earth borer at its extreme end, it is guarded with a metal sleeve upon the tube, and at its lower end (just above the borer) is a protecting ring in the shape of a wedge.

1,506.—BRACKET FOR RODS AND THEIR FITTINGS: F. K. Drake (Drake & Co.). A grooved or recessed bracket is bent so as to form a circular loop, a projection from the rod is put into the opening of the loop so that it shall engage with the groove when the rod is turned, a plate that closes the bracket end may be fashioned in one piece with the blank, or it may be held in its place with a slide, the end of the barrel being turned over, or by springing it into a recess within the barrel. Various modifications are specified—in one form a cup-shaped bracket has a notched lip that takes the projection upon the rod, and is to be affixed to the retaining screw either loosely or rigidly by a turn of the ends over two discs that are threaded on the screw, one being turned around the head; or the cup having either a plain or a gapped flange is screwed on to the threaded head of the holding screw.

1,515.—EXTINCTION OF FIRE: G. Edwards.—A special fire cases made of cardboard and disposed ready for use filled with a powder composed of gunpowder, sand, and carbonates of lime and soda mixed together.

1,531.—A REGULATOR FOR ELECTRICAL LAMPS: F. K. Halmaker.—A divided resistance and a covered switch constitute a rheostat. The former should consist of a metal wire, which is set in enamel upon a metal tube mounted upon the base and put around the insulating joint of the bracket. The switch comprises a pile of metal discs, whereof those at the top and bottom are riveted together, layers of insulating material being interposed between the several discs. The switch is held up with an extension of the disc which is next beneath the top one and is affixed to the base, and it is encompassed with some insulating material such as asbestos. On the top disc is a lug connected to one supply wire. A handle-turned shaft is carried over the top disc and, and on the shaft is a trailing spring within a series of contacts turned downwards from the lower range of discs whereon are lugs connected with wires to the divided resistance; thus either none, or part, or the whole can be placed in circuit, or the circuit can be opened. In order that the spring may snap from each to the next one the contacts are turned inwards.

1,554.—CONSTRUCTION OF FLOORS, ARCHES, ROOFS, &c.: F. Loxton.—For these the inventor devises perforated blocks of concrete fashioned with rebated ends and with sides inclined so as to interlock with one another. The blocks are to be laid to break joint, and are then united with cement.

1,570.—AN APPLIANCE FOR PAINTERS' USE: F. Neighly.—With the brush are combined a reservoir or the paint, and a flexible tube attached to the root of the bristles which is fitted with a tap; a spring joint together two levers which press the reservoir between them; paint is poured into the reservoir through a capped orifice.

1,650.—APPARATUS FOR USE WITH LIFTS: F. Leather and F. Bolton.—The inventors' object is to provide means of holding open the folding doors whilst the cage is at the floor, and of automatically shutting and locking the doors when the cage moves. Two arms are screwed upon a cross-shaft which extends across the top of the doorway, and are provided with their normal position with springs. When the cage has arrived at a floor, a catch that projects from it engages with an arm upon the hat and rocks the shaft. As the doors are opened they engage with catches that hang upon the two arms of the cross-shaft. Then with the departure of the cage springs shut the doors, which are then with locked with spring catches that engage with a short bar, and will be again raised, so that the doors may be pushed back, by means of their

engagement with a lug upon the shaft as it is turned by the cage.

1,661.—SEATS FOR ASSISTANTS IN SHOPS, &c.: F. J. Boyd.—From a hook or eye upon the upper end of a standard or plate hangs a stirrup on to which the seat is pivoted. As the unused seat hangs down it may be swung aside out of the way, but for use it is secured with a projection that fits into a socket. The latter may be formed in the seat and the plate may be made crank-wise to serve for the former.

1,692.—URINALS: W. Oates.—For urinals after the "stall" type the front edges are fashioned parallel to one another and are vertical, the backs and sides being sloped inwards from top to bottom; it is intended that the diminishing surface thus obtained shall concentrate the flush.

1,704.—AN ELECTRICAL CONTACT-MAKER FOR BURGALAR ALARMS, &c.: D. Prial.—Two terminals connected to the alarm circuit are fitted on the base which is fixed to the door or other part of the building, &c.; from one of two other terminal plates is hung a pendulum of which the rod is passed through a hole in the other of the plates. Under normal conditions the rod rests out of contact with the last-named terminal plate; it is either jointed or wholly or partially flexible. When the pendulum is caused to vibrate by any means the alarm circuit between its rod and the plate will become completed. If it is desired to substitute the appliance for the ordinary contact buttons or pushes of electrical bells, it may be disposed for operation by the hand or otherwise.

1,705.—METHOD OF DRYING BLOCKS OF ARTIFICIAL STONE AND OF SLAKING LIME AT THE SAME TIME: W. Olschewsky.—For the stacking of moulded blocks upon the truck the lower layers are strengthened against the pressure exerted by those above them by being first dried over a chamber into which steam is admitted; the lime in the chamber becomes slaked by the condensed water and the engendered heat contributes to dry the blocks. The blocks are next barded in the drying chamber or furnace to which the truck is conveyed.

1,718.—TRAPS FOR GULLIES: A. S. Chadwick.—The rectangular gully has a top of which the sides are directed inwards down to a middle channel that communicates with the outlet. Besides the customary grating in the top of the gully, another grating is fitted over the outlet.

MEETINGS.

SATURDAY, MAY 25.

Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilization in Egypt." III. 3 p.m. British Institute of Certified Carpenters.—Visit to the Royal Masonic School at Bushey. Meet in Central Hall, Euston Station. Train leaves Euston 2.40 p.m.

THURSDAY, MAY 24.

Surveyors' Institution.—Country meeting at Southampton Institution of Electrical Engineers.—Annual general meeting to receive Annual Report of Council and statement of accounts and balance-sheet for twelve months terminated December, 1900. The announcement of the election of the new Council will be made at this meeting. 8 p.m. FRIDAY, MAY 31.

Architectural Association.—Annual dinner, Criterion Restaurant, Piccadilly-circus, 7.30 p.m. Surveyors' Institution.—Country meeting at Southampton (concluded).

SATURDAY, JUNE 1.

Edinburgh Architectural Association.—Visits to the Round Tower, Abernethy; and Balmano Castle. Association of Municipal and County Engineers.—Home District meeting, Chichester. Mr. J. Saunders on "Municipal Work in Chichester."

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Table listing property sales with columns for date, agent, and details of the property including location, area, and price.

Table listing property sales with columns for location, agent, and details of the property including location, area, and price.

Table of property listings including addresses, descriptions, and prices. Examples: Camberwell, Linnell-rd., u.t. 6 1/2 yrs., g.r. 64, r. 304; City of London, Paternoster-row, area 724 ft. f.; Twickenham, May-rd., a block of building land, f.;

Table of property listings by T. G. Wharton. Examples: Hendon, Milton-rd., f.g.r.'s 421, reversion in 81 yrs.; Albion-villas, f.g.r.'s 301, reversion in 80 yrs.; Finsbury Park, 33, Portland-rd., u.t. 57 yrs., g.r. 121, 128, r. 551;

Section titled 'PRICES CURRENT OF MATERIALS.' with a note: '*Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.'

Table of material prices including Bricks, Hard Stocks, Rongh Stocks, and various types of Bricks (Glazed, White, Ivory, etc.) with prices per 1,000 or per load.

Table of material prices including Stone (Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Grinshill, etc.) and Slates (in. in, 20x10 best blue Bangor, etc.).

Table of material prices including Joists, Girders, Rolled Steel Joists, Compound Girders, Angles, Tees and Channels, Fitch Plates, Cast Iron Columns, etc.

Table titled 'PRICES CURRENT (Continued)' with a sub-section 'TILES.' listing various tile types and prices per 1,000 or per doz.

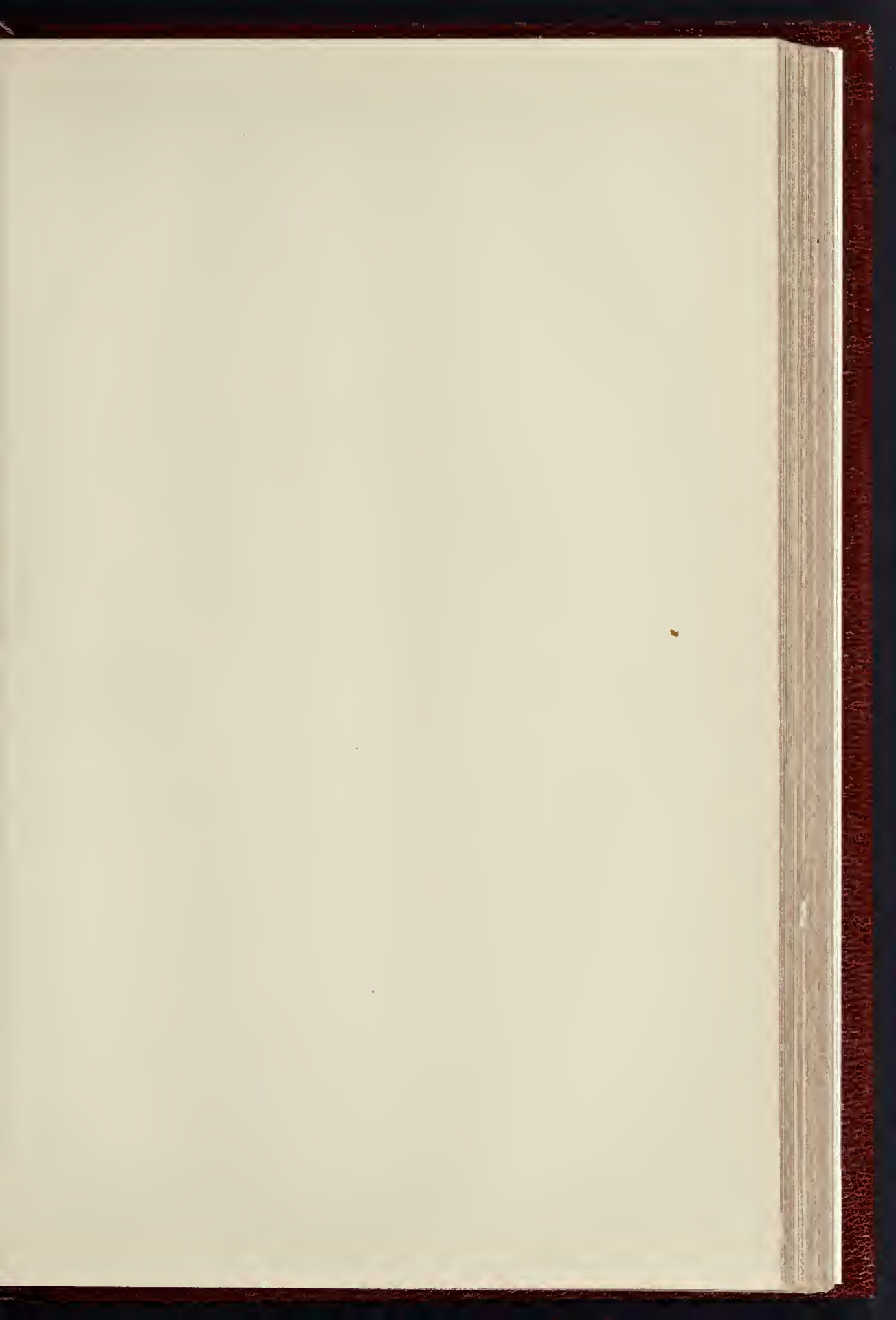
Table titled 'BUILDING WOOD—YELLOW.' listing various wood types and prices per standard load.

Table titled 'Fir timber: Best middling Danzig or Memel (average specification)' listing various wood types and prices per load of 50 ft.

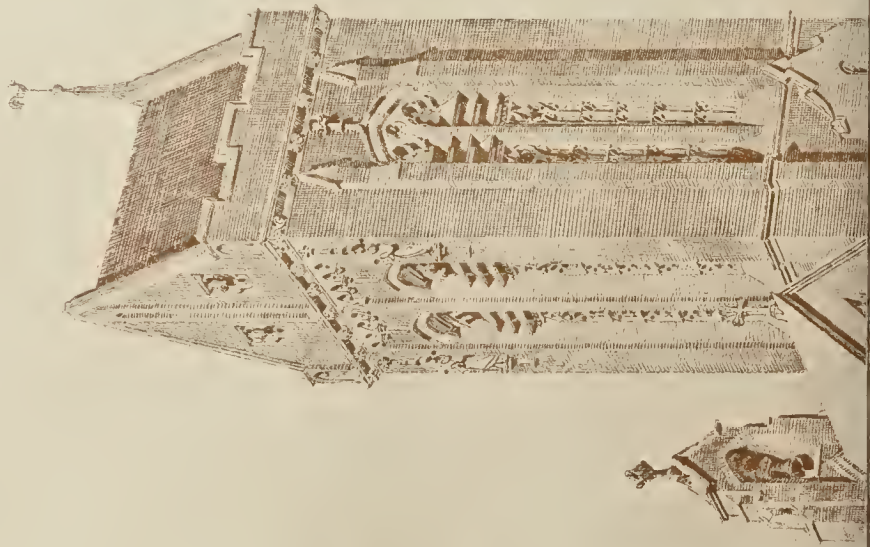
Table titled 'White Pine' listing various wood types and prices per standard load.

Table titled 'Dry Mabogany' listing various wood types and prices per standard load.

Table titled 'Prepared Flooring' listing various wood types and prices per square.



THE BUILDER, MAY 25, 1901

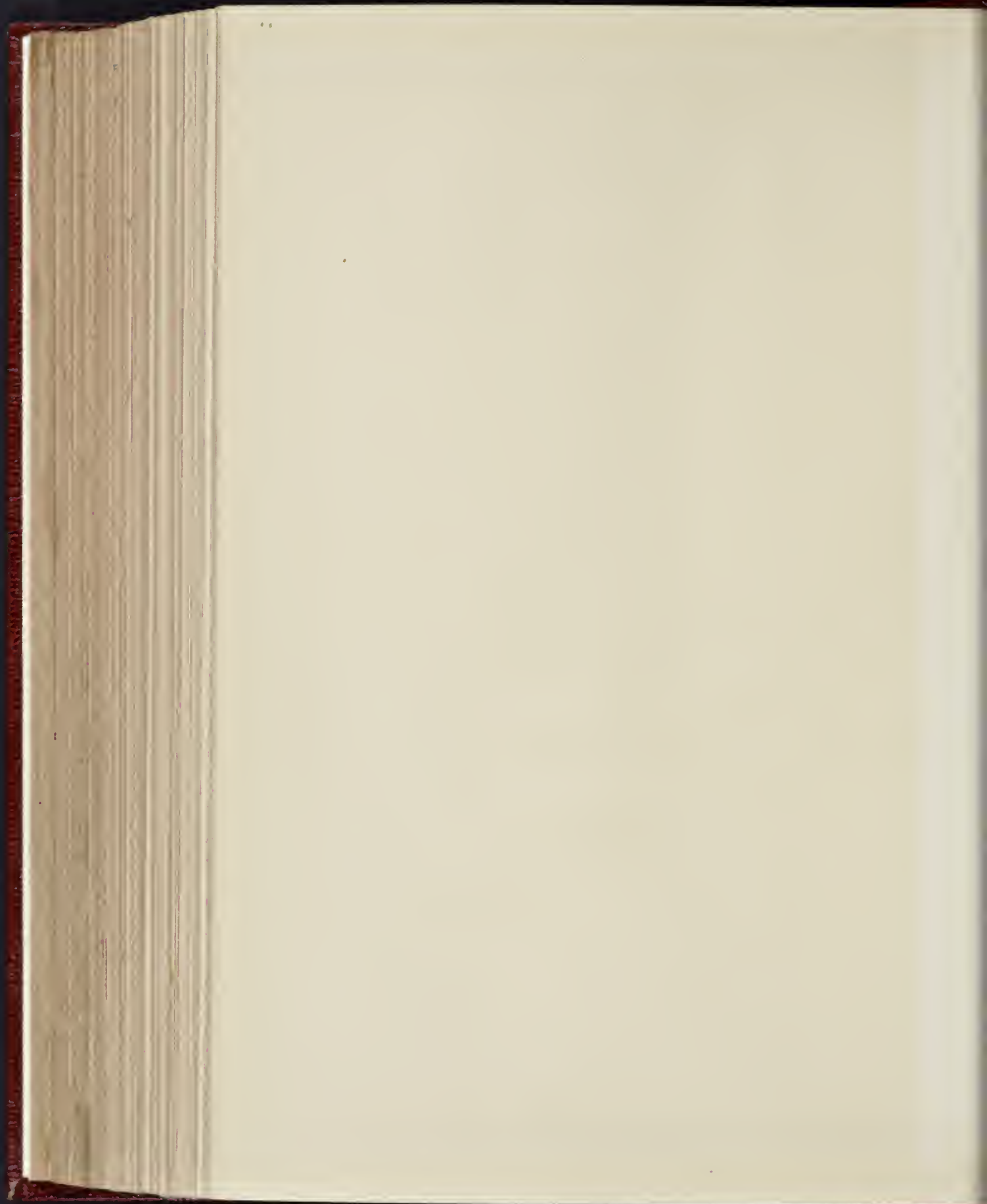


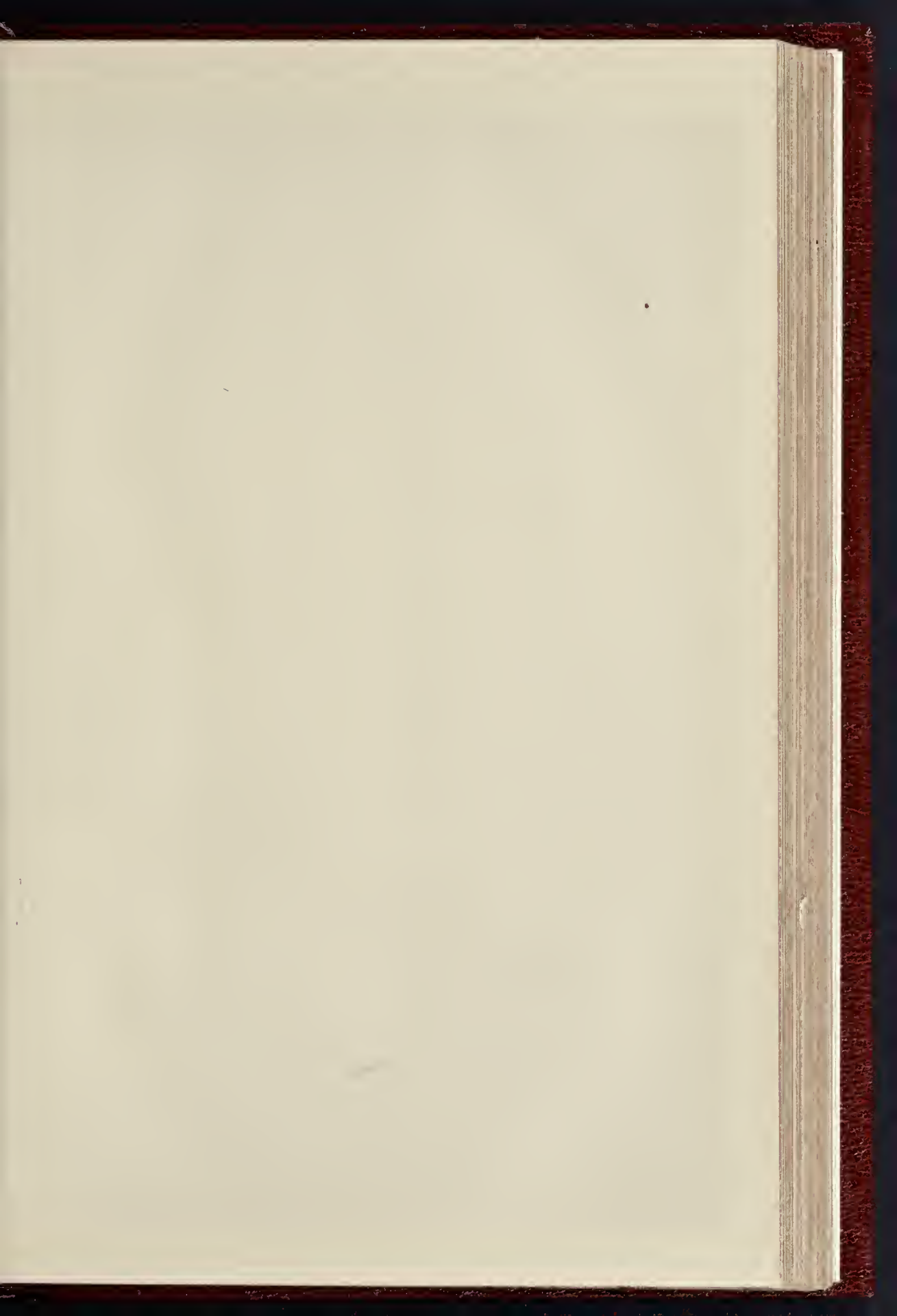


W. D. Clarke
1880
1890

C. M. E. 1891

INK PHOTO SPRAGUE & CO. LONDON 44 S. EAST HARDING STREET, PETER LANE, E.C.







RIMINI CATHEDRAL



INK PHOTO SPRAUE 4 C 1 4 5 EAST HARDING 1 REET PETER LANC E



PRICES CURRENT (Continued).

METALS.

Table listing various metals and their prices per ton in London. Includes categories like Common Bars, Staffordshire Crown Bars, Mild Steel Bars, Hoop Iron, Sheet Iron, Galvanized Sheets, and Brass.

ENGLISH SHEET GLASS IN CRATES.

Table listing English sheet glass in crates with specifications like 15 oz. fourths, 21 oz. fourths, etc., and prices per ft. delivered.

OILS, &c.

Table listing various oils and their prices per gallon. Includes Raw Lined Oil, Turpentine, and Genuine Ground English White Lead.

VARNISHES, &c.

Table listing various varnishes and their prices per gallon. Includes Fine Elastic Copal Varnish, Best Elastic Carriage Varnish, etc.

TO CORRESPONDENTS.

Notice to correspondents regarding the submission of articles, letters, and communications to THE BUILDER.

TENDERS.

General notice regarding tenders for construction work, including instructions on how to submit and accept bids.

Notices for tenders in AUCHTERLESS (N.B.), CASHMIE STEADING, and BLACKBURN, detailing the work to be done and the contractors involved.

Notice for a tender in BRAY (co. Wicklow, Ireland) for the erection of a summer residence in cement.

Notice for tenders in CHELMSFORD for alterations to the Clerk of Peace Office, including details on the work and the contractor.

Notice for a tender in COLEORTON for a new Primitive Methodist church, including details on the site and the contractor.

Notice for tenders in DISS (Norfolk) for the erection of two villas and six cottages on Victoria-road.

Notice for tenders in EALING for finishing and decorating four houses, including details on the work and the contractor.

Notice for a tender in ESHER for the erection of a private residence, including details on the work and the contractor.

Notice for tenders in FOXROCK (co. Dublin, Ireland) for the erection of twelve artisans one-story cottages.

Notice for tenders in FRAMPTON-ON-SEVERN for alterations and additions to Buckholdt House.

Notice for a tender in HAROLD WOOD (Essex) for the erection of a detached house, including details on the work and the contractor.

Notice for tenders in HUNSTANTON (Norfolk) for work at Florence Villa, including details on the work and the contractor.

Notice for tenders in KEIGHLEY for the erection of a house, stables, and sanitary depot, including details on the work and the contractor.

Notice for tenders in KELVEDON (Essex) for the erection of eight cottages in concrete.

Notice for tenders in KINGSASH (Bucks) for alterations at farm, including details on the work and the contractor.

Notice for tenders in KINGSWOOD for the erection of cottages for Mr. A. L. Liberty.

Notice for tenders in LEYTON for shop-fittings, including details on the work and the contractor.

Notice for tenders in LEYTONSTONE for shop fittings, including details on the work and the contractor.

Notice for tenders in LICHFIELD for the erection of a school, house, and borrowcop hill.

Notice for tenders in LONDON for alterations and additions to Town Hall, Rosebery-avenue.

Notice for tenders in LONDON for new drainage, latrines, roadway, and navigation company.

Notice for tenders in LONDON for building new stores and stables at Kieselquhr Wharf.

Notice for tenders in LONDON for shop fittings, including details on the work and the contractor.

Notice for tenders in LONDON for the erection of the Imperial Hall, Grove Vale.

Notice for tenders in LUTON for the erection of children's homes, including details on the work and the contractor.

Notice for tenders in NORTHWOOD for the erection of private residence for Mr. J. Llewellyn.

Notice for tenders in NOTTINGHAM for the erection of a pair of villas, including details on the work and the contractor.

Notice for tenders in PENTRE (Glam.) for the erection of the Hope English Baptist Chapel.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

CONTRACTS.			
Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Twenty-one Cottages	Rathdown (Ireland) R.D.C.	R. M. Butler, Architect, Dawson-street, Dublin	May 28
Flooring, &c.	Rochdale Corporation	S. S. Platt, Civil Engineer, Town Hall, Rochdale	do.
Additions to the Royal Belfast Institution, Belfast	Governors	Blackwood & Jury, Architects, 41, Donegal-place, Belfast	do.
Paving Works, Church Bank	Sowbery Bridge U.D.C.	R. W. Evans, Commercial Bank Chambers, Halifax	do.
Railings and Gates	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
Road Making and Paving Works	Wandsworth & Clapham Guardians	C. A. Sharp, Architect, 11, Old Queen-st., Queen Anne's Gate, S.W.	May 29
Granite Road Metal (1,165 tons)	Thame (Oxon) U.D.C.	H. Howland, Surveyor, 33, Chinnor-road, Thame	do.
Additions to Workhouse	Rathdown Union Guardians	P. F. Comber, Civil Engineer, 13, Lower Leeson-street, Dublin	do.
Chapel	Belfast Corporation	City Surveyor, Town Hall, Belfast	do.
Restoration of Chapel, Llywmmawr, Glyn Ceirlog	Barrow-in-Furness Guardians	J. Y. McIntosh, Architect, Cornwallis-street, Barrow	do.
Fourteen Cottages	North Dublin R.D.C.	H. Evans, Glanryon, Pontfadog, Ruabon	do.
School, Framlingham, Suffolk	Erdington U.D.C.	J. G. Neill, North Brunswick	do.
Road Works, &c., Deykin-avenue	Islington Guardians	H. H. Humphries, Engineer, Public Hall, Erdington, Birmingham	do.
Painting, &c.	Hampstead Borough Council	Guardians School, Hornsey-road, N.	May 30
Wood Paving, &c.	Rev. J. McGlinchey	Borough Surveyor, Town Hall, Haverstock Hill, N.W.	do.
Parochial House, Donemana, Ireland	Mr. J. Bowden	E. J. Toye, Architect, Strand, London	do.
Two Residences, Wyke, Bradford, Yorks	Brighton Borough Council	Bryshaw & Dixon, Architects, Bowling Old-lane, Bradford	do.
Two Shops, &c., Croft-road, Neath	Stirlingshire County Council	J. C. Rees, Architect, Neath	do.
Portland Cement	Edenderry (Ireland) R.D.C.	Borough Engineer, Town Hall, Brighton	May 31
Reservoir, &c., Milton	Braidwood (N.B.) Town Council	Warren & Stuart, Civil Engineers, 94, Hope-street, Glasgow	do.
Labourers' Cottages	Little Woolton U.D.C.	W. L. Palmer, 24, Quarry-street, Edenderry	do.
Cattle House, Gear, Zennor, Cornwall	Newcastle-on-Tyne Corporation	T. & J. Laity, Retailack, Marazion	do.
Cast-iron Pipes, &c.	Ulster Bank, Limited	Warren & Stuart, Civil Engineers, 94, Hope-street, Glasgow	do.
Art Gallery, Newcastle	St. Marybone Borough Council	Cackett & Dick, Archts., 24, Grainger-st. West, Newcastle-on-Tyne	do.
House, near Darvel, Hamilton, N.B.	Saffron Walden Corporation	W. T. Allen, Architect, 24, Quarry-street, Edenderry	do.
Hall, Clough, do. Down	St. Marybone Borough Council	Blackwood & Jury, Architects, 41, Donegal-place, Belfast	do.
Surveyor's Materials	Saffron Walden Corporation	R. Simmons, Surveyor, Grange-lane, Gateacre, near Liverpool	do.
Pumping Station Buildings	St. Marybone Borough Council	C. Hopkinson, Engineer, 23, Princess-street, Manchester	do.
Bank Premises, York-street, Belfast	Saffron Walden Corporation	Lepper & Fennell, Architects, 33, Waring-street, Belfast	do.
Gymnasium, Aberlillery	St. Marybone Borough Council	F. E. Bates, Architect, 26, Westgate-chambers, Newport, Mon.	do.
Two Cottages, Cornton, near Cornwood, Devon	Saffron Walden Corporation	Girdrieve & Kingston, Bridgetown, Totnes	June 1
Additions to National Schools, Hayling Island	St. Marybone Borough Council	H. F. Triggs, Architect, South Bayling	do.
Granite Road Metal (500 tons)	Saffron Walden Corporation	A. H. Forbes, Borough Surveyor, Town Hall, Saffron Walden	do.
Paving Blocks	St. Marybone Borough Council	Borough Surveyor, Town Hall, Marylebone-lane, W.	June 3
School Buildings, Denbigh	Saffron Walden Corporation	J. Hughes, Architect, Denbigh	do.
Bridge Works, Broughton-road	Swansea Corporation	C. S. Allott & Sons, Civil Engineers, 45, Brown-street, Manchester	do.
Workshop, &c., Mount Pleasant	Bedwellty School Board	W. James, Grammar School, Swansea	do.
Additions to School, Pontycof	Messrs. Siemens Bros. & Co., Ltd.	C. Dauncy, Castle-street, Tredgar	do.
Electrical Engineering Works, Stafford	Trinity House Corporation	Siemens & Co., Ltd., Woodwich	do.
Dwellings, &c., Penice Point, Cawsand, Cornwall	Gloucester School Board	E. G. Verity, 31, Golden-square, W.	do.
School, Linden-road	Billerica R.D.C.	M. H. Medland, Architect, 15, Clarence-street, Gloucester	do.
Sewers	Stratford-on-Avon School Board	Bailey Denton, Son, & Lawford, 9, Bridge-street, Westminster	do.
Teacher's House	Messrs. Welsh & Company, Ltd.	T. T. Allen, Architect, Stratford-on-Avon	June 4
Two Cottages, &c., to Public House, Winchester	Aldershot U.D.C.	T. Stophar, Architect, 57, High-street, Winchester	do.
Electric Lighting Buildings	Hove Corporation	N. F. Dennis, Civil Engineer, Council Offices, Aldershot	do.
Underground Lavatories	Melton Mowbray U.D.C.	Borough Surveyor, Town Hall, Hove	June 5
Sewer Works	Cheadle R.D.C.	Baldwin Latham, Parliament Mansions, Victoria-street, S.W.	do.
Conduits, Drains, &c.	Uxbridge Station Supply Co., Ltd.	F. T. Inskip, Surveyor, Brookhouse, Cheade	June 6
Waterworks, &c.	Rochford R.D.C.	Secretary's Office, 1, Vine-street, Uxbridge	do.
Generating Station	Shardlow Hospital Committee	J. Mansergh, Engineer, 5, Victoria-street, Westminster	June 10
Water Tower, &c.	Exeter Town Council	F. S. Andliff, Architect, Draycott	June 12
Hospital	Dagenham School Board	D. Cameron, City Engineer, Exeter	June 14
Electricity Buildings	Messrs. C. Rowe & Company, Ltd.	Harrington & Ley, 65, Bishopgate-street, Without	June 19
School	Stratford-on-Avon School Board	Corson & Co., Architects, 25, Cookridge-street, Leeds	No date
Warehouse, Leeds	Messrs. Nicholl & Co.	T. T. Allen, Architect, Stratford-on-Avon	do.
House, Longtown, Carlisle	Messrs. Nicholl & Co.	J. W. Starr, Architect, Colchester	do.
Additions, &c., to the Garland Hotel, Parkston	Messrs. Nicholl & Co.	Moulds & Porritt, Architects, 77, Kings-street, Manchester	do.
School, Eyns-street, Penelton, Lancs	Abersychan Indus. Co-op. Soc. Ltd.	J. Dibbens, Glyneth-road, Dorchester	do.
House, Piddletroughside, Dorset	Mr. T. E. Yorke	Sesh & Bain, Architects, Midland Bank Chambers, Newport Mon.	do.
Hall, &c.	Harrowgate Corporation	Bland & Brown, Architects, Harrogate	do.
Works at Farn, Goutswale, Yorks	Mr. J. H. Brown	A. A. Gibson, Architect, 5, Prospect-crescent, Harrogate	do.
Caretaker's House, Scargill	Messrs. Greene, King & Co., Ltd.	G. H. Johnson, Architect, 33, High-street, Rotherham	do.
House, Langcliffe Avenue, Harrogate	Messrs. Aylmer & Coghlin	A. A. Hunt, Architect, 51, Abbeygate-street, Bury St. Edmunds	do.
Alterations to Rother Cottage, Rotherham	Gateshead School Board	A. Hill, Architect, 22, George-street, Cork	do.
Additions to the Castle Inn, Bury St. Edmunds		J. Foster, Brownlow-road, Eilemsere, Salop	do.
Additions to the Red House and Tally Ho, Cork		F. W. Purser, Architect, West-street, Gateshead	do.
Villa, Eilemsere, Salop			
Schools, Sunderland-road			

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Building Inspector	Coventry Corporation	130l. per annum	May 30
*Assistants (2)	Hendon R.D.C.	2l. each per week	June 5
*Manager	Sheffield Corporation	.....	do.
*County Surveyor	Northampton County Council	350l. per annum	June 7
*Clerk of Works	Worthing School Board	.....	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. — Contracts, pp. lv. vi. viii. x. & xxiii. Public Appointments, pp. xxi. & xxiii.

SHIMPLING (Norfolk).—For the erection of four cottages for Mr. J. C. Keen. Mr. Henry Geo. Bishop, architect, Stowmarket, Suffolk.—
J. Wade, Long Stratton*£550

SOUTHMINSTER (Essex).—For the erection of a house for Mr. H. J. Summers:—
A. Downing, Southminster*£454

THAKEHAM (Sussex).—For the erection of a police-station, for the West Sussex County Council. Mr. W. B. Purser, C. E., 31, Bedford-road, Horsham. Quantities by Mr. C. H. Barnow, architect, Horsham.—
W. Wallis.....£655 0 0 | H. Murrell,
Geo. Gillam... 653 5 3 | Roffey, Hors-
ham*£611 0 0

THAMES DITTON.—For the erection of a cottage shop for Colonel Walter Campbell. Mr. A. J. Hardwick, architect, Kingston-on-Thames:—
T. Adkins£594 7 0

WESTCLIFFE-ON-SEA.—For the erection of a pair of villas on the Beach Estate. Messrs. Clare & Ross, architects, Chelmsford and London:—
Young & Co., Plaistow, E.*£820

WIMBLEDON PARK.—For the erection of a detached house. Messrs. Clare & Ross, architects, Chelmsford:—
W. & C. Brown, Clapham (tender on amended plans)*£1,110

LONDON SCHOOL BOARD TENDERS.
At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

BALTIC-STREET SCHOOL, BARBICAN.—Sanitary work:—
Williams & Son ..£262 0 | Johnson & Co.£200 0
Stevens Bros. 210 10 | Marchant & Hirst 129 0

BEEETHOVEN STREET SCHOOL, QUEEN'S PARK.—For sanitary and drainage works:—
Gordon & Sons, 51, 453 0 0 | G. Neal£1,152 0 0
Killingback & R. P. Beattie 1,120 12 3
Co. 1,296 0 0 | John Peattie 899 0 0
W. Hammond 1,282 0 0

BEEHOVEN-STREET SCHOOL, QUEEN'S PARK.—Works in infants' department already sanctioned...

BERGER-ROAD SCHOOL, HOMERTON (for special school, &c.).—The Board on April 5, 1900, on the recommendation of the School Management Committee...

BLOOMFIELD-ROAD SCHOOL, PLUMSTEAD.—Special rooms:—H. Groves.....£1,129 | G. Kempf.....£1,133

BOSTALL-LANE SITE, PLUMSTEAD.—A school on the site in Bostall-lane, Plumstead (Sub-division 5 of Greenwich), to provide accommodation for 1,006 children...

J. & M. Patrick.....£30,435 + £211 Johnson & Co., Ltd..... 30,278 + 208 Gough & Co..... 29,668 + 287 Lathey Bros..... 29,575 + 342

CATHERINE-STREET SCHOOL, HXONTON.—For re-constructing boiler flue:—Merchant & Hirst.....£139 0 0

CHEQUER-STREET SCHOOL, ST. LUKE'S.—For new offices, &c.:—Peattie Bros.....£380 0 0

COOKS' GROUND SCHOOL, CHELSEA.—For additional heating surface:—Vaughan & Brown, Ltd.....£84

HILLDROPP-ROAD SITE, CAMDEN-ROAD.—With the consent of the Board of Education, the Board have acquired a site in Hilldropp-road, Camden-road (Sub-division BA of Finsbury); and on March 7, 1901, the Board, on the recommendation of the School Management Committee, instructed the Works Committee to erect on this site a Pupil Teachers' School for the Marylebone Division, at an estimated cost of £1,484.

LAVENDER HILL SCHOOL.—For new drawing-classroom, modelling room, &c.:—H. & F. Higgs.....£1,567

LILLIE-ROAD SCHOOL, FULHAM.—For cloak-room, &c., for backward children:—Mison & Co.....£250 | J. & W. T. Hunter.....£135

MANCHESTER-STREET SCHOOL, GRAY'S INN-ROAD.—For heating works:—Kite & Co.....£598 | Knight & Sons.....£625

NEW SCHOOL IN MANDEVILLE STREET, CLAPTON.—For heating apparatus:—J. & F. May.....£2,792 | Brightside Foundry & Cannon & Sons..... 750

OXFORD-GARDENS SCHOOL, NOTTING HILL.—For heating apparatus:—J. & F. May.....£774 | G. Davis.....£250

PROSPECT-TERRACE SCHOOL, GRAY'S INN-ROAD.—For improvements to heating apparatus:—Brightside Foundry & Engineering.....£217 0 0

ROSEBERY AVENUE SCHOOL, GRAY'S INN-ROAD, AND BERNER-STREET SCHOOL, ST. GEORGE'S-IN-THE-EAST.—For covered playgrounds for infants:—

(A) Finsbury—Rosebery-avenue School. Johnson & Co.....£266 0 0 | Staines & Son.....£218 0 0

(B) Tower Hamlets—Bernier-street School. Johnson & Co.....£259 0 0 | G. Barker.....£212 0 0

RUTLAND-STREET SCHOOL, MILE END OLD TOWN.—Fitting up house, No. 29, Sidney-square, for housewifery centre:—Gibb & Co.....£92 | J. F. Holliday.....£80

SUNNER AVENUE PUPIL TEACHERS' SCHOOL, PECKHAM.—Heating works:—Brightside Foundry & Engineering.....£126 0 0

SURNEY-SQUARE SCHOOL, OLD KENT-ROAD.—For sanitary and drainage works:—Estimate, Additional including sum required using existing quired if doors and new joinery framework, he supplied.

Martin, Wells, & Co.....£2,821 0 0 | £3,057 0 8 Maxwell Bros., Ltd..... 2,548 17 160 16 8 | 3,713 17 8

WEST HILL SITE (late Bromhill-road), WANDSWORTH.—The Board of Education have sanctioned the erection of a school on the West Hill site, Bromhill-road, Wandsworth (Sub-Division CA of West Lambeth), to provide accommodation for 900 children, upon which site three temporary iron buildings have been now erected and are now in use.

WICKHAM-LANE SITE, PLUMSTEAD.—The Board of Education have also sanctioned the erection of a school for 600 children on the site which has been acquired in Wickham-lane, Plumstead (Sub-division S of Greenwich). Finished plans of a school to provide accommodation for this number of places (viz., boys, girls, and infants 200 each) were passed by the Committee on January 25. The school is a three-story building, and contains the following accommodation:—Halls—boys', girls', and infants', each 54 ft. by 31 ft. 3 in. Classrooms—boys', girls', and infants', each 56, 56, 48, 40; also drawing-classroom, 1,050 sq. ft. area. Heating by low-pressure hot-water apparatus and open fires. Area of site, 5,445 sq. ft. Playgrounds, area per child—boys', 254, 450 square feet, and infants, about 60 ft. A schoolkeeper's house is also included in the plans:—

WINSTANLEY-ROAD SCHOOL, BATTERSEA. For heating works:—Brightside Foundry and Engineering.....£438 0 0

WOODS-ROAD SCHOOL, PECKHAM.—This school is one of those in connexion with which it is proposed to provide halls and to carry out other improvements, under the scheme adopted by the Board on March 17, 1898, the finished plans of the improvements provide for a hall for each department, 53 ft. by 20 ft., with drawing-classroom over; new cloakrooms, teachers' room, stock rooms, and lavatories; dividing large classrooms and re-estepping five existing classrooms on each floor; providing basement for heating apparatus; enclosing, draining, and tarping the additional land; retaining and adapting old house for the schoolkeeper, and removing existing and erecting new covered playground for boys and girls and new water-closets for boys. The above alterations will result in a reduction of 150 places in the total accommodation of the school (viz., boys, 24; girls, 24; infants, 102), as the accommodation of the old rooms, the seating of which will be altered, will now be calculated on the seat basis. The revised accommodation, on the completion of the improvements, will be—boys, 456; girls, 456; infants, 536. Total, 1,448.—

Tenders for the supply of belts for the use of school-keepers when cleaning windows:—For 96 belts delivered At one time. Each. s. d. Sband, Mason, & Co..... 5 0 0

Painting, &c. The exteriors of the following schools will be painted between May 25 and June 25, 1900:—ARTHUR-STREET:—Martin, Wells, & Co.....£17 | H. Line.....£164

BLUNDELL-STREET:—C. & W. Hunnings.....£375 0 0 | Stevens Bros.....£281 0 0

CALVERT-ROAD:—W. J. Howie.....£175 10 0 | J. C. Bowyer.....£164 0 0

CAMDEN-STREET:—Balfour & Co.....£80 10 0 | Bristow & Eastwell.....£187 11 0

CATHERINE-STREET:—T. Cruys.....£58 0 0 | G. Barker.....£132 0 0

GIFFORD-STREET:—G. Barker.....£68 | Stevens Bros.....£598

[See also next page.]

For carrying out repairs on schedule in various groups.—The following are the particulars of the Tenders showing the percentage required by the contractors to be added to the printed schedule of prices, together with the percentage previously added:—

Name of Contractor.	City.	Finsbury.		Hackney.		Southwark.		Tower Hamlets.			
		Group 1.	Group 2.	Group 4.	Group 5.	Group 6.	Group 1.	Group 2.	Group 4.	Group 5.	Group 7.
H. Line.....	15	20	20	...	...	15	15	...	...	...
Barrett & Power.....	25	25	25	27½	27½	...	...	...	...	...
Lathey Bros.....	17½	17½	...	...	...	30	15	...	...	...
Marsland & Sons.....	25	25	...	...	...	...	...
G. Wales.....	40	40	...	...	...
J. Appleby.....	...	15½	...	...	...	...	...	...	...	...
T. L. Green.....	50	50	...	...	...
H. Groves.....	
Johnson & Co.....	...	*15	*15	25	25	15	15	20	20	20	
A. E. Symes.....	*17½	20	25	
J. Haydon.....	25	25	...	...	25	25	25	
Gibb & Co.....	...	35	35	...	...	...	...	25	25	25
Clarke & Bracey.....	75	125	125	125	125	
J. F. Holliday.....	125	125	...	...	...
Rice & Son.....	
M. Pearson.....	20	20	20	...	...	25	17	...	...	...
Sayer & Son.....	11	11	...	...	...
G. Brittain.....	27½	22½	...	...	...
W. V. Goad.....	20	20	...	...	...
Maxwell Bros., Ltd.....	

† This contractor requires an extra 12½ per cent. for sanitary works.
 ‡ These contractors require 33½ per cent. for sanitary works.
 The Works Committee recommend the acceptance of the Tender marked with an asterisk (*) in each case.

GILL-STREET:—

T. H. Jackson.....	£298	J. T. Robey.....	£141
A. W. Derby.....	193	Gibb & Co.....	129
Corfield & Co.....	168	J. Haydon.....	126

UPPER NORTH-STREET:—

T. H. Jackson.....	£206	Gibb & Co.....	£133
A. E. Symes.....	162	J. F. Holliday.....	131
A. W. Derby.....	150	Heard & Co.....	125
J. T. Robey.....	137	J. Haydon.....	114

LAXON-STREET:—

H. Line.....	£320	Sayer & Son.....	£223
Garrett & Son.....	269	Johnson & Co.....	218
Maxwell Bros., Ltd.....	228	H. J. Williams.....	210

RICARDO-STREET:—

T. H. Jackson.....	£218	J. T. Robey.....	£154
A. W. Derby.....	173	J. F. Holliday.....	152
Corfield & Co.....	154	Gibb & Co.....	139

ROCKINGHAM-STREET:—

Gregory & Co.....	£255	G. Kemp.....	£187
W. V. Goad.....	221	H. J. Williams.....	187
Sayer & Son.....	220	Johnson & Co.....	184
G. Brittain.....	195		15

STANLEY-STREET:—

S. E. Musgrove.....	£234	H. Groves.....	£185
J. & C. Bowyer.....	212	G. Kemp.....	175
Hayter & Son.....	190	E. Proctor.....	123

TOWER-STREET:—

Thompson & Beveridge.....	£215	Bristow & Eatwell.....	£127
C. Gurling.....	166	W. Hornett.....	125
Lathey Bros.....	166	M. Pearson.....	120
		S. Foiden.....	113

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The Builder.

VOL. LXXX.—No. 3043

JUNE 11, 1900.

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House at Barnt Green.—Messrs. Bateman & Bateman, Architects	Single-Page Ink-Photo.
House, Rosecroft Avenue, Hampstead.—Mr. C. H. B. Quennell, Architect	Single-Page Ink-Photo.
Proposed Church of St. Martin, Knowle.—Mr. H. Dare Bryan, Architect	Single-Page Ink-Photo.
New Lych Gate, Old Parish Church, Shanklin.—Mr. A. C. Blomfield, F.R.I.B.A., Architect	Single-Page Ink-Photo.
Royal Opera House, Covent Garden: Plan and Section. Mr. Edwin O. Sachs, Architect	Double-Page Photo-Litho.

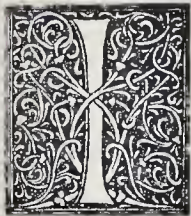
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Architecture of Sydney.



Nan article on the architecture of Sydney, which appeared a few months since,* we mentioned that there were a number of new buildings deserving of notice in addition to those we criticised, and promised to deal with them later on. One of the works specially noticed was the lightening of the Post Office and the difficulties of style in connexion therewith. A more satisfactory example is the Custom House, originally a plain, simple Italian building of three stories with projecting wings, recessed centre, and a loggia with granite columns on the ground floor filling up the recess. In its original form it was an unobtrusive, but satisfactory building, though in comparison with the huge wool stores of Messrs. Goldsborough, Mort, & Co. on the left, and with Harrison, Jones, & Devlin's on the right, it was quite insignificant. The imposition of an income-tax and a land-tax a few years since, and the simultaneous reduction of duties, caused the transference of staff from the Customs to the Direct Taxation Department, and one of the arguments put forward to gild the pill of direct taxation was the frequently repeated statement that the cost of collection would be less. It has, however, proved to be infinitely more, so much so that a very considerable enlargement of the Custom House became necessary, hence the recent alterations. These consist of the addition of two stories to the original building and of an Ionic colonnade of granite columns over the pre-existing Doric colonnade on the ground floor. Broadly and generally, the whole work is harmonious in itself, and the building now fairly holds its own with the wool stores on either hand. It is mainly erected in the golden brown sandstone for

which Sydney is famous, and forms a pleasing object from the Circular Quay, the central landing-place for passengers from most of the ferries and some of the mail steamers serving the city. There are, however, one or two points in the design open to criticism, and as our articles are intended to assist in the development of good architecture, we do not hesitate to point them out. The most noticeable is the very high panelled parapet to the wings, apparently equal in height to the attic story itself, in which also a panel treatment has been adopted. This equality of division and similarity of treatment is not pleasing (although each portion is in itself well designed), for it gives a generally top-heavy appearance to the wings, and the effect is still further intensified by the square dome-like terminals of the angle piers, from each of which rises a short flagstaff. If, instead of the square-domed terminals, some lighter treatment in metal or wood had been adopted as a support to the base of the flagstaff, the same general outline could have been obtained, but with a much more satisfactory result; in fact, the treatment should have formed a base to the flagstaff instead of a terminal to the stonework. The parapet to the recessed central portion consists of a turned balustrade of the usual type and of moderate height. If this had been carried round the wings instead of the high and heavy solid parapet, the effect would, we think, have been much more pleasing. Another slight defect is to be found in the cornice of the attic story, which is somewhat too pronounced in comparison with the main cornice immediately below it; and a very weak effect is given to the range of windows in the central division under the main cornice by flat corbelled pilaster strips between the windows. They would have been much better omitted, especially as there are two colonnaded loggias with strongly marked vertical lines just below them, and the contrast of horizontal treatment is exactly what was needed to give additional force to the colonnades. There is, however, one feature which calls for special

praise, and that is the enclosure of the clock, which occupies a central position in place of one of the windows. It is surrounded by a simple architectural framework almost square in outline, but with well-modelled dolphins as supporters to the circle, with tridents on each side to fill up the space left vacant by the curve of the body. This is a little bit of boldly and artistically treated work which gives genuine pleasure.

Passing up Pitt-street, we reach another building which has just been doubled in height, namely, the Merchants' Exchange. Originally, no doubt, it was an imposing building, but the growth of the city all round, and especially the erection of the huge Lands Office on one side, has left it secondary and insignificant. The original treatment consisted of a building of two stories on a fairly high base. The side elevations have slightly-projecting Corinthian pilasters, and five bays of the front are treated with three-quarter columns, with an entablature of good proportion all round. To add two more stories to such a building and make an architectural success is a task which requires some ability, and this, unfortunately, has not been displayed. The addition is practically a repetition of the two lower stories on a somewhat smaller scale, and with very poor and commonplace detail. The pilasters are thin and meagre, with exaggerated and nondescript caps and high bases. There is also too much cutting up of the surface between the pilasters by strings and bands. Windows with semicircular heads and square heads are also employed in the same range, the impost moulding to the former running through and cutting into the architraves of the square-headed windows—a most objectionable treatment, which makes the square-headed windows look very top-heavy. The three-quarter columns on the lower story are not carried up, but, nevertheless, a large and unmeaning pediment is superposed over three bays of the flat-looking pilasters previously referred to. It is a great pity that a building of such importance and in so good a position, with its three street frontages, should not have been

* See *Builder* of October 13, 1900.

more artistically treated; indeed, the building in its original condition was a much more satisfactory architectural composition, simple and unpretentious as it was, than it is now in its altered guise.

Away to the left up Bridge-street, at the corner where it joins Macquarie-street, is the Treasury, another old and commonplace building which has recently been enlarged by the Government Architect. This also presents a difficult problem, as it was apparently necessary to carry out the original commonplace design. It is a conspicuous example how a difficult problem may be met by genuine architectural skill, and an unpromising subject so manoeuvred that the eye is caught and held by an exceedingly well-designed feature to which the commonplace main lines of the building act as a foil. This feature consists of a projection of two stories thrown out from the front of the building right up to the pavement line. The upper half consists of a portico of three bays of coupled columns, those at the angles being square; they are of unpolished granite with bronze caps and bases, and are surmounted by a well-designed pediment. In this portion of the design the only points to criticise are the caps of the columns, which are somewhat too deep and heavy, and the acroteria which, though well carved, are too large, and, indeed, would have been better omitted altogether. The lower half of the projection forms a high base or podium, and on the face fronting the street is relieved by a semicircular arched opening of bold design, filled in with columns supporting the ground floor landing and a balcony wall wholly covered with carving of very fine design and good execution. The opening is treated in this fashion because the ground floor of the building is considerably elevated above the street, and approach thereto is obtained by well-designed flights of steps on either side. They are unequal in height, as the street has a steep slope, but being subordinate to the main central feature the discrepancy is scarcely noticed. The openings between the small columns in the arch just referred to give light to the basement story, and are filled in with some really excellent ironwork. Taken altogether the composition is one of the best bits of work the Government Architect has given us in recent years, excellent as most of his work is.

Returning to the heart of the city through the region of the clubs and hotels, we pass Dalgety's offices and those of the Australian Mortgage Company, which we criticised in our last article. Adjoining the latter a very ornate building in brick and stone has just been completed for the Jockey Club. The brick is tuck-pointed, the stonework is freely carved, and as much feature as a 30 ft. front could well contain has been lavished on this building. The general idea is not bad, namely, a wide central and narrow side bays subdivided by semi-ocagonal projections. On the ground floor at one side is the entrance, and at the other a passage way to the rear; an elliptical-headed window is placed between, over this is a well-marked square bay window with round corners, and above it on the second story a horseshoe arched opening with a rather heavy stone arch. Ordinary windows fill up the space in the side bays, and the parapet is cut up to give as much

variety of outline as possible. The whole design shows effort and the effect is overdone. It would almost appear as if the client said to the architect, "give us a good handsome front and don't hesitate about the expense." They have got it and it is to be hoped they are satisfied, but from the point of view of the artistic critic this is not the type of building one would care to see repeated, although, unfortunately, there are far too many attempts of the kind in the city. The building has, however, had one good effect, namely, that the somewhat bold stone building of the Mortgage Company adjoining has been greatly improved by the contrast, for its simple lines and the reticence of its design are accentuated, and its front has taken on an air of solidity and respectability which were not previously so noticeable, and should be gratifying not only to its architect but to its owner, as typifying the stability of their institution.

Making our way to the heart of the city, and leaving the General Post Office to the left, one of the most artistic of the warehouses of Sydney—that of Messrs. Paterson, Laing, & Bruce—has recently been added to and enlarged. The original design was very simple in its lines and boldly treated, as befitted a warehouse. It has a basement of rusticated stone with red brick for the walling over; there is no attempt at a cornice, but the original upper story is treated with a range of small windows divided by stumpy and bulbous polished granite columns, and the only projecting feature is a stone hood to the entrance. One cannot label the building as belonging to any special style of design; but, if anything, it is permeated by a slight feeling for the Romanesque. To this satisfactory front an upper story has recently been added, and here again the difficulties of such an addition are apparent. The original design was complete in itself, and it is hard to imagine any treatment that would not have detracted from the composition; as it is, it cannot be said that the upper story with its large semicircular arches is satisfactory. The extension on the Wynyard-square side is merely a repetition of the previous treatment and hence presents no difficulty; but the architect, Mr. Jeafferson Jackson, is certainly to be complimented on the artistic way in which he has incorporated the water tanks necessary for the supply of an installation of sprinklers throughout the interior. This takes the form of a small square tower with a tiled roof, and the perky way in which it stands up above the surrounding buildings is distinctly pleasing as well as amusing.

Passing along York-street, devoted to soft goods (*Anglice*, "Manchester") warehouses, one or two new ones are worthy of notice. The most elaborate is a block on the site of the old Skating Rink, and now being erected for a Melbourne capitalist. It is still incomplete, as one or two stories have yet to be added, but the fronts so far show an ample provision for light, which is one of the chief essentials for buildings of this class. The detail is Italian of somewhat ordinary character, very much moulded and carved, and we should imagine very much too fine in detail for the class of building intended, but it is hardly fair to criticise these buildings in their present incomplete condition. On the opposite side of the way is a very simple brick and stone warehouse for

Messrs. Inglis & Co., which has a distinctly warehouse look about it, and is yet artistic at the same time. It is six stories in height, and is divided by strings or cornices into three separate portions of two stories each. The chief defect is the equal division of the front, but this is somewhat neutralised by the two upper groups approximating in design, while the lower group is differentiated by the use of dark bricks with stone dressings to the windows. On the ground floor they consist of wide openings with strong segmental arches and pairs of windows over, all the arches being rounded. In the middle division red bricks are adopted with a few dark brick bands, and windows of ordinary size are spanned by segmental arches. In the upper group the centre is recessed 9 in., and red bricks only are employed. The general effect is fairly satisfactory, though for a warehouse of its type a somewhat bolder treatment of the window spaces would, we think, have been preferable. Adjoining is a long range of red brick stores for Lassetter & Co., in which a bolder treatment has been adopted, but it is unfortunately bald, mere utility evidently being the aim, so that the architect had probably no scope.

In this quarter of the city several other warehouses have recently been erected, but none of them call for any particular notice except one in Sussex-street occupied by Messrs. Yates & Co., the seed merchants, which in our opinion is far away the most artistic in the city. It has been built two or three years, and being in a very dirty quarter is already much discoloured. The frontage is a comparatively narrow one, and a large amount of light is essential, as the building is deep. This has been obtained by carrying up an arched recess nearly the whole height of the building, filled with windows, whilst solidity of effect is secured by the broad solid pier at the side, in which are single windows. The frieze-like treatment of the upper story binds the whole composition together, and the parapet of bricks in a diaper pattern carries out the general surface treatment of the front. The most noticeable feature of the latter is, however, the bands of light greenish grey tiles let into the brickwork, giving a distinctive character to the building. A further point for commendation is the honest treatment of the steel girders which carry the floors on the different stories over the windows, as they are boldly shown, and the bolts treated with ornamental washers. The whole of the upper part of the building is thoroughly satisfactory, but when we come to the ground story the composition is ruined by the hideously ugly wooden verandah, which a paternal City Council forces on every citizen who wants to make use of the footpath for the purpose of sheltering a shop window. This subject of street verandahs is a very difficult one. At one time any one could put up a design to suit his own building so long as it met with the approval of the City Architect. The majority under these circumstances were, of course, as cheap and commonplace as they could well be, but, on the other hand, some really good and well-designed verandahs were erected. For some years, however, the City Council has insisted on a settled design being followed, and being official it is necessarily common-place, and has to be

applied indiscriminately to all kinds of buildings. It is to be hoped that the new City Council will repeal this obnoxious by-law, and, while insisting on stability, will allow the architects of the city a free hand.

During the last two or three years quite a number of city buildings is the large number of hotels which have been re-erected, owing to the vigilance of the Licensing Authorities. Most of these are of commonplace character, but in some of them, while a simple design has been adopted, a certain amount of artistic effect has been secured by the disposition of the windows and the use of grey and red bricks in different portions of the front. Two occur to us at the moment, namely, at Church Hill and Oxford streets, in which not only simplicity, but fair treatment have been combined. No doubt there are many others worthy of notice. One, however, of very marked original character is to be seen opposite the Town Hall, and, together with a row of six shops adjoining, forms a group embodying several novel characteristics. The buildings are only three stories in height, one of which, the ground story, is completely hidden by one of the obnoxious City Council verandahs, though some little attempt appears to have been made in the columns to improve the design. The shop block is treated with recessed arches, the height of the two stories, containing windows the full width divided by stone mullions. The large tympana over the upper range of windows and the wall space between the upper and lower windows have been covered with majolica tiling. This is the first example we have noticed of the bold use of coloured tiles on the exterior of a building in Sydney, and the effect would have been very satisfactory if the colours of the lower band had been more harmonious with the tiles in the tympana. They are said to be the work of a celebrated London firm of potters. The hotel at the corner, instead of recessed arches, has projecting mullioned bay windows, but the wall spaces above and below are treated with well-modelled shields and other ornamental features in relief. A high parapet crowns the whole composition, and the division between the properties is only accentuated by short terminals.

To make up for the activity of the brewers the Church has not been idle, for the fine Roman Catholic Cathedral has during the last year or two been advanced one stage further towards its final completion. The recent work has consisted of the completion of the transepts, the pinnacled central tower, and of two bays of the nave, which, together with the completed choir, give the observer a fairly good general idea of what the building will eventually be like. The Cathedral possesses the inestimable advantage of a magnificent site, the finest in the city. It is on the highest ridge of ground, and is surrounded on all sides by open spaces, mostly park lands or reserves, so that it has no building to compete with it, and besides possesses the added advantage of trees and foliage as a background. The view from the ecclesiastical south-east, passing out of the gates of the Domain, is really fine, and reminds one rather of an old world edifice with its picturesque surroundings than of one in a new and bustling city in the Southern Hemisphere which, fifty years ago, was but little better than a small country town. The

original designs were prepared many years by the late highly-esteemed architect, Mr. W. W. Wardell, and, considering the disabilities of practice in these Colonies, they are a credit to his memory. The detail throughout is good and pure, though lacking the grace which belongs to the work of the acknowledged modern English masters of cathedral architecture, such as Street, Bodley, and Pearson. The general lines of the building, so far as they at present show, are English, as is also most of the detail. The broad and imposing transept, with its three entrances facing Hyde Park, is, however, rather Continental, and forms now, as it also probably will in the future, the principal entrance to the building. Adjoining this transept on the left is a chapel of two bays projecting beyond the choir aisle, but with no visible roof, a feature that is decidedly wanted to harmonise with the rest of the design. We understand that when the building is completed it is to have two western towers and spires, and that the nave will only be six bays in length, the same as the choir. If this is the case, the present satisfactory proportions will, we fear, be altogether spoiled, and we cannot help thinking that with such a short-naved building as this must be it would be far better to omit the western towers and carry up a central spire instead. Of course, it is a question whether the central tower piers would be strong enough to carry the superincumbent weight; but even if it is impossible to build a stone spire on the supports, one of wood covered with copper or lead would be preferable, or even none at all, rather than crowd the design and upset the balance of the composition by introducing unnecessary and undesirable features.

We cannot close this article without referring to the Federal Commemoration recently held in this city, for although the decorations were, of course, only temporary, they were in the main so good and so well thought out, that they deserve more than passing notice. The work was largely in the hands of Mr. Vernon, the Government Architect, who had the advantage of being present at the Jubilee of 1897 in London, and even took part therein as the officer in command of the New South Wales Lancers. The Venetian masts and interlaced festoons of St. James-square were reproduced in Martin's-place, and each street or section of a street was treated as a unit in the general design. Some of the sections were handed over to different nationalities, as the American, French, and German; and in these the national emblems of each predominated. A noticeable feature of the general street decorations was the use made of bright copper shields or discs on the Venetian poles, and also the rich stamped copper bands thereon, which formed the point of junction of flags and bunting. Many arches were also erected, viz., the Coal, Wool, Wheat, French, American, Melbourne, Commonwealth, German, and South Seas arches. The Commonwealth was an imitation of a Roman triumphal arch in fibrous plaster, enriched with paintings by local artists and large bronzed panels. The Melbourne was mostly of greenery and bunting, the American of wood, plaster, greenery, and bunting, and so on. The South Sea arch, by Mr. Vernon, was not an arch, but a pillared structure with a wide central opening and

entablature over, and perhaps the most artistic of any. The other arches were mostly the work of local architects. But the most novel feature was the treatment of Queen-square, with its many pillars and festoons, and the best the domed pavilion in the Centennial Park, in which the swearing-in ceremony took place. It is proposed to reproduce it in marble as a permanent memorial. The landing pavilion, a slighter structure on the shores of Farm Cove, was also very effective. But best of all was the street and park illumination at night, which for a week turned a comparatively dull and prosaic city into a fairyland of light and colour, and filled its streets with one of the most pleased and orderly crowds it has ever been our lot to see. Such a display cannot but have a good effect on the people at large, and awaken the latent artistic feeling of the masses to a perception of what Sydney might in some measure be made.

THE LATE MR. J. M. BRYDON.

THE sudden death of Mr. Brydon has been painfully felt in the architectural world of London, where he was known to many personally, as well as to every one by name. It is doubly sad that both the architects for the two great new blocks of Government offices should have died before the actual commencement of their buildings, just when each had attained, and might have hoped to enjoy, one of the greatest prizes of the profession. It seems only the other day that the two successful architects were celebrating their good fortune in a congenial manner by a joint dinner to their professional brethren; and now both are gone, and their work left to be carried out by other hands.

Mr. Brydon's success in his profession was a tolerably rapid one, for it can hardly be said to have commenced before the occasion of the Chelsea Vestry Hall competition in 1885. His design which was accepted on that occasion was evidently the outcome of a very careful study of the details and character of late English Renaissance; we should have been disposed to think that the church of St. Martin-in-the-Fields had largely influenced the design. The style of the building which Mr. Brydon produced on these lines was exactly suited to the *genius loci* of Chelsea, a fact which may have partly led to its selection; but it must have been also remarked that it showed a complete acquaintance with the character of detail of that school of English architecture. Whether this reproduction of the style of a past century is the object to be aimed at in a new building is of course a question—perhaps more than a question; the point to be noted is that Mr. Brydon did it thoroughly well, and established himself from that time as a Classic architect of training and knowledge. The lesson to young architects is that such complete study and comprehension of a special style is what often leads to the first step in professional success; but it must be complete. An architect may choose to strive for success by picturesqueness and originality of treatment, in which correctness of precedent is of no consequence, and so long as his picturesqueness is based on good planning, we should perhaps feel more sympathy with that kind of success than with the success of architecture founded on

precedent. But there is something to be said for precedent, especially when learnedly studied, and in this respect Mr. Brydon's Chelsea Vestry Hall was beyond criticism. He had caught the very spirit of the thing, and not merely some of its salient forms.

Hence it was a most natural and fitting sequel that he should have been employed so largely in erecting new buildings and enlarging and altering old ones at Bath, pre-eminently the home of English eighteenth-century architecture. The selection was generally approved, and the result fully justified it. Mr. Brydon's buildings at Bath are entirely in harmony with the Bath architecture to which Wood had given the tone; and this was a case in which anything other than this would have been entirely out of place. Bath is a city so peculiarly specialised in its architectural unity, largely the result of one man's influence, that it would have been a serious mistake to have obtruded into it prominent public buildings in a style out of harmony with the existing public and street architecture of the city. It was fortunate, therefore, that this work got placed in the hands of the architect who probably, better than any one else in England, understood that particular phase of English Classic.

Mr. Brydon had however carefully studied Italian as well as English Renaissance, and his studies in this field showed their result in his treatment of the Roman bath at Bath, in which he kept as carefully the character of Roman detail. Mr. Brydon was also exceedingly successful, in an artistic sense, in some competition designs in which he was not the selected architect. Among these may be mentioned his design for the West Ham Technical Institute, with its dome based more or less on the Radcliffe, and that for the Edinburgh Municipal Buildings, in which the lofty front towards Prince's-street was treated with much power. Some buildings on a smaller scale are interesting as showing suitable and characteristic treatment of a less ambitious kind; among them the Village Hall at Forest-row, a very pretty piece of rural architecture, and the residential chambers in Chenies-street, which, as a treatment of a plain and unpretending building, is one of the best and most suitable pieces of modern street architecture in London.

Mr. Brydon's design for the great building for the Government offices in Great George-street was, we confess, to some extent a disappointment to us; it has an excellent plan, and a fine feature in the circular internal court, but the general design of the exterior is rather correct than striking or impressive. Perhaps it may be said that this represents the nature of Mr. Brydon's talent as an architect; he was not an architectural genius, but a painstaking student who, if he adopted this or that school of architecture as a model, made himself thoroughly acquainted with it, and could be depended upon to treat it in an adequate manner. It was this conviction as to his thorough knowledge of Classic which no doubt led to the general feeling in his favour, on the part of his professional friends, in connexion with the Government Office Commission. In regard to this we may be excused, under the circumstances, for divulging a little incident which is not properly public property. The Government, as will be remembered, had asked the Institute to recommend eight architects who were especially competent in Classic design, from

among whom they would select their architects. There was a ballot in the Council of the Institute for the selection of these names, each member writing down on a piece of paper the names of the eight whom he preferred. When the papers were opened and read, the lists were very various, and Mr. Brydon's name was the only one which was included in all of them. He got on his feet and in a few words, spoken with a good deal of feeling, said that whether he became architect to the Government Offices or not, he should always remember with pride and pleasure the way in which his brethren had voted for him.

Mr. Brydon will be very much missed at the Institute of Architects, where he was an active and energetic member of the Council, taking the greatest interest especially in artistic questions, in regard to which he may be said to have represented enthusiasm guided and tempered by common sense. He made many useful suggestions in discussions on architectural and artistic subjects, and always seemed to see the real point of the matter in hand. In addition to this he was a man generally liked personally, for his pleasant and genial manner, and he leaves a gap in the ranks of the Institute which will not be easily filled.

NOTES.

Liverpool
Cathedral.

The *Liverpool Mercury* of May 28 publishes an interesting and able memorandum drawn up by Mr. George Bradbury, architect, and an ex-President of the Liverpool Architectural Society, on the subject of the three sites now in question for the Liverpool Cathedral, viz.: the site of the present St. Luke's Church; what is called the "Monument" site, in the wide space up London-road, in the centre of which a monument of no great importance now stands; and the St. James's Mount site, adjoining the St. James's cemetery. The St. Luke's site he dismisses because it would be too small for a cathedral without the purchase of six houses near the site; it would be too noisy; and he does not think that public opinion would sanction the destruction of St. Luke's Church. He says, and with this we quite agree, that "as a whole, this church has a fine architectural effect, and on that ground it would be a great pity to have it removed." The other objection which we mentioned—that the cathedral would be only partially seen up Bold-street (the Bond-street of Liverpool), just a corner of it appearing, instead of being central with the street, Mr. Bradbury seems to have overlooked; but it is a very important one in regard to architectural effect. The Monument site he considers also too noisy, an electric tram route running past it, and that property of some value would have to be acquired to extend it sufficiently.

"With regard to the architectural effect, it could be seen on three sides, and would have a very imposing appearance; but owing to the large amount of very small property with which it would be surrounded, it is doubtful whether the weekday or Sunday services conducted in that district would be largely attended by those who are able to support cathedral services."

In regard to this we may observe that the presence of small houses close to the great cathedrals in France is not considered any bar to their usefulness. Of course, if people want to regard a cathedral merely as a place of fashionable resort, it must be in a

fashionable quarter; but that seems a rather vulgar and not very religious view of the matter. The St. James's Mount site is large enough, and presents the advantage of a probable rock foundation not far below the surface; but those who know Liverpool well will probably agree with us that in an architectural sense it is a rather obscure and out-of-the-way site. We are still of opinion that, seeing that Liverpool has let slip the fine site originally proposed near St. George's Hall and the Free Library group, the Monument site, if liberally treated, affords the finest opportunity.

FROM a long communication by the Antiquities of Knossos. Mr. Arthur Evans to the *Times* of Tuesday, it seems that the discoveries amid the ruins of the palace at Knossos bid fair to be among the most sensational ever made by modern explorers. It appears now probable that the palace at Knossos was a small town in itself, with a considerable population of slaves and artisans. The materials used by the artists in their work have been discovered in some of the rooms unearthed; and a great amphora of a veined marble-like stone was found, with carved reliefs on it, and side by side with it a similar but smaller vase only roughed out. A more remarkable discovery was what Mr. Evans takes to be the royal draughtboard, with a framework of ivory, the surface of the board formed with a kind of mosaic of ivory, partly coated with gold, and with crystal plaques backed with silver and with blue enamel; one end of the board is decorated with medallions, and the whole enclosed in a frame of marguerites in relief, of ivory and crystal. But the most startling discovery, to our thinking, was that of a signet-ring impression showing a creature with a calf's head and hoofs and the legs of a man, seated on a kind of throne. Considering the legend of the Minotaur, this is a most extraordinary discovery, and points at all events to some contemporary belief in such a creature. Mr. Evans states that the extent of the ruins appears to be much greater than was at first supposed; so we do not know what more may yet come to light.

Wireless Telegraphy. The paper on "Syntonic Wireless Telegraphy," read by Mr. Marconi to the Society of Arts, was of the greatest interest to electricians, and marks an epoch in the development of space telegraphy. Mr. Marconi has practically abandoned his earlier system of untuned vibrations. The receivers he now uses will only respond to waves of definite wave lengths, and hence in one station we can have several instruments receiving messages from different transmitters at the same time. By this method it would be possible for a ship in a British fleet to signal to any other one without at the same time ringing up the instruments on board all the other ships, as it does at present. Mr. Marconi thinks that the days of untuned telegraphy are numbered. Apparently very little has been done as yet in the direction of guiding Hertzian waves in particular directions. The waves now spread out from the transmitting station in all directions, as light does from a beacon fire on the top of a hill, and hence the energy available in the waves at considerable distances from the source

must be excessively attenuated. Attempts have been made to apply the principle of the heliograph or the telescope to these rays, but the metal reflectors and the sulphur and other lenses used, although they are successful in the laboratory, are very little use for considerable distances. As Dr. Fleming stated, the question of the monopoly of the ether by the General Post Office will soon have to be decided, and perhaps in the future companies will have to register particular frequencies of vibration for their apparatus just as now they have to register telegraph addresses.

A REPORT to the Local Government Board by Dr. S. Monckton Copeman, on the sanitary circumstances and administration of the Borough of Boston, shows that this ancient town is in a very unsatisfactory state in regard to drainage. It appears that the sewage of the more central and oldest part of the town is taken by an ancient sewer called the Barditch, once open, now mostly covered. The whole of the sewage discharged into the Barditch passes from south to north, and is discharged into the river at a point just below the Grand Sluice, whence it has to flow back along the river throughout the whole length of the town, passing in its course all the houses and other buildings on the river bank. The head of water in the river at high tides is utilised for the flushing of a portion of the Barditch, the possibility of obtaining this periodical flushing having apparently been the reason for arranging that the flow of sewage should take place in the reverse direction to that which would appear most desirable. Three systems of sluice gates have been laid down, one at the head of the sewer, protected by a stout iron grating to prevent the entrance of solid floating bodies, a second at a point where the ditch passes close to the Market Place, and a third about 50 yards distant from its outfall.

"I was informed by the Dykereeve that on an average the water in the river was sufficiently high to be turned into the head of the sewer nine times a fortnight, though it would appear that actual flushing of the Barditch is not carried out as frequently as this. The method of performing the operation is to close the Market Place sluice, and open that at the sewer head, by which the upper portion of the sewer, forming roughly about half its length, is more or less filled with the river water. When such an amount of water as is considered sufficient has been admitted, the sluice at the sewer head is closed. The water that has been taken in, together with the contents of the sewer, is of necessity now held up until on the ebb the river has fallen sufficiently to render discharge from the outfall of the Barditch possible. The tide having fallen sufficiently, the two lower sluices are opened, when the lower half of the sewer is flushed out by the discharge of the water which had previously been penned up above the middle sluice. From the description given, it will be seen that for a considerable portion of each twelve hours the contents of the Barditch remain stagnant, and, as during these periods it is nevertheless receiving continuous additions of sewage matter through the contributory drains which join it at frequent points throughout its course, the pressure within it must be considerable at times, more especially as throughout its whole length no provision has been made for ventilation. . . . The smell when the manholes were unsealed was foul, particularly when the sluice at the sewer head was opened."

The other principal drain, the Bargate drain, is of somewhat the same character, with sluice gates, and is said to be extremely offensive in hot weather. According to the Report the great obstacle to amending the

condition of this drain is that joint action on the part of both Boston and Skirbeck is necessary if any useful result is to be obtained; but the two have never united in formulating and executing an adequate sewerage scheme.

DR. REECE'S Report to the Insanitary Devonshire Local Government Board on the sanitary circumstances of, and administration in the Northam Urban District, Devonshire, tells the common and often repeated story of inadequate scavenging and polluted water. The water supply of the district for the greater part is derived from shallow wells. Some of these are only a few feet deep, mere holes excavated in the shillet; others have dry-steined walls, made of large-sized water-worn pebbles, apparently derived from the beach. For the most part these are to be seen at Appledore. From some wells the water is raised by means of a pump, or occasionally by any improvised arrangement, such as, e.g., an old meat tin lowered by a string. Many of these wells are so placed as to be liable to serious pollution. For instance, in a court at Appledore, a pebble-steined well was observed a few yards below certain privies and refuse tips.

"At a conference which I had with the then Sanitary Authority of Northam after my inspection in 1894, I urged the necessity of providing an adequate supply of wholesome water for each household in the district. And subsequently from time to time the Board wrote to the Sanitary Authority and their successors, the Urban District Council, inquiring what steps had been taken to provide a water supply for the district. The usual reply to such inquiries was to the effect that the matter was receiving consideration."

In regard to excrement disposal, there are a certain number of water-closets in Appledore. In the better-class houses these are placed inside the dwelling and are usually flushed with water from a rain-water tank, when this supply fails, hand-flushing is resorted to. Many of the houses are unprovided with water-closets or privy accommodation of any kind. Inquiries instituted at such houses revealed the fact that in some cases commodes were kept in the bedrooms, and that the contents of such were emptied on the beach at irregular intervals. In other instances people appear ordinarily to "use the beach," or in the event of the tide being up, or the weather bad, any other spot convenient for the purpose.

A FACULTY has been granted St. Andrew-by-the-Wardrobe Church, Queen Victoria-street, London, after Dr. Tristram, K.C., Chancellor of the Diocese, had inspected the church and churchyard, for laying out the steep incline of the burial ground on the southern side in terraces, and for lowering the height of the blank wall in order to replace it with a dwarf wall and a light ornamental railing, at an estimated cost of 450/., whereof all (10/ excepted) has been raised by the sale of a plot of ground belonging to the parish. The high wall was erected at the construction by the late Metropolitan Board of Works of Queen Victoria-street, which was completed in October, 1871. A portion of the graveyard was taken for the new thoroughfare. The church had been rebuilt upon a confined site at St. Andrew's (formerly Puddle Dock) Hill, after the Great Fire, of red brick with stone

dressings, by Wren, and finished in 1692, at a cost of 7,060/ 17s. for the united parishes of St. Andrew-by-the-Wardrobe and St. Ann, Blackfriars. The church, originally known as that of St. Andrew-juxta-Baynard's Castle, derived its later style from its proximity to the office and repository of the Master of the King's Wardrobe and store for the Sovereign's robes of state, established in a house built in Blackfriars by Sir John Beauchamp, K.G., a son of Guido, Earl of Warwick, whose heirs had sold the house to Edward III. Shakespeare cites the Wardrobe in his will. A MS. book of accounts preserved in the Harleian collection seems to show that the King occasionally sojourned there, and Richard III. sometimes held his Courts in the Wardrobe. Whilst presenting no very striking architectural features it has a pleasing interior, and the wreaths along the middle line of the panelled ceiling are beautifully carved. The portrait bust on the monument to the Rev. William Romaine (*obit* 1795) is by John Bacon the elder. The similar pyramidal monument to the Rev. William Goode is by John Bacon the younger.

Two artists, Mr. James J. Guthrie and Mr. Andreas D. Carse, have a small exhibition of work held at 4, Bloomsbury-square W.C.

We have seen Mr. Guthrie's black and white drawings in illustrated periodicals and it is interesting to see the original drawings of an artist with such strong individuality. The methods of these two artists are somewhat unusual, Mr. Guthrie using Chinese white on black paper and Mr. Carse making a number of little pictures on gesso, either black or coloured and worked with brush and knife. Mr. Carse's scene from "Paradise Lost" is fine drawing, it has the softness of charcoal and the richness of a pen drawing without the hardness of the latter; the method is one that lends itself to atmospheric effects and to a quality of largeness or breadth that gives these little panels a mark of permanency that is most unusual in this class of work. Very different are the designs of the same artist for the decorative treatment of interiors, which, when they miss being common-place, defy the canons of taste and design, proportion and form being forgotten for pretty colours and scraps of design. The best of Mr. Guthrie's drawings are perhaps the pair entitled "Morning Star" and "Morning," and his book plates are interesting in design and drawing, being, as they should be, rather beautiful badges than intricate pictures.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

CONTINUING the subject of designs which may be included under the class of public buildings or buildings for business purposes, we next come on a fine water-colour drawing showing Messrs. Henman & Cooper's "Royal Victoria Hospital, Belfast" (1,505), unfortunately without a plan, a matter all-important in this class of building. All we can say therefore is that the architects have succeeded in producing a bold effect of grouping with the wards of this hospital, but that is not what a hospital ought to be built for, and it is really absurd that a mere picture like this, of a building for a practical purpose, should be hung at all; it is not illustrating architecture. A triumphal arch, or even a church, may be considered as a piece of architectural grouping only, a hospital ought not to be; and if the subject were rightly understood at the Academy, drawings of either

dwelling-houses, hospitals, or schools, ought to be rejected if unaccompanied by a plan, as they certainly would be at Paris. We have harped on this string over and over again, but it seems useless; the architectural room at the Academy is obviously regarded, both by Academicians and by the majority of exhibitors, as an occasion for producing pretty pictures of buildings, in water-colour or in black and white: and that is not architecture.

Mr. W. Campbell Jones's "Parish Hall, St. Gabriels, Warwick-square" (1,504), is a very meritorious building of a simple and unpretending character. The double entrance doors, separated by a buttress over which is a niche with a statue, form a pretty incident in a building which is otherwise quite plain, but suitable for its purpose and position. Messrs. Briggs & Wolstenholme's "Blackburn Police Court and Sessions House" (1,602) shows no plan; it is a boldly-treated building with pavilions at each end crowned by cupolas, and a recessed wall with an order between. Messrs. Woodhouse & Willoughby also exhibit a perspective view (without plan) for the same building; either one or both of these is of course a competition drawing only, and ought to be so described in the catalogue; it does not seem quite straightforward for architects to exhibit a mere competition design with a title worded as if it were an actual building. This design is a weak and flat treatment of Classic features, which has not much to recommend it. Mr. Coates Carter's exhibit, No. 1,605, is honestly labelled "Design for a Public Building in a Hot Climate"; it has a good deal of merit; its special character lies mainly in the fact that the actual walls are entirely screened by an open arcade in the ground story and a columned loggia in the upper story; there is a certain appropriate suggestion of Oriental character in the detail, and the general effect is picturesque; but here again, no plan. Mr. Mountford's "New Premises in Cowcross-street" (1,610) is essentially a piece of street architecture—a treatment of a front wall, and therefore does not so much require a plan. As street architecture it is effective, but the pedimented windows in the first-floor story are surely rather heavy in mouldings and detail. The upper story is treated with small square windows with sculpture between, the whole forming a kind of frieze.

Messrs. Silcock & Reay's "British School, Trowbridge, Wilts" (1,614) shows a plan—hung too high to be well seen—and a boldly-treated brick building with stone dressings, with a small stone cupola forming a sky-line feature at each end of the façade; these may do to hang bells in, at all events there is that excuse for them. The large hall forms the central block, with a rather low-pitched roof over it; the classrooms, with their large windows, form a feature at the sides; the whole grouping grows out of the plan, and the character of the architecture is in keeping with the purpose of the building. Messrs. Pite & Balfour's premiated design (third premiated, more correctly) for the "Cartwright Memorial Hall" (1,618) is a severe Classic elevation drawn in very thick black lines; circular-headed windows between coupled columns on the ground story, an expanse of unbroken masonry above (where the picture gallery would come we presume); this is a broad and effective treatment arising out of the nature of the building: no plan. Mr. Ponting's "New Town Hall, Marlborough" (1,618: no plan), is on the type of the old-fashioned rectangular building doing duty as a town hall in so many small towns; it is mainly a red brick building with the upper portion of the walls treated in white cemented or plastered panels, and large mullioned windows. A stone *froulon* with a large balcony on massive cantilevers forms a feature at the entrance end; this portion is rather wanting in simplicity and does not harmonise with the rest. Mr. Tilmann's "Eastern District Hospital, Glasgow" (1,626) is shown in a drawing by Mr. Raffles-Dawson, with a block-plan added; it is in a rather peculiar style, the first-floor windows being partially Gothic in character, but with the small cornice characteristic of eighteenth-century buildings inserted both over the window and over the centre transom; there are largely boldly-spaced round arched windows in the ground story, while in the second-floor story there is a more Classic treatment with pilasters which spring from corbels under the string-course level; this

portion is rather out of keeping with the rest; too much emphasised in comparison with the plain nearly flat treatment of the lower portion.

There has been a good deal of discussion lately at Southampton as to what is to be done with the old Bargate, which as things are at present certainly merits its name as being a bar to traffic, for all the wheeled traffic at present has to pass under the not very wide central arch of the gate. Some vandals in Southampton have even wished to pull it down; but we hope nothing so stupid will be done. Mr. R. M. D. Lucas, an architect practising in Southampton, exhibits his scheme (1,635) for reconciling the demands of traffic with the preservation of the gate. He shows both plan and elevations. The central archway is reserved for tramway traffic; the present side arches are for other wheeled traffic, and, as we make out from the plan and elevations, two new arches are proposed for foot traffic, partly through existing property adjoining the arch, and which are to be treated in a manner to harmonise with the ancient structure. The scheme seems a good one, and ought to have attention.

Mr. E. P. Warren's "Bedales School, Petersfield" (1,632) is shown in a rather roughly-drawn pencil perspective, with a small plan in the corner. It is a quadrangle plan—the most picturesque but not the most healthy plan for a school, with a cloister round two sides of the quad; the architecture is, evidently with purpose, the simplest possible, with rectangular windows with small panes; a large oriel, which appropriately marks the end of the hall, is the only feature that can be called architectural in the usual sense of the word. The general effect is that of a simple, quiet and home-like school. A large and important drawing is that exhibited by Mr. Clyde Young of the John-street front of the Glasgow Municipal Buildings (1,638); it does not represent any new work, but is only a new view, and is a very fine drawing giving the greatest possible effect to one portion of that solid and dignified Classic structure on which the late Mr. Young's reputation was mainly founded. Mr. Gibson's "Walsall Town Hall" (1,639) was illustrated in our issue of October 13, 1900, to which we may refer the reader. A small and not very conspicuous elevation and plan of a "New Bank at Leicester" (1,650), by Messrs. Everard & Pick, shows a good and bold Classic design, with pavilions crowned with gracefully designed cupolas at each side of the façade, the lower part of these pavilions or towers treated in almost plain rusticated masonry. Between them, on the upper stage of the design, is an order in coupled columns. The large banking-room fills the whole central area of the plan, with (apparently) a domed ceiling, which however is not treated as a dome externally. There is a boldness and simplicity of conception about this design which is very pleasing; it is of more architectural importance than some much more showy drawings.

Mr. Keen's "Baptist Church House, Southampton-row" (1,658), has a generally picturesque effect, but is somewhat confused in treatment, it wants simplifying and pulling together; the treatment of the angle is the best feature in it; the employment of a strongly-marked rustification in the upper portion of the design, against plain surfaces in the lower portion, seems rather an inversion of the proper order of things.

Mr. J. Oldrid Scott's design for the new front to Spring-gardens for Messrs. Cocks & Bidulph's bank (1,686) is rather weak in the treatment of the ground story; the projecting wings at each end, crowned with broken pediments have a good and rather bold effect, and the whole looks like a bank. That is just what Messrs. Lockwood & Son's "New Bank Buildings, Chester" (1,690) does not look like; it looks very like a bit of ancient Chester Rows architecture, which we presume is the intention; but this kind of picturesque timber building can never be accepted as properly representative of a bank, which should always have a fortress-like look of solidity about it at all events in the bank story. Among other things that may be mentioned in the class of designs we are now considering are Mr. Atkin Berry's "Offices, Moorgate-street" (1,633), a pretty bit of Gothic street architecture shown in a pretty water-colour drawing; Mr. R. G. Kirkby's "Design for Municipal Buildings, South Shields" (1,665), a nicely-grouped Classic

design (no plan); Messrs. Wimperis & Arber's "Empress Club, Dover-street" (1,677), which fulfils the ordinary ideal of club architecture, but certainly does not rise any higher than that; and Mr. Percy Adams's small pen-drawing of "Dorking Infirmary" (1,679; no plan), which is of interest as showing a certain picturesqueness of effect obtained from grouping of features, in an absolutely plain structure.

In domestic architecture there is nothing of the highest scale or importance, unless we are to regard Mr. Gordon's "Huntercombe Manor, Oxfordshire" (1,678: no plan), as a genuine commission; we must confess it looks rather to us like an imaginary house. If it is really a house to be carried out, the architect must have got hold of a millionaire client whose wealth is superior to his taste, for a more bumptious-looking mansion, and more at variance with what a gentleman's house ought to be, it would be difficult to imagine. The drawing is a fine and effective one.

Mr. Leonard Stokes's "New House, Ascot Heath" (1,528), shows both a plan and a compass (a rare attention in Academy drawings!), and a suitable aspect for the two principal sitting-rooms; but the cook will hardly thank him (in summer) for facing the kitchen south. The design is simplicity itself; materials apparently brick with cement or rough-cast panels, and one hipped roof over all. Mr. Champneys's "House at Heathfield" (1,558) is a pretty sketch; apparently a chapel forms part of the scheme, but there is no plan to explain. Mr. Ernest Newton's "Entrance Front of House at Chislehurst" (1,573) has a plan but no compass; the dining-room and drawing-room face the same way, the dining-room with an obtusely-pointed bay in two cantos, the drawing-room with a bay in four cantos, also coming to a point on the centre line of the room—thus in both instances there is a mullion in the middle of the window instead of a light. To plan windows this way may be amusing as a variation in architectural character, but it is certainly not an advantage in any other respect. Architecturally this is a plain brick house with no ornament but a chequer-work of brick and stone in the upper part of the porch turret, and three lozenges over the door, perhaps for crests. Mr. Newton's other two contributions are "Entrance Front, Steep Hill, Jersey" (1,577), and "Garden Front, Glebelands, Wokingham" (1,578). The former shows an interesting plan but no compass; the drawing-room and library face to the right of the plan, with a verandah between their projecting bays; the dining-room faces to the bottom of it. The exterior is apparently rough-cast; there is a picturesque treatment of one of the chimney-stacks to be noted. No. 1,578 shows no plan, and is a water-colour view of an E-shaped house of the old English domestic type, pleasant and homely.

Mr. Brierley's "Welburn Hall, Yorkshire" (1,576: no plan) was published in our issue of May 18, and we need not say more about it here. "Grimston Court" (1,586), by the same architect, shows a plan of the "irregular picturesque" type, which also characterises the architecture, but there is nothing in the plan to justify or explain the large battlemented mass which rises at the back of the perspective view and forms the most important element in the general effect. The aspects of the principal rooms are properly arranged. Whether it is good to have the servants' hall between the kitchen and the dining-room may be a question.

In Nos. 1,591, 1,596, and 1,597, Mr. C. J. Harold Cooper gives an interesting series of small illustrations of "A House near Piccadilly." The plans are shown to a good large scale, and are interesting as showing the manner in which a good deal of effect is got out of a confined site; the interiors of various rooms are shown in etchings by Mr. Slocombe, and look very well. This is an interesting and unusual exhibit, and might well have been hung lower. Mr. Stratton's "House on the Thames—River Front" (1,598) looks very like a river-side house. Mr. Belcher shows a large but sketchily-executed interior water-colour view of the "Salon, Château Mauricain, Wimereux" (1,599), which shows the usual features of a dignified Classic interior, with nothing special for remark, except that it appears, from the colouring, that the lower surfaces of the modillions in the cornice are gilt. Mr. T. H. Watson, in "Whitney Court Herefordshire" (1,601), shows both a view and a compass, from which we learn that drawing-room, dining-room, morning-room, and library,



THE BUILDER, JUNE 1, 1901

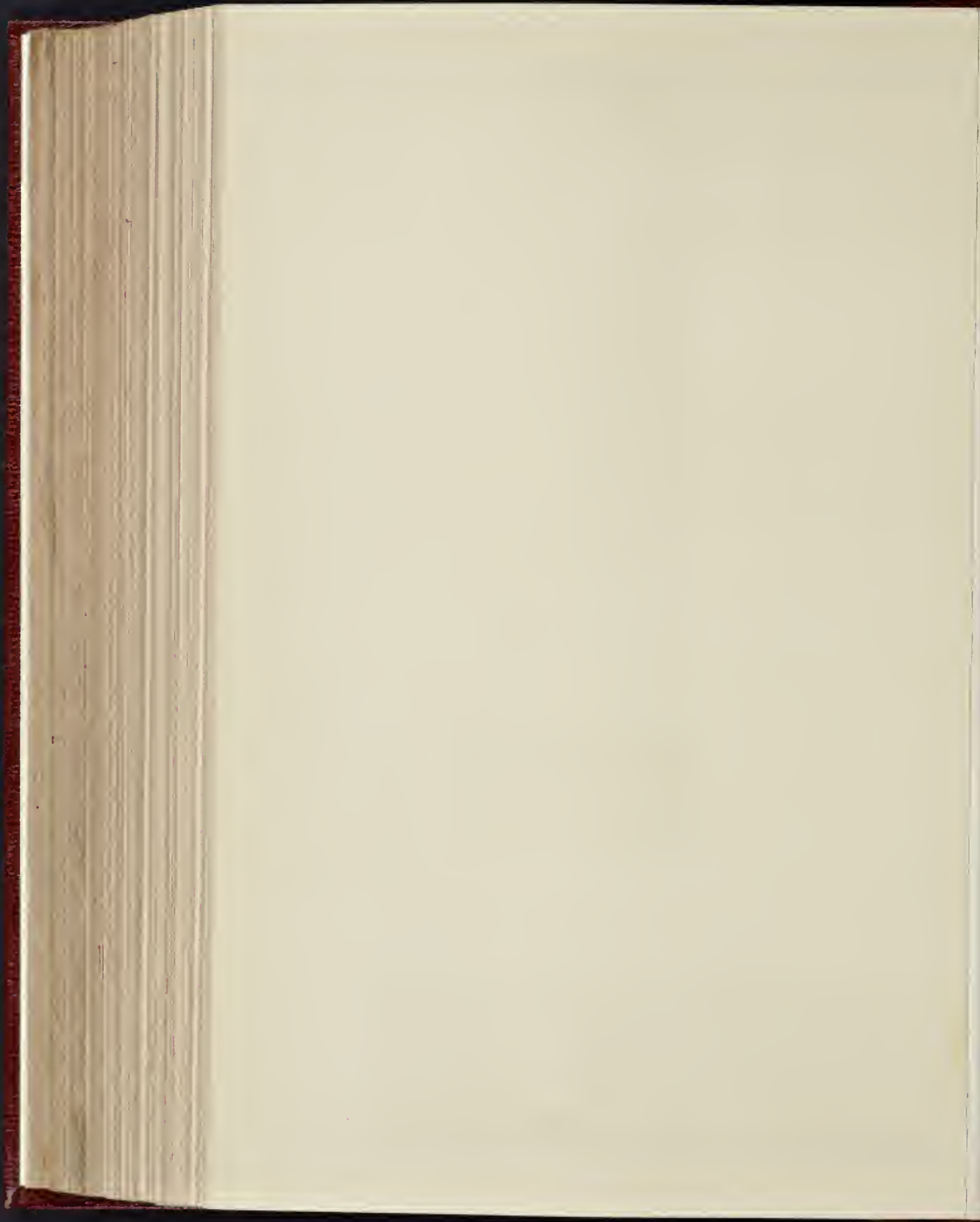




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DRAWING ROOM TO MANSION : SUFFOLK.—MR. A. N. PRENTICE, A.R.I.B.A., ARCHITECT.

A. N. Prentice, 1900.



are all lighted the same way, which cannot be right, unless considerations of prospect have entirely over-riden those of aspect. The connexion of kitchen and dining-room, though they are rather far apart, is well arranged.

Messrs. Mallovs & Crocock's "Terrace and Summer Houses, Dalham Hall" (1,625) is a good piece of garden architecture, showing a semicircular bay on columns projecting from the terrace wall, with a quadrant staircase leading up to it on each side, and a treillage arch behind. The balustrade of the terrace is treated as a small rusticated arcade in place of the usual balusters—a variety at all events. Mr. Arnold Mitchell's "House, Bowden Green" (1,631) is overdone with windows, and seems almost to stand on glass like a shop-front. The same architect's "Additions to Tissington Hall" (1,630) appeared in the *Builder* of May 18, so we need not further describe it. Messrs. Bedford & Kilson send a businesslike frame of plans and elevations of "St. Aidan's Vicarage, Leeds" (1,636), a plain red brick house without any special character—what one may call a sensible house, but the windows might have been treated so as to indicate the staircase. The difference of levels of ground is cleverly made use of in the planning. Messrs. Bateman & Bateman's "House at Barnet Green" (1,640) has some similarity to the one illustrated in the present issue; there is a nice point in the planning of the dining-room, hall, and drawing-room; the hall, with semi-octagon ends, is between the two, the three apartments being *en echelon*; the door-way opening into the lower end of dining-room being opposite to that opening into the upper end of drawing-room. The character of the house is very similar to that of the one we illustrate.

Mr. Bodley's "Hayes Lodge, Morley" (1,647), was illustrated in our issue of May 4. A plan and compass are given, but we must confess that their joint consideration does not lead to very satisfactory conclusions. Drawing-room, dining-room, smoking-room, hall, and boudoir, all face directly south, so that in hot summer weather there is not a sitting-room out of the sun; and the kitchen is at the furthest part of the house from the dining-room, and a circuitous route. If architects who are Academicians plan houses in this way, what is to be expected of outsiders?

Among other drawings which may be mentioned in the group of domestic architecture are Messrs. Cox & Silk's "Residence at St. Albans" (1,642), a pretty residence of which, oddly enough, only the bedroom plan is shown, which is of little use; Mr. Strong's "Design for Forby Golf Club House" (1,645), a low building with three wide segmental bays—very much what a golf club-house should be in architectural appearance—there is no plan; Mr. Ernest Emerson's "New Stables at Oakover" (1,667), which looks a picturesque building of its kind, but is hung too high to see the plan well; and Mr. Figgis's "House at Merstham" (1,675) and Mr. Atkin Berry's "House at Waringham" (1,674 and 1,682), all of them pretty little water-colour views of houses, very fitted for an album of "Rural Architecture," but not of any practical value to architects.

As far as illustrations of domestic architecture go in this year's Academy, they seem to indicate that the taste for the picturesque and irregular in house architecture is predominant, and that there is not much attempt at present at designing houses in a symmetrical manner and on the basis of a predominant idea in plan and architectural treatment.

COMPETITIONS.

MISSION CHURCH, MELTON CONSTABLE.—The plans most approved by the Committee on the recommendation of the assessor are those of Mr. George Fox, A.R.I.B.A., of 1, Southampton-row, Bloomsbury, to whom the work has been entrusted. *Proxime accessit*, Messrs. Godderidge, Witts, & Cleland, of Tamworth.

THE TRIBUNAL OF APPEAL UNDER THE LONDON BUILDING ACT.—The Council of the Royal Institute of British Architects have appointed Mr. Edw. A. Gruning to fill the seat on the Tribunal of Appeal left vacant by the death of Mr. Arthur Cates.

TUNBRIDGE WELLS OPERA HOUSE.—Building operations have been commenced for the Tunbridge Wells Opera House. The architect is Mr. J. P. Briggs, of London, and the contractor for the buildings is Mr. J. Jarvis.

REMOVAL OF SNOW IN LONDON.

THE recently issued annual Report of the Chairman of the Highways, Sewers, and Public Works Committee of the Borough of St. Pancras (Mr. Donald McGregor), contains some remarks as to the clearing away of snow in London, and the totally unreasonable demands made by the public on the vestry officials in respect of this, which merit a wider circulation. Mr. McGregor says:—

"A heavy fall of snow again demonstrated the enormous difficulty (and expense) attendant on its clearance. So much has been said on the subject that it is almost nauseating to answer the unreasonable demands that are always made, and criticism dealt out by persons who have no practical knowledge on the subject. Even if cost were no object, the difficulties would not be reduced thereby, as the number of men and carts available for the work is limited, and notwithstanding a large advance in the wages, there are never enough suitable workmen willing to place their services at the disposal of the Council's officers, and that feature of the case is rendered more difficult by the circumstance that the Legislature has relieved the occupiers of premises of the obligation to cleanse the footways in front. Formerly there used to be almost instantly at the disposal of the public a large army of itinerant workers sufficient for the purpose, but not of the quality that a public body could engage, or pay, and discharge in a summary way. In dealing with public work, many people seem to forget that every hand must be booked, timed, and paid in such a manner as will bear the scrutiny of auditors, and that branch alone absorbs the attention of a large portion of the staff of the department, to the prejudice of other duties they have ordinarily to perform.

It would be as reasonable to expect that a staff of supervisors could be instantly organised, as that an army kept on a peace footing could as quickly be expanded in less than a day to meet an outbreak of war, and, of course, it should be manifest that the Local Body has no power to retain 'reserves' to be called out for compulsory service on the visitation of a snow-fall.

It is true, as people say, that a heavy snow-fall throws thousands out of employment; but it is equally true that very few of those thousands ever offer themselves as scavengers, and the bulk of those who do and are taken on are not of the best class of labour, or who are amenable to the commonest discipline needful for the execution of the required work. Before quitting the subject, I cite one more illustration of the absurdities of the critics. One indignantly asked 'Why the sweeping-machines were not kept at work in double shifts night and day?' That inquirer was not aware of the fact that there is a limit to the number of horses, but yet more so the number of carmen obtainable, for though there may be some few—very few—carmen out of work, the masters know full well how difficult it is to get a supply of good carmen for ordinary work who can be trusted with their animals and other property. In such a case the suggestion to double the number of carmen shows how utterly ignorant the critics are of the inexorable logic of facts."

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association visited Dunfermline recently, where they were enabled to inspect the old House of Pitreuchief, with its various old articles of furniture, pictures, &c. Mr. John Houston, architect, Dunfermline, acted as leader, and read descriptive accounts of the house and the picturesque glen in which it stands. The party then drove to Pitfirrane, where they were received by Sir Arthur Halkett, Bart., who gave an interesting account of the house, and recalled how it had been inhabited by the Halketts of Pitfirrane since 1437.

STREET IMPROVEMENT, SOUTHFOOT.—On the 17th ult., at the Town Hall, Southport, Mr. W. A. Ducat, an inspector to the Local Government Board, held an inquiry into an application by the Southport Town Council for sanction to borrow 15,500l. for the laying of wood blocks in Lord-street, and the widening of certain portions of the street. The Borough Surveyor, Mr. R. F. Hirst, stated that the extent of street to be paved was 1,400 yds. long and 45 ft. wide.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council held on May 20, being the day before the Council adjourned for the Whitsuntide recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the order of reference. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Finsbury, East.—Rebuilding of the Star public-house, City-road, and Nos. 226 to 232, and 236 to 246, Old-street, St. Luke (even numbers only, inclusive) (Messrs. Clutton for Ecclesiastical Commissioners).—Consent.

Marylebone, West.—An iron and glass covered-way in front of No. 33, Hamilton-terrace, St. John's Wood (Mr. J. H. May for Mrs. E. Wilkinson).—Consent.

Brixton.—Six houses on the west side of Cowley-road, Brixton, between Nos. 50 and 76 (Mr. J. Fasnaecht for Mr. W. Goodwin).—Consent.

Hackney, South.—Buildings, with shops on the ground floor, on the site of Nos. 112 to 120 (even numbers only, inclusive), Lower Clapton-road, Hackney, at the corner of Laura-place (Mr. H. Riches for Messrs. W. H. Tilley & Co.).—Consent.

Hammersmith.—Two blocks of dwelling-houses on the west side of Wood-lane, Edgware-road, Shepherd's Bush, northward of No. 3, Wood-lane (Mr. T. Athey for Mr. H. Oliver).—Consent.

Hampstead.—An additional story on part of the entrance lodge to a house known as Belsize-court, Belsize-lane, Hampstead (Mr. A. F. Faulkner for Mr. J. S. Berghelm).—Consent.

Holborn.—Two oriel windows at the first, second, and third floor levels, in front of Nos. 108 and 110, High Holborn (Mr. W. C. Waymouth for Messrs. Cardinal & Harford).—Consent.

Kensington, North.—An iron and glass fernery on the balcony at the first-floor level in front of No. 19, Stanley-gardens, Notting Hill (Messrs. Hukins & Mayell for Mrs. Eddy).—Consent.

Lewisham.—Open porches at the entrances to Nos. 24 and 28, Leyland-road, Lee (Mr. E. Petters for Mr. R. B. A. Chambers).—Consent.

Norwood.—Five blocks of residential flats and a house, with a shop on the ground floor, on the east side of Knight's Hill-road, West Norwood, at the corner of Rothschild-street (Mr. H. Bushell for Mr. P. Stock).—Consent.

Poplar.—A projecting lamp at the Duke of Clarence public-house, No. 133, Grundy-street, Poplar, to overhang the public way of Greenfield-street (Mr. J. R. Johnston for Messrs. Taylor, Walker, & Co.).—Consent.

St. Pancras, West.—A porch, with a three-story enclosure to a staircase over, in front of a block of artisans' dwellings proposed to be erected on the north side of Cardington-street, Hampstead-road, St. Pancras (Mr. A. Whitlaw for the London and North-Western Railway Company).—Consent.

Strand.—Balconies, at the second and third floor levels, in front of a proposed building on the site of No. 46, Great Marlborough-street, St. James's (Messrs. W. Dunn and R. Watson for Mr. C. H. Smith).—Consent.

Wandsworth.—That the application of Mr. Perks, on behalf of Mr. R. Simpson, for an extension of the period within which the erection of houses, with one-story shops, on the site of The Hawthorns and grounds, on the west side of Balham High-road, Wandsworth, at the corner of Marius-road, was required to be completed, be granted.—Agreed.

Lewisham.—Four houses, with one-story shops in front, on part of the site of The Priory, High-street, Lewisham (Messrs. Norfolk & Prior for Mr. C. C. Story).—Refused.

Poplar.—A projecting lamp, to overhang the public way, in front of the Steam Packet beer-house, No. 1, Orchard-place, Blackwall, Poplar (Mr. I. R. Johnston for Messrs. Taylor, Walker, & Co.).—Refused.

Strand.—A projecting sign, to overhang the public way, in front of No. 19, Rupert-street, Shaftesbury-avenue, St. James's (Messrs. Nash & Hull for Mr. A. Pauley).—Refused.

Hampstead.—An iron and glass porch at the entrance to a house known as Kidderpore, Finchley-road, West Hampstead (Messrs. W. E. and F. Brown for Mr. G. A. Dunn).—Refused.

Clapham.—A wood and glass conservatory at the entrance to No. 8, Nightingale-gardens, West-side, Clapham Common, to abut upon Kyrle-road (Messrs. H. Wakeford & Sons for Mr. H. Leach).—Refused.

Lewisham.—Three houses, with shops on the ground floor, on the forecourt of No. 4, Belmont Hill, High-road, Lee (Messrs. Daniel Smith, Son, & Oakley for the Earl of St. Germans).—Refused.

Wandsworth.—A two-story addition in front of No. 35, Jews-row, Wandsworth (Mr. A. E. Nightingale for Mr. H. F. Bartle).—Refused.

St. George, Hanover-square.—An iron and glass shelter at the entrance to No. 15, Wilton-road, St. George, Hanover-square (Mr. W. A. Large for Mr. C. Gerli).—Refused.

Width of Way.

Wandsworth.—A boundary fence on the west side of a roadway skirting Putney Heath and leading northward out of Portsmouth-road, Putney (Mr. P. E. Pilditch).—Consent.

Chelsea.—A laboratory-house, greenhouse, and potting shed at the Physic Garden, Queen's-road West, Chelsea (Mr. E. G. Rivers for the Trustees of the Apothecaries' Company's Physic Garden).—Consent.

Southwark, West.—School buildings on the west side of Mansfield-street, Southwark, at the corner of Earl-street (Mr. A. J. Pilkington for the Managers of St. George the Martyr Schools).—Consent.

Whitechapel.—Two houses on the east side of Tenter-street East, Whitechapel (Messrs. N. & R. Davis).—Consent.

Hackney, North.—A factory building on the west side of Tyssen-street, Dalston-lane, Hackney, with a portion of the boundary fence at less than the prescribed distance from the respective centres of Tyssen-street and Tyssen-passage (Mr. E. O. Sachs for The Shannon, Limited).—Refused.

Rotherhithe.—A warehouse on the north side of Tanner-street, Bermondsey, at the corner of Finnimore-court and to extend over Rowland's-court (Mr. G. A. Hall for Mr. G. H. Hughes).—Refused.

Space at Rear.

Hammersmith.—A block of dwelling-houses on the west side of Wood-lane, Uxbridge-road, Shepherd's Bush, northward of No. 3, Wood-lane, with an irregular open space at the rear (Mr. T. Athey for Mr. H. Oliver).—Consent.

Lewisham.—A two-story dwelling-house on the east side of Farley-road, Lewisham, at the corner of Davenport-road, with an irregular open space at the rear (Mr. C. Farley).—Consent.

St. George, Hanover-square.—A deviation from the plans approved on July 31, 1899, under Section 41 (1) (a) of the Act, for the erection of a block of residential flats on the site of No. 25, Hanover-square, at the corner of George-street, St. George, Hanover-square, with an irregular open space at the rear, so far as relates to the erection of a small addition at the first-floor level at the rear of the premises (Messrs. C. Bell, Withers, & Meredith for Mr. G. H. Schofield).—Consent.

Whitechapel.—Three dwelling-houses, with shops on the ground floor, on the north side of Commercial-road, Whitechapel, at the corner of Church-lane, with irregular open spaces at the rear (Mr. H. O. Ellis for Mr. S. Kirstein).—Consent.

Waltham.—The reduction of the area of the open space at the rear of No. 92, New Kent-road, Waltham (Mr. A. S. Taylor for the Committee of the Murphy Memorial Hall).—Consent.

Holborn.—A block of residential flats on the site of Nos. 47, 48, and 49, Hunter-street, and No. 9, Handel-street, Brunswick-square, St. Pancras, with an irregular open space at the rear (Mr. J. Davis for Messrs. Brown Brothers).—Refused.

Kensington, South.—A block of residential flats, with business premises on the basement, ground and first floors, on the south-east side of Brompton-road, Kensington, at the corner of New-street, with an irregular open space at the rear (Mr. C. W. Stephens for Harrod's Stores, Limited).—Refused.

Width of Way and Line of Frontage.

Hackney, Central.—Additions on the east and west sides respectively of a church on the north side of Pembury-grove, Lower Clapton, with the forecourt fence at less than the prescribed distance from the centre of the street (Mr. J. W. Dunford for the Trustees of the United Methodist Free Church).—Consent.

Lines of Frontage and Space at Rear.

Hackney, North.—An addition at the rear of No. 90, Stamford-hill, Hackney, to abut upon Grove-lane (Mr. E. Bates for Messrs. Welford & Co).—Consent.

Battersea.—Seven houses on the west side of Winders-road, Battersea, between Battersea Dispensary and Simpson-street (Messrs. N. S. Joseph, Son, & Smith for Mrs. Simpson).—Consent.

Width of Way and Space at Rear.

Rotherhithe.—A medical officer's house at Southwharf, Rotherhithe, and the erection of two cottages on the east side of a private way out of the south side of Rotherhithe-street (Messrs. T. W. Aldwinckle & Son for the Metropolitan Asylums Board).—Consent.

Alteration of Building.

Hampstead.—A greenhouse on the east side of No. 2, Hampstead Hill-gardens, Rosslyn Hill, Hampstead, with a portion of such greenhouse within a ft. of the party-wall between such greenhouse and the garden at the rear of No. 12, Rosslyn Hill, without such party-wall being carried up as required by Section 59 (2) of the Act (Mr. F. J. Potter for Mr. R. G. Orr).—Consent.

Formation of Streets.

Leamsham.—That an order be issued to Messrs. Daniel Smith, Son, & Oakley, sanctioning the forma-

tion or laying out of a new street for carriage traffic out of the east side of Elliot Park, Blackheath, and in connexion therewith the widening of a portion of Elliot Park (Messrs. Kennard Brothers). That the name Oakcroft-road be approved for the new street.—Agreed.

Poplar.—A deviation from the plan sanctioned by the late Metropolitan Board of Works on June 3, 1881, for the formation of streets in continuation of Portree-street and Lee-place (now known as Lanrick-road), Poplar, so far as relates to the direction and extent of those streets (Mr. C. Dunch for Mr. J. Abbott).—Agreed.

Rotherhithe.—That the Council do make no order with respect to the application of Messrs. T. W. Aldwinckle & Son on behalf of the Metropolitan Asylums Board, for sanction to the formation of laying out of a street for carriage traffic to lead out of the south side of Rotherhithe-street, Rotherhithe, on a portion of South Wharf.—Agreed.

Poplar.—That an order be issued to Mr. H. Hooper, refusing to sanction the formation or laying out of a street for carriage traffic in continuation of Cahir-street, East Ferry-road, Millwall (for Lady Margaret Charteris).—Agreed.

Woolwich.—That an order be issued to Messrs. Farebrother, Ellis, & Co., refusing to sanction the formation or laying out of new streets for carriage traffic on the Bowater estate, Trinity-street, Woolwich-road, Woolwich (for the trustees of the Bowater estate).—Agreed.

Southwark, West.—That an order be issued to Messrs. Hubbard & Moore refusing to sanction the formation or laying out, for foot traffic only, of a street to lead out of the west side of Southwark Bridge-road, near Sumner-street (for Mr. H. Ward).—Agreed.

Buildings for the Supply of Electricity.

Woolwich.—An electricity generating station and works on the east side of White Hart-road, Plumstead-marshes (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.

Means of Escape from top of High Buildings.

St. George, Hanover-square.—Means of escape in case of fire on the eighth story of a proposed block of residential flats to be known as No. 10, Park-lane, St. George, Hanover-square (Messrs. Rolfe & Matthews for Sandow's, Limited).—Consent.

Lines of Frontage and Construction.

Islington, West.—Retention of two wooden sign boards on the south-west side of Holloway-road, Islington, one on the site of the proposed Marlborough Theatre, and the other at the corner of Parkhurst-road (Mr. F. Matcham for Mr. F. W. Purcell).—Consent.

Strand.—Retention of a temporary stone landing with a wooden goods shoot under, at No. 71, Jermy-street, St. James's, to abut upon Bury-street (Mr. G. F. Harrington for Messrs. Standen & Co.).—Consent.

Width of Way and Construction.

Poplar.—An iron workshop on the west side of North-street, Poplar (Messrs. T. Evans & Son).—Refused.

Width of Way and Working-class Dwellings.

Lambeth, North.—That the Council's resolution of February 19, with respect to the erection of three blocks of dwelling-houses to be inhabited by persons of the working-classes on a site between Gloucester-street and Burdett-street, Lambeth, be modified, so that the time within which such dwelling-houses were required to be completed be extended to two years.—Agreed.

Conversion of Building.

Hampstead.—The conversion into dwelling-rooms of the first floor over the stables on the west and south sides of a yard out of the west side of Beisze-lane, Hampstead (Mr. F. Wilby for Mr. W. Burdett).—Refused.

Deviations from Certified Plan.

Holborn.—Deviations from the plans certified by the District Surveyor under Section 43 of the Act, so far as relates to the proposed erection of two houses (with shops on the ground floor) and a warehouse building on the site of Nos. 66 and 68, Theobald's-road, and No. 1, Emerald-street, Holborn (Mr. R. L. Cox for Mr. M. Boyce).—Refused.

Naming of Streets.

Battersea.—That the new streets on the site of the Latchmere allotments, Sheepcote-lane, Battersea, be named Burns-road, Council-street, Joubert-street, and Odger-street.—Agreed.

TRINITY HOSPITAL, LEICESTER.—The Mayor of Leicester performed the ceremony of laying the memorial-stone of the new Trinity Hospital, in the Newark, Leicester, on the 20th ult. The new building will accommodate twenty men and seventeen women, with apartments for the matron and other attendants, and the cost is estimated at about 12,000l. The architects are Messrs. R. & J. Goodacre, the builders Messrs. W. Moss & Sons, Limited, Loughborough, and the clerk of the works Mr. J. Esford.

ENGINEERING SOCIETIES.

INSTITUTION OF ELECTRICAL ENGINEERS (DUBLIN LOCAL SECTION).—The first Report of the Dublin Section of the Institution of Electrical Engineers has been issued. The Report commences with commenting on the great loss the Section has sustained by the death of its first Chairman, Professor Fitzgerald. For the Session 1901-1902 Professor W. F. Barrett, F.R.S., has been elected Chairman, Mr. J. W. Towle Vice-Chairman, and the Committee consists of Messrs. C. A. Burge, C. P. C. Cummins, F. Gill, Monsignor G. Molloy, D.D., D.Sc., Messrs. A. E. Porte, W. Tallow, P. S. Sheardown, F. T. Trouton, D.Sc., F.R.S., G. F. Pilditch, and M. C. Olsson.

CHRIST'S HOSPITAL AND ITS SITE.

THE Earl of Jersey's Committee of the House of Lords have found as proved the preamble of the Bill promoted by the Governors of St. Bartholomew's Hospital for their compulsory acquisition of a portion of the site of Christ's Hospital upon arbitration. For 1½ acres the Governors are willing to undertake to pay 17,000l.; Christ's Hospital require 201,000l., but desire rather to sell the entire site for 750,000l. On behalf of the Council of Almoners of Christ's Hospital, Mr. Fitzgerald, K.C., urged that they could not accept arbitration, inasmuch as they owned a site of 5½ acres in the heart of the City of London for which specific offers of 720,000l. and 700,000l. had been made to them. St. Bartholomew's Hospital set forth their need of more room for the adequate treatment of out-patients and casualty patients, for the nursing staff, operating theatres, and mortuary, also for a new pathological department, for isolated blocks for infectious diseases, and for their resident medical staff. At their meeting last week the Court of Common Council carried a report prepared by their City Lands Committee upon the two Bills now before Parliament, recommending that in view of the magnitude of the public interests involved, no opposition should be offered to the acquisition by St. Bartholomew's Hospital of the land shortly to be vacated by Christ's Hospital. In the course of the discussion Alderman Sir George Faudel-Phillips is reported to have stated that in the case of one of the two offers we cite above the tendering parties are now bringing an action against the Almoners for non-fulfilment of their contract, and that under the Charity Commissioners' scheme for removal of the boys' boarding school to Horsham the charity had suffered a loss of between 7,000l. and 8,000l. a year. On the other hand, it is announced that the petition of the London County Council praying to be heard against the Bill for authorising the sale and disposal of the site will represent that there is a great and increasing need for the preservation of open spaces in the neighbourhood; that there is no precedent for abrogating the provisions of the Disused Burial Grounds Act for the purposes of enhancing the value of lands to which that Act applies and enabling them to be sold as ordinary building land for ordinary commercial objects; that the existing buildings would suitably serve for the science school and the girls' day school (1,000 pupils) which the Governors are required to provide on a site distant not further than three miles from the Royal Exchange; that the Council should be enabled to acquire certain parts of the site and buildings which possess historical and architectural interest; and that a clause should be inserted in the Bill for precluding the erection of buildings upon the ground except in accordance with the statutory obligations applying to the County of London generally, and to secure the transfer to the Council or any objects of antiquarian, archeological, or geological interest that may be excavated. The Almoners' Bill will be read for the second time at an early date in the House of Commons. A statement issued by the Governors of Christ's Hospital avers that the cost of the migration to Horsham, though cut down in every possible way, amounts to no less than 550,000l., and that the valuable character of the Newport-street site was indeed the main justification for the compulsory removal of the school from London. We may point out that the Charity Commissioners' scheme includes no provision for a disposal of the hospital buildings and their site. The authority of an Act is required before the Governors can give a good title to the land for building purposes. Some parts of the site are leasehold, and some part has been used for interments.

CO-OPERATIVE BUILDINGS, EXETER.—The foundation stone has just been laid of new premises for the Exeter Co-operative Society at St. Sidwells. The buildings will cost about 10,000l., but the section to be now erected will cost only between 2,000l. and 3,000l. The elevation of the blocks will be of red brick, and the central gable will have a clock tower. Mr. F. J. Comlin, Exeter, is the architect, and the contractor is Mr. G. Herbert.

Correspondence.

To the Editor of THE BUILDER.

THE ORIGINS OF ANCIENT ART.

SIR,—In his recent lecture at the R.I.B.A., Professor Petrie asks for an explanation of the early form of Greek column increasing in size from bottom to top.

I do not think there is any difficulty in explaining the peculiarity. An examination of my old timber building will show that the main posts are always placed butt upwards.

Old workmen, who still retained many old building traditions, have assured me that the object of this was to let the sap run out. It is easy, at any rate, to understand the fancy that damp would not rise from the ground the wrong way of the cells; for aught I know, both theories may be correct.

Internally the butt ends were roughly formed into spreading corbels, that gave extra support to the tie-beams, and externally we are all familiar with the manner in which the corbels of the butts of corner posts were carved into angels and other legendary beings.

The same reasons that influenced the Medieval doubtless affected the Greek builder, and the columns, which were originally of wood, were placed butt upwards, and in time the tops of the butt formed into capitals, the lower end remaining naturally without base.

If the trees were conifers, as is probable, the butts would be more regularly shaped than our English oak.

RALPH NEVILL, F.S.A.

WHAT IS A "SHINER"?

SIR,—In reply to Mr. Kampe's question in your list, I believe "shiner" is a West-country term, and there is used to denote a thin stone built face upwards—being, in fact, a small stone, but looking like a large one when in place. J. H.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

20.—TRAPS.

A PLUMBER'S trap is a vessel affording a free passage for water but not for air. In its simplest form it is merely a bent pipe (fig. 1); the bend retains the last portion of the water entering it, and as the water occupies the full bore of the bent portion of the pipe, it affords a barrier against the passage of air.

The waste-pipes from all sanitary fittings, except water-closets and perhaps slop-sinks, ought to be disconnected from the drains by being made to discharge over or into trapped siphons placed in the ground outside the building. These drain-traps, however, are not sufficient to prevent foul air passing into the building. The water in the trap may be so charged with impurities as to give off unpleasant gases, and experiments have shown that if the air on one side of a trap is polluted, a small but appreciable amount of the pollution can after a time be traced on the other side; in other words, the foul gases may be absorbed by the water on one side and given off again on the other. An untrapped waste-pipe, even though disconnected from the drain, may thus convey impure air from the drain into the house. But waste-pipes themselves are often seriously fouled by the passage of dirty liquids through them, and the deposits in the pipes decompose and give off foul gases, which are drawn into the house unless a trap is interposed. The waste-pipes from sinks and urinals are often extremely filthy, and those from baths and lavatories are seldom entirely free from soapy deposits. Every sanitary fitting ought therefore to have a trap, either in itself or in the waste-pipe as near the fitting as possible.

A good trap should be self-cleansing, and should have a sufficient depth of seal and a reasonable resistance to siphonage. Round-pipe traps are most easily kept clean, as the water passes through them with considerable velocity and there are no corners for the retention of filth. On the other hand, they are more easily emptied by siphonage than traps of some other types. Siphonage can, however, be prevented by means of an air-pipe carried from a point near the outlet of the trap, and round-pipe traps, if properly ventilated,

are undoubtedly the best. Several modifications of the round-pipe trap have been introduced for the purpose of reducing the risk of siphonage, and will be noticed hereafter. The seal of a trap (other than a round-pipe trap under a valve closed) is seldom entirely destroyed either by siphonage or momentum, unless two or more fittings are connected to the same waste-pipe, but a considerable portion of the water may be drawn out by siphonage or carried out by the momentum of the discharge; the depth of the water-seal is therefore reduced, and, if the fitting is not used again for a long time, evaporation may lower the level of the water to a point below the dip, and air can then pass through the trap.

The D trap has been so frequently condemned by sanitarians that it is now never used by any one with the slightest knowledge of modern plumbing. It cannot possibly be kept clean and becomes in time a miniature cess-pool. Its only advantage is that it cannot be unsealed by siphonage; but this is far more than counterbalanced by its uncleanness. The numerous seams are also sources of danger, and the dip-pipe may be corroded through and allow the passage of foul air, the defect, perhaps, remaining unnoticed for a long time, as the dip-pipe is concealed within the body of the trap. The "mansion" trap, although an improvement on the D trap, soon becomes foul and is now never used.

The "bell" trap (fig. 2) has been very largely used for sinks. It consists of a cup (generally of lead) with a stand-pipe in the middle, over which is placed the brass grate, to the underside of which a "bell" is attached. The bell dips into the water contained in the cup below, and thus forms the seal of the trap. The trap is not self-cleansing, the depth of seal is often less than $\frac{1}{2}$ in., and the flow through the trap is so sluggish that servants often remove the bell and grate, thus allowing a free passage for the air from the waste-pipe. In some cases the grate is hinged, but this is no improvement from a sanitary point of view.

Anti-l lead trap (fig. 3) is better, but cannot be recommended. The form illustrated is intended for sinks, and is made in sizes from $2\frac{1}{2}$ to 4 in. at the top, but a modification of it (in lead or brass) is still used for high-class lavatories. Such a trap is shown in fig. 4. A trap of the same general design, but with side outlet is illustrated in fig. 5. Deposits are certain to occur, and the cleansing screws at A are therefore absolutely necessary. Cast lead traps for sinks are also made of the same design as fig. 4, but with longer necks to pass well through the sink for the purpose of soldering the lead cone to the inlet of the trap. Lead cones (fig. 6) for $1\frac{1}{2}$ in. traps are made to receive 3 or $3\frac{1}{2}$ in. grates, and those for $1\frac{1}{2}$ in. traps to receive $3\frac{1}{2}$ or 4 in. grates. The large grates, of course, ensure a better flow through the traps, but even with this improvement the traps are not self-cleansing, and foul air may pass into the house through perforations or cracks in the concealed midfeather. Traps of the kind illustrated in figs. 4 and 5 are often known as "oval" traps from the shape of the horizontal section of the bodies.

Round-pipe traps are made in various forms, known by distinctive names. Fig. 7 shows an "S" trap, fig. 8 a "three-quarter S" or "open S," fig. 9 a "P" trap, fig. 10 a "bag" trap, fig. 11 a "Q" trap, and fig. 1 a "running" trap. Drawn lead traps of these shapes are often known as Dubois' traps, and are made in sizes from $1\frac{1}{2}$ in. to $4\frac{1}{2}$ in., each size being made in two weights as follows:—

Diameter of Trap.	Weight of Lead per Super ft.
$1\frac{1}{2}$ in.	$4\frac{1}{2}$ lbs. and 6 lbs.
$1\frac{3}{4}$ "	5 " " 7 "
$1\frac{1}{2}$ "	$5\frac{1}{2}$ " " 7 "
2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4 and $4\frac{1}{2}$ in.	6 " " 8 "

All the sizes from $1\frac{1}{2}$ to 3 in. inclusive, are made either with or without cleansing screws as required. The larger sizes are intended for water-closets and slop-sinks, and are not fitted with cleansing screws. Special drawn-lead traps and bends for water-closets and slop-sinks are also made, as shown in fig. 12, the diameters ranging from $2\frac{1}{2}$ to $4\frac{1}{2}$ in.; each size is made in two weights (6 lbs. and 8 lbs.) and in two lengths (28 in. and 33 in.) to suit different thicknesses of wall. The advantage of these is that they do away with the objectionable joint in the body of the wall.

Cast-lead P and S traps (with or without cleansing screws) are made in two sizes, $1\frac{1}{2}$ in. and 2 in., for sinks and lavatories, and P traps

(without cleansing screw) $1\frac{1}{2}$ in. in diameter in two weights, for water-closets, &c. Special 4-in. cast-lead P or S traps of 10 lbs. lead (fig. 13) are made for water-closets and slop-sinks with bases for fixing to the floor, and with sockets for receiving the basins. Similar cast-lead bases and sockets are also fitted to $3\frac{1}{2}$ in. and 4 in. drawn lead P and S traps.

In order to ensure a more thorough flush of water through the trap, the inlet ought always to be considerably enlarged. In many lavatory basins the waste-plug is only 1 in. or $1\frac{1}{2}$ in. in diameter, and the effective area of the opening is reduced by the solid part of the grating below. To fix a $1\frac{1}{2}$ in. trap under such a fitting is a mistake, as it cannot be properly flushed by the discharge. The area of the openings in the waste-grating ought always to be greater than the sectional area of the trap.

Drawn-lead traps are of equal bore throughout, and some plumbers prefer cast or hand-made seamed traps with square dips and weir outlets, as shown in fig. 14. The depth of the seal is thus considerably increased, and a better scour is obtained in the bottom of the trap. The size illustrated is suitable for water-closets, and has an enlarged inlet, and less easy curves, so as to reduce the risk of siphonage.

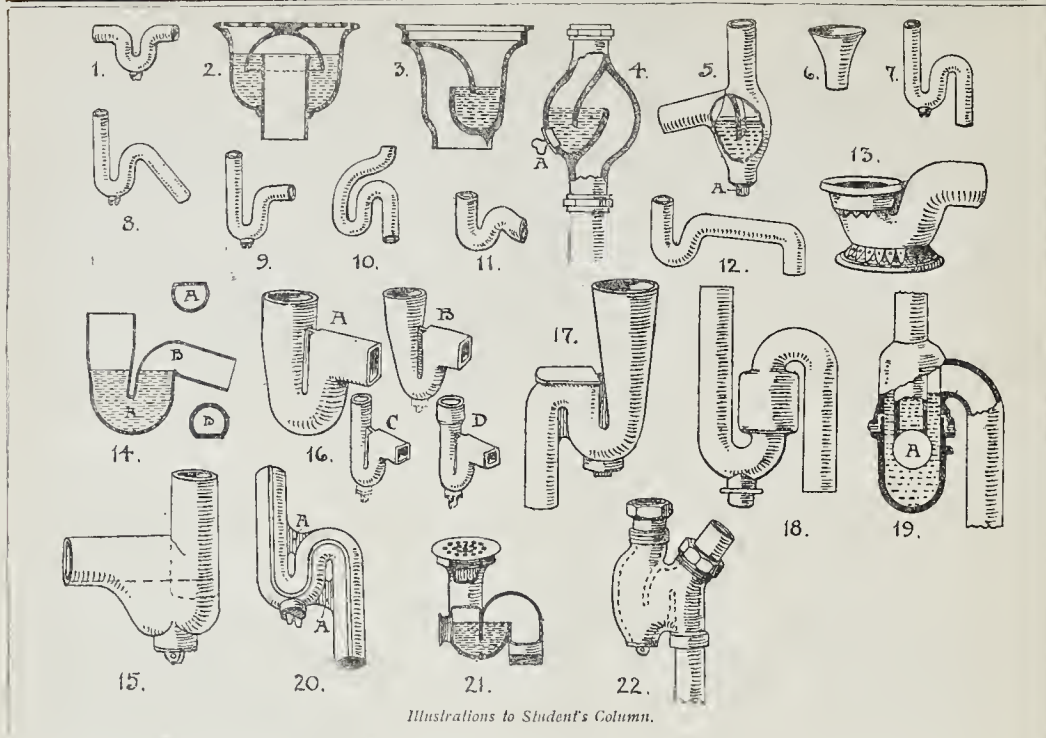
Cast-lead traps of various kinds are now made for the express purpose of preventing siphonage in the case of single fittings. Smeaton's "Eclipse" trap (fig. 15) has served as the model from which later designs have been produced. It has a round dip-pipe, and the body is designed to give a considerable area of standing water on the outlet side of the trap, and a volume of air in the angle above this water. In Hellyer's "Anti-D" trap (fig. 16) the chief peculiarity is the square outlet. It has the same angular air-space above the standing water as the "Eclipse" trap, but differs from the latter in having two thicknesses of lead between this air-space and the inlet-pipe. The size marked A has a $4\frac{1}{2}$ in. inlet and a 3 in. outlet, and is intended chiefly for valve-closets and slop-sinks; B has a $3\frac{1}{2}$ in. inlet and $2\frac{1}{2}$ in. outlet, the depth below the dip being 2 in., and is intended for large sinks and baths; C is a lavatory trap and has a $1\frac{1}{2}$ in. inlet and outlet; D is similar to C, but with the inlet enlarged to $2\frac{1}{2}$ in., and is suitable for lavatories and small sinks and baths. A is of metal equal to 8 lbs. lead, and B, C, and D, 9 lbs.; the three latter are made with cleansing screws, if required. The depth of seal is in every case $1\frac{1}{2}$ in., and even the largest trap holds only $2\frac{1}{2}$ pints of water, or less than one-sixth of the quantity generally allowed for flushing a water-closet.

The "Kensington" cast-lead trap is on somewhat similar lines, having a flat top over the standing water on the outlet side of the trap. It is made in P or S form (fig. 17) in two sizes, $3\frac{1}{2}$ to $1\frac{1}{2}$ in. and 4 in. to 2 in., for sinks, &c., and in P form (4 in. to 4 in.) for water-closets. These traps are self-cleansing and offer considerable resistance to siphonage.

The "Hadley Anti-siphonic" trap (fig. 18) is guaranteed by the makers "to give a permanent seal under all conditions" without vent-pipe. It is a round pipe trap with an enlargement on the outlet leg, and with a great depth of seal. Partial siphonage of the trap may, of course, occur, but it is claimed that the enlarged portion cannot possibly be emptied; the water in this falls back after a discharge and is sufficient to recharge the lower part of the trap. It is made of lead in S and P shapes, and in the following sizes: 1, $1\frac{1}{2}$, $1\frac{3}{4}$, $1\frac{1}{2}$, 2, and $2\frac{1}{2}$ in. for sinks, lavatories, urinals, &c. There is a possibility of deposits accumulating in the enlarged portion.

Mechanical traps are now seldom used, as they are not self-cleansing. The "Bower" trap (fig. 19) is well known, and, although not the best, will serve as an example. The dip-pipe, outlet-pipe, and upper portion of the body are made in one piece of cast lead, and the lower portion of the body of lead or glass. A light india-rubber ball (A) in the body of the trap is supposed to seat itself against the dip-pipe and form an efficient barrier against the entrance of foul air into the house. The ball obstructs the passage of the water through the trap, and deposits are certain to occur. A perforation in the upper part of the dip-pipe might pass unnoticed for a long time, as it is concealed in the body of the trap.

Lead is the metal most generally used for the traps of those sanitary fittings which are not trapped in themselves, but iron, brass, and white metal are also used. Seamed lead traps



Illustrations to Student's Column.

made by hand are now seldom adopted; they are costly, and are soon corroded along the seams, besides being subject to defects due to careless workmanship. The seams are generally soldered, and may be either wiped or formed with the tool known as the "copper bit," the wiped seam being the better of the two. "Burned" seams require special apparatus, and are not often made by the journeyman plumber. In these seams the joint is formed with lead instead of solder, thus avoiding the galvanic action set up between the tin and lead. Cast-lead traps with burned seams are generally produced in factories. The example shown in fig. 20 is known as Cloughton's, and is cast in two pieces, which are afterwards united by burned seams. Webs are cast on at AA to prevent the drooping of the outgo, which is sometimes so serious as to destroy the seal of an ordinary trap. S and P traps of this form are made in three sizes, 1½ in., 1¾ in., and 2 in., and running traps in two sizes, 1½ in. and 2 in. The lead is equal to 7½ lbs. per sup. ft.

Several examples of cast-lead traps have been given. If properly made, they ought to be smooth inside and the metal ought to be of equal thickness throughout and free from pinholes and other defects. Drawn-lead traps are made by forcing lead through annular dies, as in the process of pipe manufacture, but special arrangements are adopted for bending the pipes to the desired curves. Drawn-lead traps are as smooth inside as outside, and are of uniform bore throughout. When the inlets are of proper size the traps are self-cleansing, but the smooth surfaces and easy curves render them peculiarly liable to unsealing by siphonage or momentum; hence the necessity of trap-ventilating pipes.

Cast-iron traps are made in various sizes for sinks, baths, water-closets, and other fittings; several examples have been given in preceding chapters. Tye & Andrew's sink traps are of P and S shape, with a midfeather between the inlet and outlet portions. They are made in three sizes, 3-in. grate, with 1½ in. outlet; 4 in. grate, with 2 in. outlet; and 6 in. grate, with 3 in. outlet. Brass clip grates are provided for stone sinks, and brass screw grates (fig. 21) for lead and slate sinks. The outlet may be screwed, as in the illustration, for connexion to an iron waste-pipe, or plain for connexion to a lead waste-pipe. For baths and lavatories the inlet and outlet are screwed. The cleansing screw is of brass, and may

be placed in the side or bottom of the trap, the latter being the more convenient position. The traps are without ventilating arms, and any imperfections in the midfeather may pass unnoticed for a long time. The traps are galvanised, but the coat of zinc affords very little protection. Other cast-iron traps are coated with Angus Smith's solution, or by the Bower-Barff process, but better protection is afforded by vitreous or porcelain enamel. The castings ought to be smooth, of uniform thickness, and free from pinholes and other defects. A glass-enamelled iron midfeather trap for lavatories is shown in fig. 6, chap. ix.; cast-iron bath-traps in figs. 6, 7, 9, and 10, chap. xi.; and a cast-iron water-closet and trap in fig. 6, chap. xiv.

Cast brass traps are often used for lavatories, and less frequently for baths and sinks. A common form for lavatories is shown in fig. 4. It is neat in appearance, but is not self-cleansing. The brass midfeather trap with vent-union (fig. 22) is on somewhat similar lines, with 1½ in. inlet and outlet. Two forms of bath-trap were illustrated in figs. 4 and 5, chap. xi., the latter having a coupling for an anti-siphonage pipe. The common defect of brass traps is that they are very rough inside, and deposits are almost certain to occur in consequence. On the other hand, they are stronger and less easily corroded than lead. Some makers prefer to leave the traps dull outside, while others finish them by polishing or nickel-plating. White-metal traps follow the same lines as brass traps, but are not often used.

Glazed-ware traps are made for laboratory and kitchen sinks. They are generally 2 in. in diameter, in P or S shape. An example was given in fig. 8, chap. vi. They are self-cleansing and incorrodible. Glazed-ware traps for water-closets and slop-sinks have been illustrated in the chapters on those fittings.

SADLER'S WELLS THEATRE.—Sadler's Wells Theatre has just been renovated, the work having been carried out under the supervision of Mr. Bertie Crewe. The ceilings, of lath and plaster, have been removed, and silicate cotton substituted. Other improvements include the introduction of a fireproof curtain and the addition of two "extra" exits and fireproof staircases. The work has been carried out without interfering with the nightly performances, the scaffolding having been taken down each day. The whole of the drainage has been reconstructed. The contractors were Messrs. John Weibking & Sons, the general foreman having been Mr. Charles Abbey.

Illustrations.

DRAWING-ROOM TO MANSION, SUFFOLK.

THE dimensions of this room are 31 ft. long by 17 ft. wide and 12 ft. 6 in. high, and in addition to this there is a large bay window facing west on the side opposite the fireplace. The walls are panelled in mahogany, the larger panels being filled with a rich green silk material; the mouldings and enrichments of the wood panels are gilded in an old gold tone. The ceiling is treated with bold fruit enrichments in fibrous plaster, executed by Messrs. Jackson & Sons from the architect's design.

The modelled figures and other ornaments to the mantelpiece were carried out by Mr. Taylerson. A. N. PRENTICE.

HOUSE AT BARN T GREEN, WORCESTERSHIRE.

The site of this house is situated on a knoll sloping towards the S.E., S., and S.W., with long distant views in these directions, which governed the disposition of the plan, and the form it should take with the supporting terraces and garden. Rough cast, stone, stone slates, and old bricks for chimneys, were the materials proposed, with some oak work inside.

The architects are Messrs. Bateman & Bateman, of Birmingham.

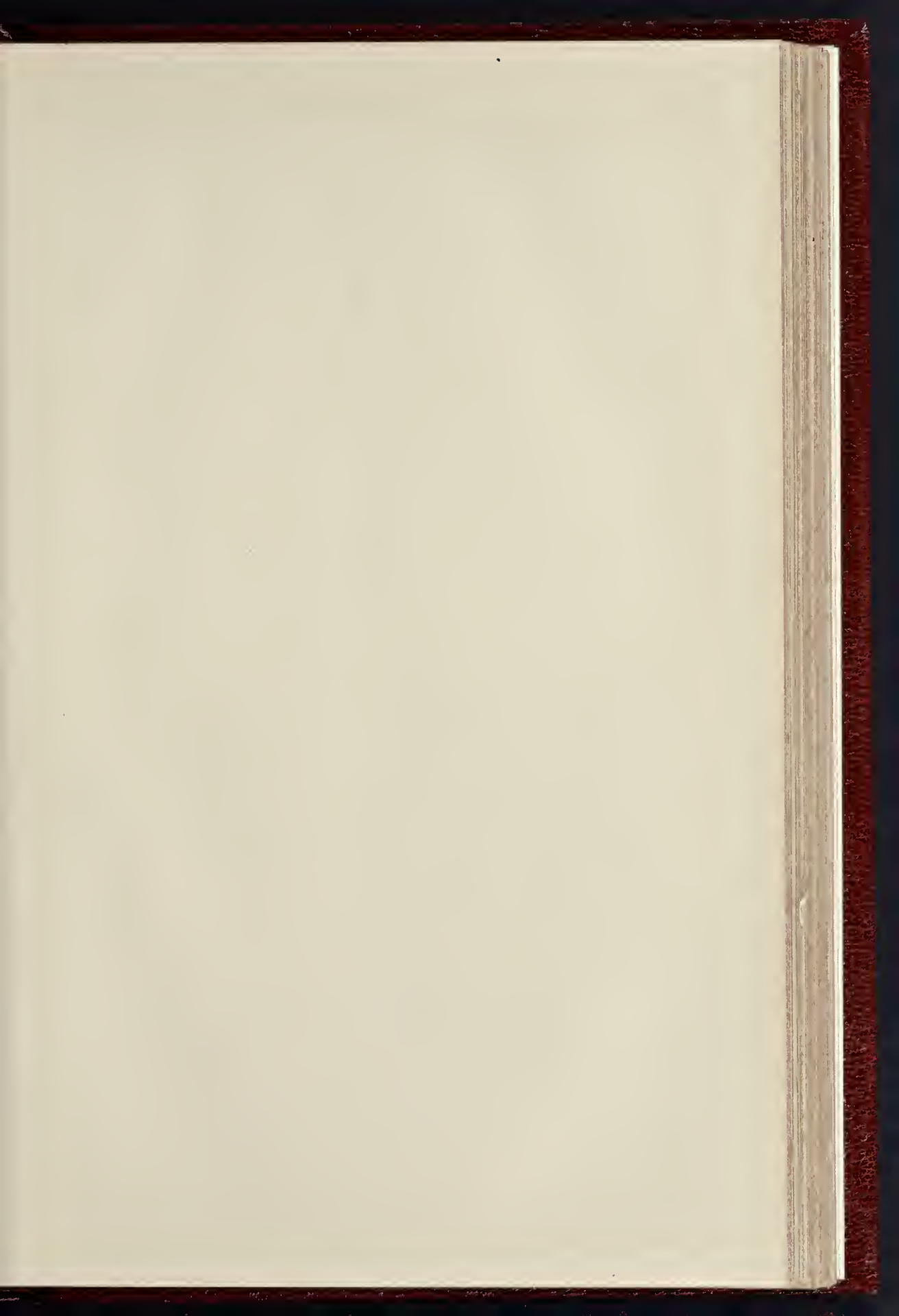
HOUSE, ROSE CROFT AVENUE, HAMPSTEAD.

The site required that this house should be planned on the lines of an obtuse angle.

The elevations were carried out in red sand-faced bricks, with lifting sashes, the frames in external reveals with wood dressings, cornices to bay windows, &c. The roof was covered with red tiles and finished by a flat railed around to form a belvedere on account of a very fine view across the country.

This belvedere was reached by carrying up the back staircase. The plan indicates the position of the reception-rooms and offices. On the floors above are eleven bedrooms.

The house was built by Messrs. Boddy & Chapman from the designs of Mr. C. H. B. Quennell.





H. Dare Bryan Archt.

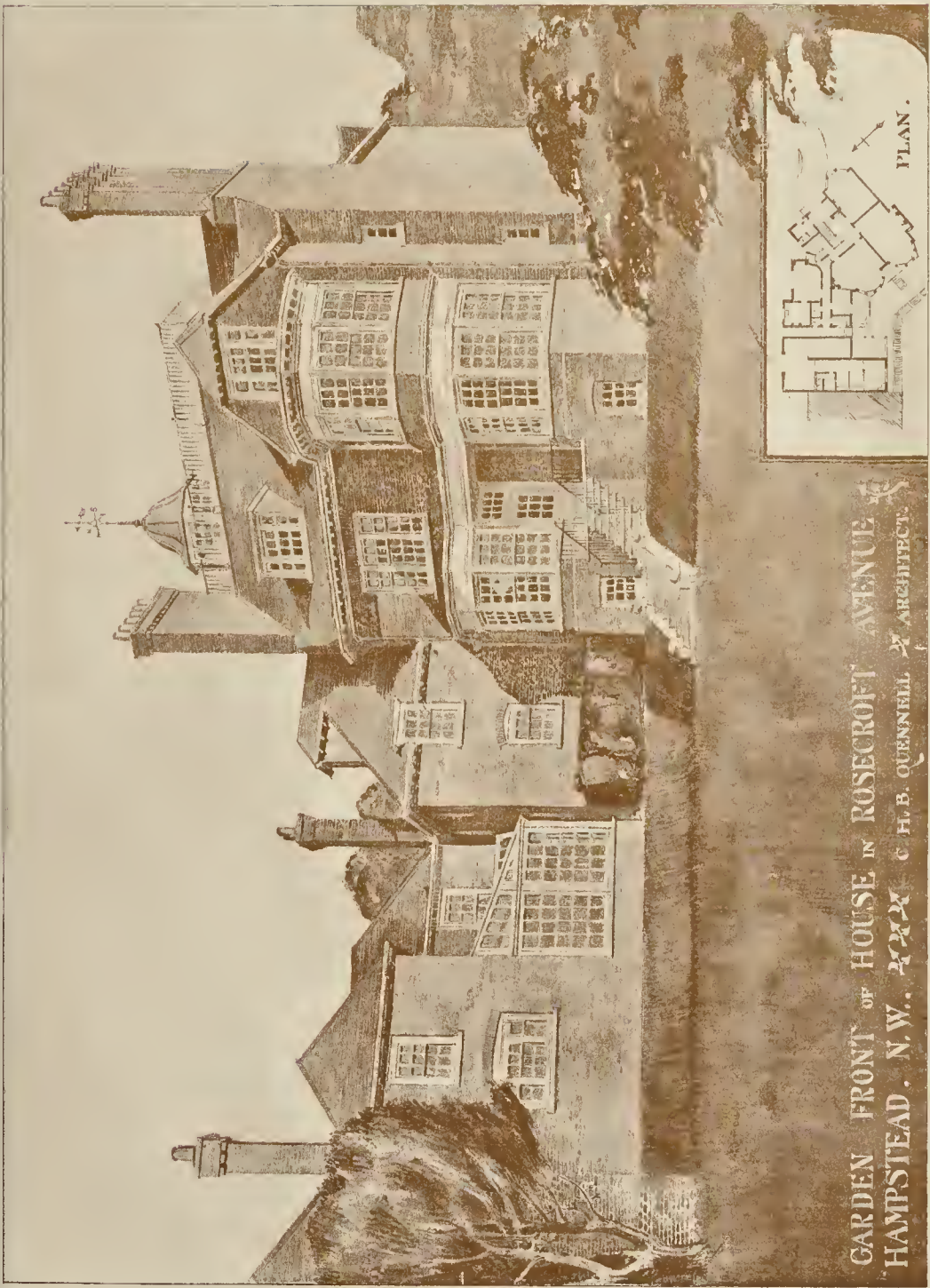
INK-PHOTO, SPRAGUE & CO. L. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

PROPOSED CHURCH OF ST MARTIN'S, KNOWLE.—MR. H DARE BRYAN, ARCHITECT



THE BUILDER, JUNE 1, 1901

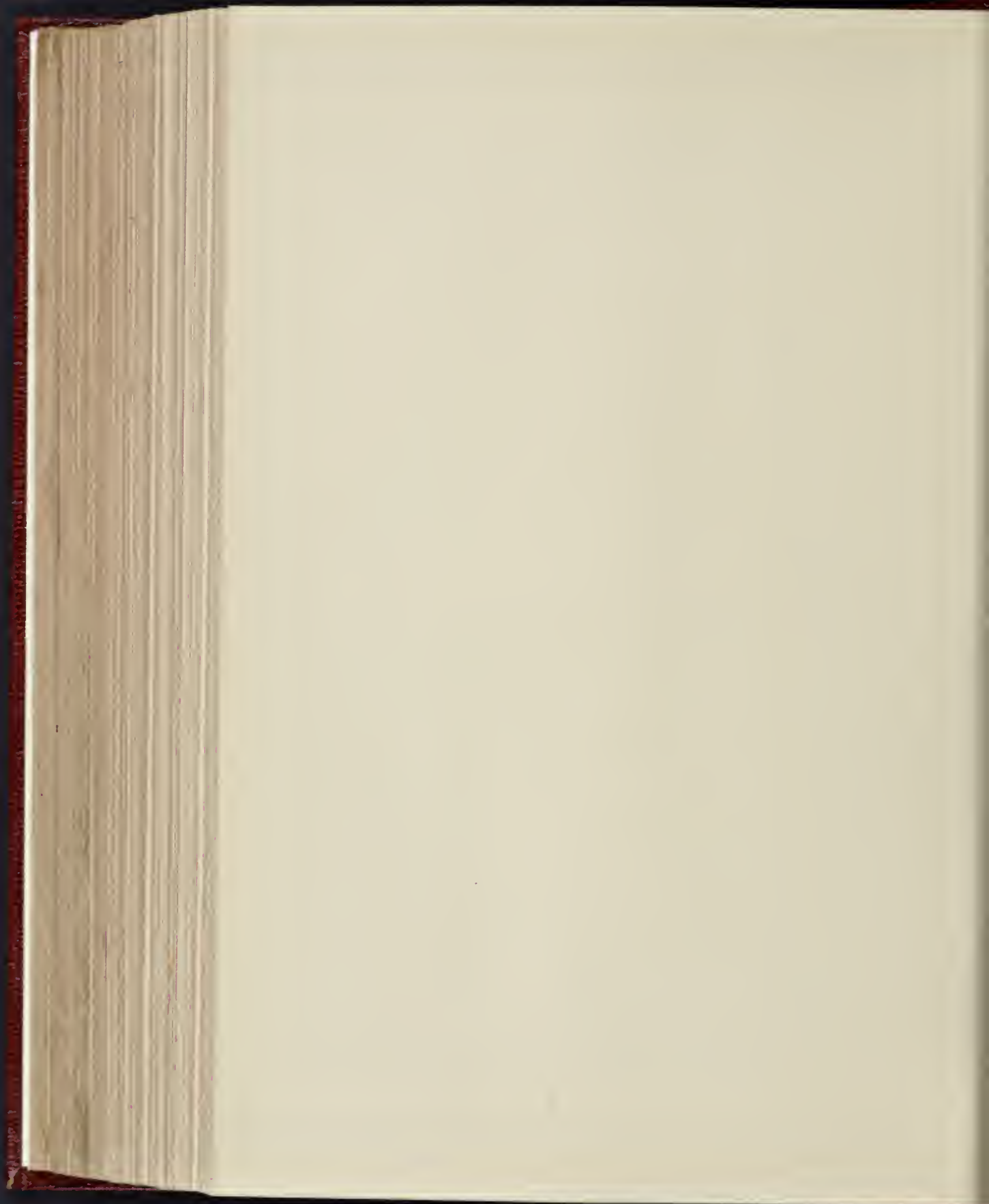




GARDEN FRONT OF HOUSE IN ROSECROFT AVENUE
HAMPSTEAD. N.W. *CCCX* © H.B. QUENNELL ARCHITECT.



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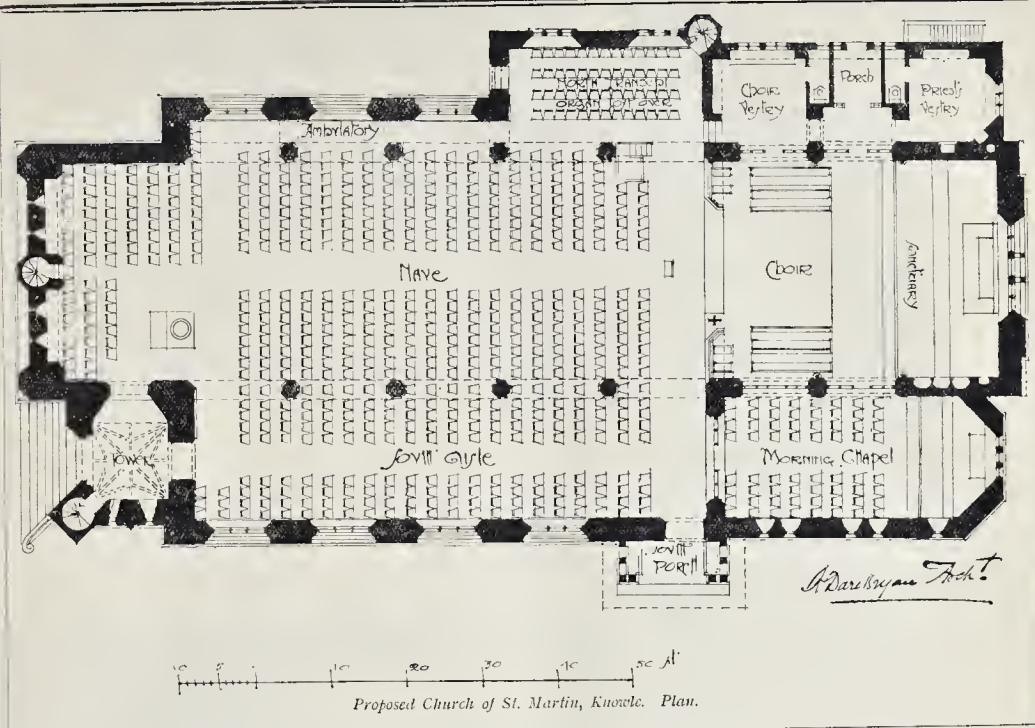




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OLD PARISH CHURCH, SHANKLIN: NEW LYCH-GATE.—MR. A. C. BLOMFIELD, F.R.I.B.A., ARCHITECT.





PROPOSED CHURCH OF ST. MARTIN, KNOWLE, BRISTOL.

This design was submitted in a limited competition for one of the new churches under a scheme of church extension in the diocese of Bristol. In harmony with the mother parish church a rather "high" ritual was arranged for, one of the features being the particularly open view of the altar and the ambulatory for processions. Internally the church would be of local stone, with a green stained oak-pannelled door around walls of nave and piers; the spire was to be covered with oak shingles.

The drawing was hung at the Royal Academy, 1899. H. DARE BRYAN.

LYCH-GATE, SHANKLIN CHURCH.

This lych-gate, which was the gift of a resident of Shanklin, is composed of oak, with walling of local stone. Messrs. Cornish & Gaymer, of North Walsham, were the builders, and Messrs. Gillett & Bland, of Croxford, supplied the clock, the total cost being 260l. The architect was Mr. Arthur Blomfield, M.A.

IMPROVEMENTS AT THE COVENT GARDEN OPERA HOUSE.

The circumstances under which opera is carried on in this country are necessarily peculiar, seeing that the Covent Garden Opera House is by no means a public building in the ordinary sense, but merely a structure erected on lease on the Duke of Bedford's estate, held for some forty or fifty years by a syndicate composed for the most part of wealthy amateurs. The principal interest of these wealthy amateurs is to have the musical representations they favour during that limited "run" of eleven weeks which happens to coincide with the fashionable season, and to have the arrangements for the performances made in such a way that the Opera House can also be used as a kind of social rendezvous. Most of the members of this syndicate hold their shares (or debentures) at a small nominal interest; or, in other words, the principal portion of the capital necessary for the opera has not been contributed for the purposes of gain, but solely with a view of making possible that which would be impossible if worked solely on commercial lines. Most of the shareholders must hence be looked upon

as patrons rather than partners in our operatic enterprise.

Covent Garden Theatre is an old building, the principal walls of which have been standing for many years, although the internal arrangements were materially remodelled after the notable fire of some forty years back. As is well known, the famous Opera House is badly located in an insalubrious neighbourhood, cramped in on all sides, and lacking such approaches as one would like to see associated with the Temple of Art.

When this House was taken over by its present owners some three years back, its defects were well known and attention had to be directed to such of the unsatisfactory features as might tend to hamper their scheme.

In the first place, the bad equipment of stage appliances, which were entirely out of date, seemed to prevent any semblance of an artistic production. The offices were so ill-placed, inaccessible, and unpractical in arrangement that the annual expenses threatened to be enormous. Many of the modern protective measures associated with a theatre were absent, and the confidence of the public might be shaken—in fact, when the syndicate took over the House there was merely an installation of gas for lighting purposes, whilst, of course, the electric light should long ago have been installed. In the auditorium, too, there was much to be complained of—the protruding stage was exceedingly ugly, to say the least of it; the orchestra, which was built so far into the auditorium, made the seating arrangements difficult. Further, the approaches, particularly to the stalls, were highly inconvenient, not to say dangerous. The approaches for carriage traffic, difficult in any case, were complicated by the fact that only one line of carriages could put down or pick up; whilst an additional exit used by the box-holders into Floral-street also left much to be desired.

Notwithstanding the financial position of the owners, which, as has already been explained, is based primarily on what we might term a patronage rather than a business basis, money has been procurable to assist the Directors in overcoming some of these defects, and it is the successful overcoming of the primary defects and difficulties that we now have to deal with, bearing the peculiar circumstances of the case in mind.

Firstly, the stage had to be remodelled, the actual structure raised and fully re-equipped; secondly, the entire offices, stores, &c., had to

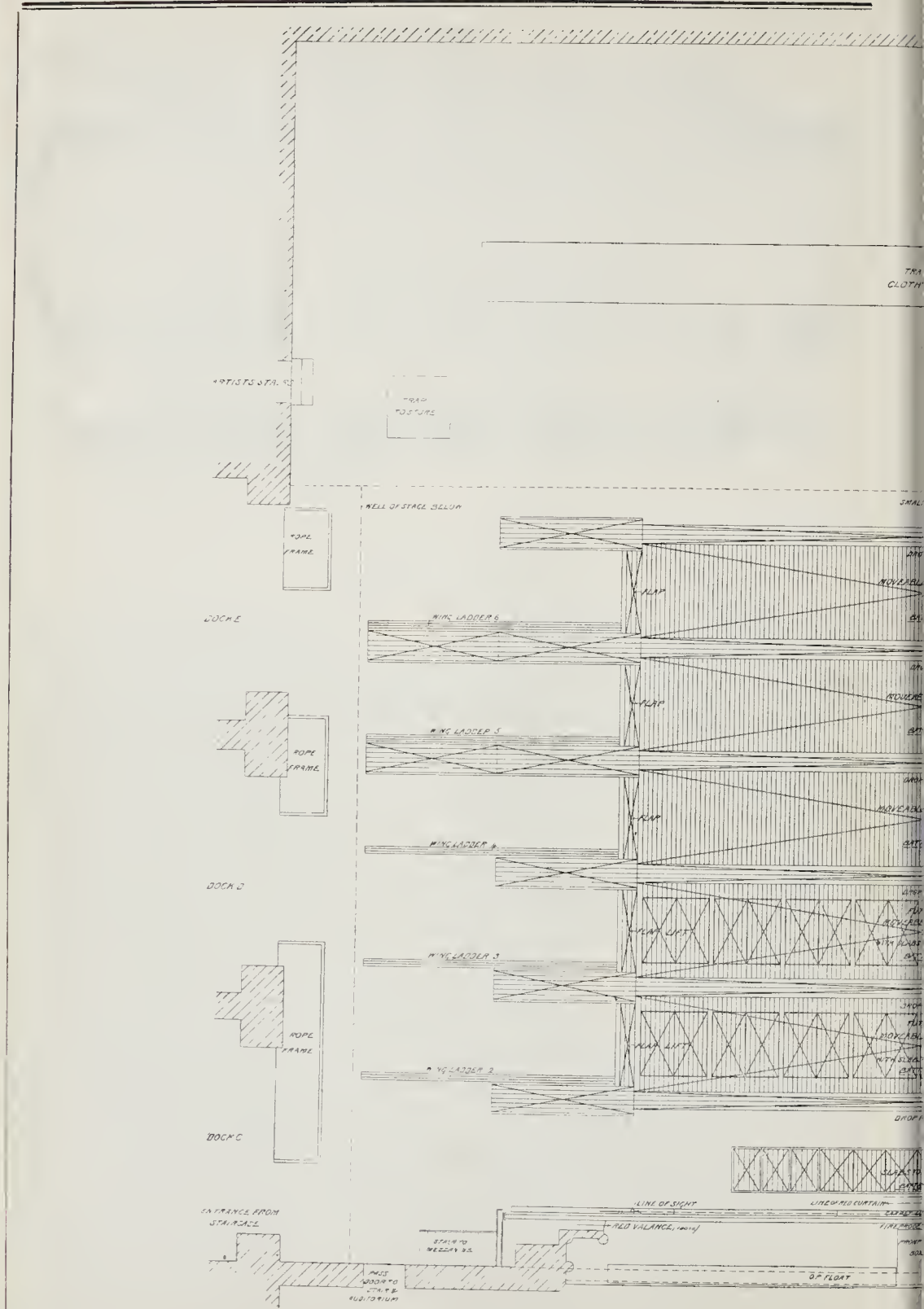
be remodelled; and thirdly, the auditorium with its approaches had to be improved. Lastly, innumerable installations, such as that of the electric light, had to be dealt with.

As far as this electric lighting was concerned, the directors proceeded with it from the very outset, as also with a number of minor improvements which were undertaken during the odd months intervening between the opera season and the ball seasons of 1899 and 1900, but the really important part of the improvement scheme only saw its completion during the last six months, when, by a bold stroke, it was decided that, ball season or no ball season, a winter of eight months was to see the final rejuvenation of the Opera House stage. The opera season of last year closed on August 3, 1900, and it required three or four weeks for the scenery to be cleared in the usual way. Work was, however, immediately commenced on the morning after closing. The first operation, comprising the alteration of the auditorium and the formation of a special corridor and some new entrances, was taken in hand contemporaneously with the second, which comprised the raising of the roof over the stage. The whole of these two sections of the improvement scheme were completed by October 15, the main roof alteration being ready on October 8.

The roof alteration comprised a span of 90 ft. to a width of 70 ft., at a height of 90 ft. above the ground, without any facilities for storage accommodation in the vicinity; the building had to be kept waterproof during the alteration; and the stage hands and mechanics were working below whilst the alteration was going on above. The scaffolding arrangements alone were most complicated, for a system of suspended scaffolding had to be applied, no vertical support being obtainable on the span of 90 ft. When the raising of the roof was completed, the "gridiron" had to be laid in a similar way from suspended scaffolding.

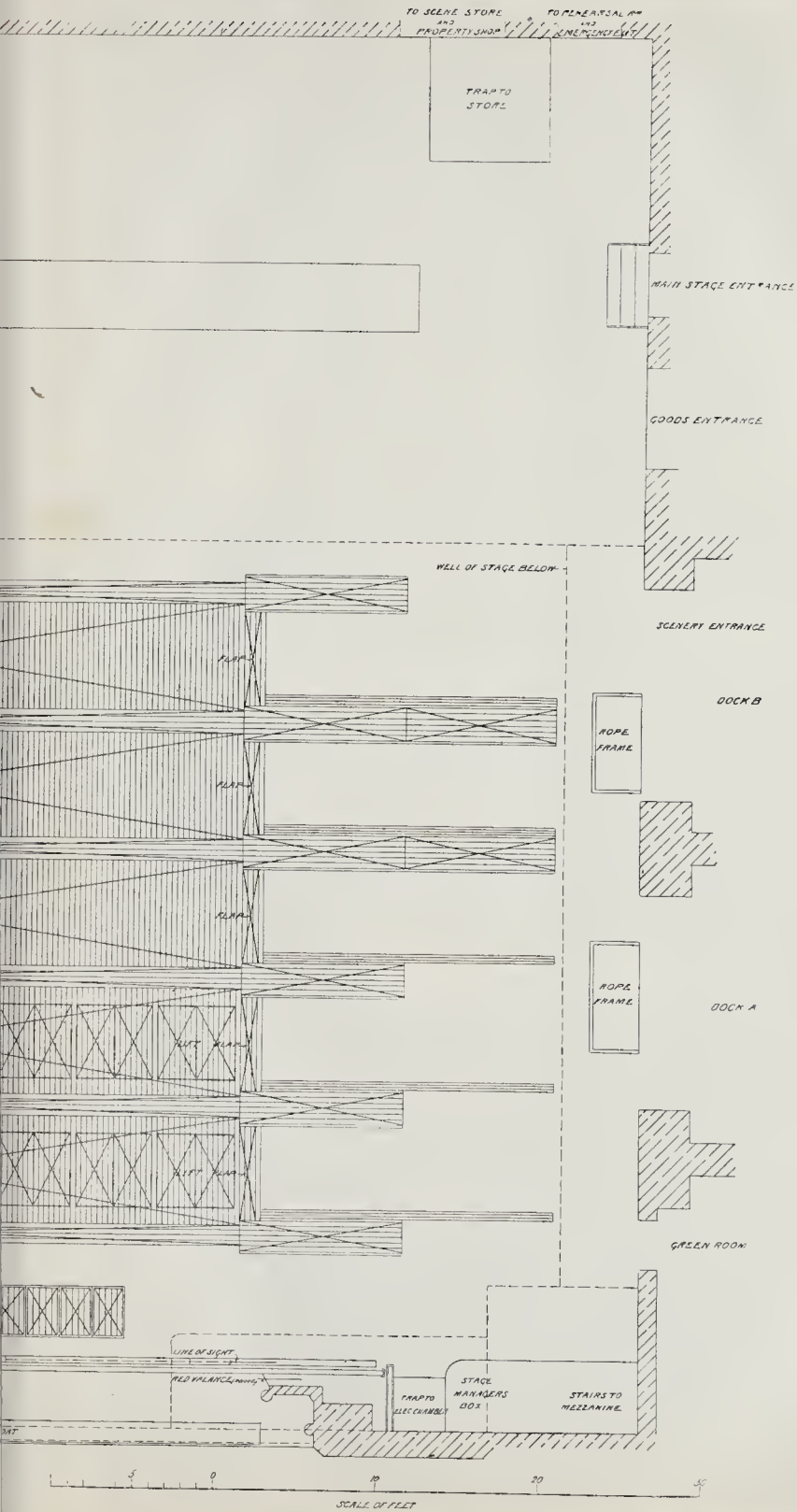
Almost contemporaneously with these alterations, a large fire-resisting curtain was being fitted in the proscenium opening, and the walls between stage cellar and auditorium being built. The curtain was put into position by October 15, so that Mr. Rendle was able to take up his tenancy for his ball season, and the first ball was actually given on October 20.

A large scene store at the back of the stage was taken in hand somewhat later than the first-named work, i.e., in September, and was completed by November 1, 1900.



STAGE

Plan of Stage, Covent Garden Theatre. As remodelled.



in the direction of Mr. Edwin O. Sachs, architect.

A general remodelling of a large wing at the back of the house was thereupon taken in hand, and was completed by January 1, 1901, by which time the new hydraulic lifts in the staircases were in working order, and the great removal of stores into their different new places could be undertaken.

On January 4 the stage floor was opened and gutted. The stage was reconstructed, and the new stage floor was closed in on April 4, when the whole of the work was practically completed, with the exception of some minor mechanical details which, trifling in themselves, were, however, of such a character as to prevent entire freedom on the stage until May 1. The gutting of this lower portion of the stage comprised by itself a wreckage of nearly 1,000 cartloads of timber and the erection of 150 tons of complicated steelwork and a very large amount of machinery.

It will thus be seen that the two principal problems, *i.e.*, that of raising the roof and that of gutting the stage, occupied respectively two and three months. The circumstances were, of course, very peculiar, owing to lack of space and the enormous quantity of scenery that had to be handled to make room for the men, and much of the work was of an exceptionally dangerous character and of considerable risk to the workmen employed. Nevertheless, not a single accident, much less fatal casualty, occurred.

The results, both in time and in lack of accident, must be attributed to a great extent to the co-operation of all parties concerned, not forgetting the artisans and labourers, who were, to a great extent, new to the class of work required, and Mr. Sachs, who acted as architect for the work throughout, is particularly anxious to acknowledge the assistance rendered him by the contractors and their representatives, and the cordial manner in which the various firms worked hand in hand under very trying conditions.

The new opera season actually commenced on Monday, May 13.

Turning now to the drawings which we illustrate, we see the Opera House as it stands after the improvements, and it will be observed that much that used to seem very ragged in plan has now been squared up in such a manner that the general scheme might almost be termed symmetrical. Thus, when we enter the main vestibule, which can now be approached by two rows of carriages—*i.e.*, private carriages under the porchway and cabs under a Bow-street awning—we find a double entrance leading into a broad stalls corridor, which formerly used to serve the purpose of a kind of lumber-room and general store. From this corridor we can either reach the stalls by going up some steps that are centrally placed, or by two entrances at either end of the corridor. There are hence now three exits for the stalls, and it will be seen that besides the ordinary exits through the grand vestibule, a special lobby and exit leading directly on to Floral-street has been created.

Next, in the auditorium itself, the apron of the stage has been cut off and the orchestra now practically takes the place of the apron. The members of the orchestra are no longer hidden underneath the stage, and as the wall against which they play has been equipped with light pitch-pine casing and a double flooring put underneath the orchestra, affording a vacuum of 3 ft. or 4 ft., the sound has naturally improved both in clearness and carrying power.

Of other improvements noticeable on the plan as far as the orchestra is concerned, it may be noticed that the management have better office accommodation, and that the lavatories have been improved.

Turning now to the stage, but without going into any question of mechanical detail, we find a thoroughly modernised symmetrical stage, with a good-sized back stage cut off from the auditorium by a fire-resisting curtain. The stage has now its proper height, which allows for cloths to be taken up without any kink; all superfluous wood and rope work has been removed; and whilst the stage itself has been divided up into sections which can be raised and lowered on the Sachs patent-bridge principle, worked electrically, everything above stage level has been equipped on a counter weight system, according to the Brand patents.

With the stage as we now find it, every effect that a stage-manager can desire is obtainable with a minimum of manual labour, but it is only to be anticipated that it will be

some time before those in charge of the stage can appreciate the possibilities at their command, or comprehend what the systematic stage management of the Continent really means. At present, to judge from the performances of the first couple of weeks, one would think that the captain of a fishing smack was trying to manage a torpedo-catcher. Of course, there has been little or no time for rehearsal, but given mechanics rather than stage-hands, and stage engineers rather than stage-carpenters, things will, no doubt, gradually right themselves.

If we now turn to the back wing of the house we see that the storage arrangements have been entirely remodelled and a good supply of rehearsal room provided; and facilities for storage and rehearsals are at last available at the Opera House, and it is to be hoped that proper use will be made of the modernised accommodation provided.

Speaking generally, one might say that the Opera House has at last been brought up to date, and that it has been brought up to date after careful consideration of the Continental models, but without the slavish imitation which would be out of place where the circumstances are so peculiar.

Irrespective of the technical assistance obtained by the management, the members of the Syndicate, and particularly Lord de Grey and Mr. H. V. Higgins, may be considered to have done a great deal towards giving England better scenic equipment, for by one bold stroke London can at last boast of an example of stage mechanism which accords with the position of technical science in this country, and should serve as a pattern to other theatre owners.

The following are the contractors engaged by Mr. Sachs for the execution of the work—

The general contractors were Messrs. Colls & Son (manager in charge, Mr. Collins; foreman, Mr. Dowse). The ironwork contractors for everything above stage level were Messrs. Lindsay, Neal, & Co. Limited; whilst the entire complicated structural and mechanical ironwork below stage level, including the stage "bridges" and lifts, was by Messrs. Drew-Bear, Perks, & Co. (manager in charge, Mr. Simco). The electrical power plant for the "under machinery" was provided by the Thames Ironwork Shipbuilding Company, Limited, of Blackwall (manager in charge, Mr. Flood); whilst the whole of the elaborate counterweight mechanism above stage level was provided by the well-known Berlin stage mechanist and contractor, Mr. F. Brandt, who personally attended to the installation of his appliances in London. The fire-resisting curtain was by Messrs. Merryweather & Sons, Limited, and the alterations in the auditorium by the Army and Navy Auxiliary Supply, Limited (manager in charge, Mr. Player).

OBITUARY.

MR. BRYDON.—We greatly regret to announce the death on Saturday last, after a short and painful illness, of Mr. John McKean Brydon, a Vice-President of the Royal Institute of British Architects, of No. 77, Newman-street, Oxford-street, and No. 31, Steele's-road, Haverstock-hill, N.W. Mr. Brydon was born in 1840 at Dunfermline, where he received his earlier education. In after years he became a leading and highly popular member of the Fife Association in London. When sixteen years of age he began his professional career, for which he had already displayed a marked aptitude, in Liverpool. Then, having served under Mr. Bryce, of Edinburgh, and Mr. Campbell Douglas, of Glasgow, he came to London as a member of the staff of Messrs. Shaw & Nestfield. He was elected a Fellow of the Institute in 1881, and a Vice-President for the sessional years 1899-1900 and 1900-1901; he was also appointed a member, 1900-1901, of the Art Standing Committee. He had been on the Council of the Institute during many years, taking an active part in its general work, and especially in that of the Art Standing Committee; indeed, it is not commonly known that when he first began to practise independently in London he devoted most of his powers to the designing of furniture. From that comparatively limited sphere he turned his attention to domestic architecture, and at length found his range in the planning and designing of public buildings. Meanwhile, he had made many visits to Italy for the purpose of increasing his knowledge of the traditions and examples of classical architecture and design.

Amongst the earlier works which brought his name and talents prominently into public notice we should mention the St. Peter's Hospital for the Stone in Henrietta-street, Covent Garden, in 1883-1884, and the Chelsea Vestry Hall, of which

latter building we published drawings of the south elevation, with details and two sections, on May 2, 1885. In 1887 he exhibited at the Royal Academy the designs for the West Kensington Congregational church prepared by him conjointly with Mr. James Cubitt, and in the following year his competitive designs for the new Municipal buildings at Edinburgh, two elevations and two plans of which we had illustrated on June 18, 1887. On May 7, 1889, the present Queen Consort laid the first stone of his New Hospital for Women in Euston-road, St. Pancras. On November 9 of that same year, we published a perspective view of his design for the Ladies' Residential Chambers in Chancery-street, Bloomsbury. Of his other architectural works at and about that period we may cite the Village Hall erected at Forest-row, Sussex, in 1892; for Mr. H. R. Freshfield, of Kidbrook Park (May 20, 1893*), and, amongst country houses, "Lewins," in Kent, for Mr. Joseph Robinson; "Bournemead" at Bushey, Hertfordshire (May 20, 1893*); "Pickhurst," Surrey; the studio at the well-known French painter M. James Tissot's Château de Buillon, near Besançon, together with the enlargement and remodelling of that old château (June 15, 1895, and May 1, 1897*), in respect of which M. Vielle, of Besançon, acted as resident architect on the spot. Shortly after that time Mr. Brydon won the first premium, upon the award of Mr. William Young as assessor, in the competition for the Municipal Buildings at Bath, which were opened on June 11, 1895. His designs are published in our columns of January 9, 1892 (elevation in High-street and two plans), May 28, 1892 (perspective view), and July 10, 1897 (the Council chamber). The designs for the furniture of the Council chamber were prepared by himself. Mr. Brydon's architectural employment in that city extended over a period of some seven or eight years. His works there comprise (1) the Technical Schools (1895-6); (2) an extension, at an estimated cost of 25,200*l.*, of the Pump Room, of which his first premiated designs we illustrated on March 10, 1894 (north elevation, section, and two plans), June 9, 1894 (perspective views of the interior and exterior), and May 25, 1895 (exterior view, revised design, proposed treatment of the interior of the Roman bath, plan of additions to pump-room, and plan of pump-room ground floor). His designs as ultimately carried out for the Mineral Baths Committee, after consultation with Mr. Alfred Waterhouse, were in some degree modified as compared with those he had submitted in the competition, less prominence being given to the concert-room, the other accommodation being reduced in extent, and the *schola* only of the old Roman bath being covered over; (3) the Victoria "Diamond Jubilee" Art Gallery and Library, opened in May of last year—see our illustrations of May 7, 1898; and (4) his architectural treatment of the Roman bath—see our illustration (from a photograph), October 23, 1897. The Victoria Art Gallery at Bath completes an imposing block, which embraces the Municipal Buildings, the Courts of Justice, the City Hall, the Technical Schools, and the Reference Library. In a competition held ten years ago for the rebuilding of the Whitefield Chapel in Tottenham Court-road, Mr. Brydon gained the second premium for his designs upon the report of Professor T. Roger Smith. In the competition (May, 1898) for the Taunton Town Hall he was awarded the second premium of fifty guineas, upon the adjudication of Mr. Mountford as assessor; and in that for the New Free Library, Wolverhampton, he won the second premium, Mr. Alfred Waterhouse being the assessor (February, 1898).

His successful work at Chelsea was followed by the selection of his plans and designs for the South-west London Polytechnic in Manresa-road, Chelsea, of which the then Prince of Wales laid the foundation-stone on July 23, 1891 (March 21, 1891, perspective view with two plans*), and by his winning the first premium for the Free Public Library (June 8, 1889, front elevation in Manresa-road, with plan, and January 24, 1891, perspective view and two plans)* opened on January 21, 1891. To the Free Library he added in 1897 the Queen Victoria Gallery, erected after plans which provide for its enlargement hereafter. Mr. Brydon entered the competition for the West Ham Technical Institute and Free Library, his design for the public library portion of which we published on August 1, 1896. He prepared the plans and designs for the science laboratories at the London School of Medicine for Women in Handel-street, Brunsvick-square, to which he subsequently added another story (1897-9). Last year Mr. Brydon was nominated, with five other architects, to furnish competitive designs to the Corporation of London for the rebuilding of the Sessions House and Central Criminal Courts in the Old Bailey, on which occasion Professor Aitcbison was appointed assessor. The designs which Mr. Brydon prepared, we understand conjointly with Mr. J. S. Gibson, are illustrated in our number of August 25, 1900. In 1898, being one of the eight architects who were recommended to the Government by the Royal Institute of British Architects for the new public offices, he was appointed architect of the block to receive the Local Government Board and the Board of Educa-

*Illustrations in the *Builder*.

tion, for which a site has been cleared in Parliament and Great George streets. Mr. Brydon was engaged upon that, his most important work, at the time of his death, and it is painful to recall that Mr. Young, who at the same time was appointed architect for the War Office block in Whitehall, was similarly deprived through death from seeing the fruition of his labours. Mr. Brydon's designs are illustrated in the *Builder* of March 25, 1899 (Parliament-street front and plan), and May 5, 1900 (the Circular Court), and were on view in the Royal Academy Exhibition, 1900. In February, 1897, Mr. Brydon was nominated by Professor Atchison, R.A., as the then President of the Institute, for the post of assessor of the competitive designs for the Technical College at Sunderland. He also acted in that capacity in respect of the South-end-on-Sea Municipal Buildings competition, awarding the first premium to Mr. H. T. Hare (1898). He was author of several essays and treatises upon professional subjects, including the following papers, reported *passim* in our journal:—On "The English Classic Revival of the Seventeenth and Eighteenth Centuries" (February 23 and March 2, 1899)* and "The English Renaissance of the Eighteenth Century" (February 14, 1891)*, both read at meetings of the Architectural Association; "Public Libraries" (February 25, 1893)* and "The Work of Professor Cockerell, R.A." (May 26, 1900)*, both read at meetings of the Institute. He was invited to read the last-mentioned paper to a meeting of the Edinburgh Architectural Association in March of the current year.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, LIVERPOOL.—On the 26th ult. a new church of the Order of Lourdes and St. Bernard's, the foundation stone of which was laid by Bishop Whitehead on June 17 last year, was opened. The church, which has been built next to St. Bernard's Schools, on a plot of land between Kingsley-road and All-street, consists of a nave and aisles, with baptistry and porches at the western end, and a chancel, with two chapels, sacristy, &c. The nave, which is 83 ft. long with a breadth of 48 ft., consists of five bays, in four of which the centre space is divided from the adjoining aisles by an arcading with stone shafts and moulded caps and bases, the fifth bay being occupied by the organ gallery. The body of the church is lighted by four-light tracered windows in each bay, and by two similar three-light windows, with a circular window above in the western gable, which adjoins Kingsley-road. The principal elevation faces Kingsley-road, in the centre of which is a niche filled by a statue of the Virgin to whose honour the church is dedicated. Two entrance porches, one at either side of the west wall, extend the width of the front to 77 ft. The chancel, square-ended and flanked by a chapel on each side, is lighted by two side windows, and by a rose window in the gable, the latter being filled with stained glass, while a second window, representing Our Lord, with St. Bernard and St. Mary Alacoque, has been placed in the north chapel. The building is constructed of St. Helena grey bricks, with facings of red Runcorn stone to the windows and doors. The roof, which is open to the ridge inside, and panelled between the principals with moulded ribs, is covered with Welsh slates. The floor is of wood, with the exception of the baptistry and porches, which are laid with brown tiles. The church will be heated by means of hot-water radiators, and the building has been provided with electric light. The cost of the fabric is about 5,500. The building was done by Messrs. Roberts & Robinson, contractors, Liverpool, from designs and under the superintendence of Messrs. Pugin & Pugin, architects, of London and Liverpool, for whom Mr. M. Shanley has acted as clerk of works.

CATHEDRAL, BRISBANE.—The foundation-stone of the new cathedral at Brisbane was laid by the Duke of Cornwall and York on the 22nd ult. The designs were prepared, it is stated, by the late Mr. J. L. Pearson, R.A., and will be carried out by Mr. F. L. Pearson, in conjunction with Mr. W. D. Carole. The complete design, of which the probable cost will be 100,000, and which will provide 3,000 sittings, will not be carried out at present for want of funds, but it is proposed to begin with the choir and transepts to accommodate 1,200 worshippers. This will cost 25,000.

TRURO CATHEDRAL.—Mr. J. H. Dennis has increased from 10,000, to 15,000, his gift for the building of the central tower, to be known as the Victoria Tower, as a memorial of the late Queen. Mr. Pearson, the architect, has obtained an estimate for the erection of the tower, which, it appears, can be carried out at a cost somewhat less than the sum which Mr. Dennis undertakes to subscribe.

RESTORATION OF ST. JOHN'S CHURCH, SUNDERLAND.—The Church of St. John, in the east end of Sunderland, was re-opened on the 15th ult. after having undergone restoration. The work of restoration has apparently included in its scope everything except the shell of the building, the walls having required but little attention. The most noticeable of the alterations has been the removal of the three old galleries which ran round the church, and which, in

the end, were in an exceedingly tottering condition. The effect of this change means that, whereas the building would formerly hold about 2,000 persons, it is now capable of accommodating something like 600. The antiquated high-backed pews have disappeared, giving place to benches of a modern description. On the old-fashioned pews there were brass plates, on which were inscribed the names of the families who occupied them Sunday after Sunday. These interesting relics are to be placed together on one of the walls of the church. Perhaps the most interesting relics that have been replaced are the oak pulpit and the organ. A great deal of care has been concentrated on the alterations in the apse of the church, the beautiful chancel being now provided with new choir stalls. By the erection of two rows of oak pillars, the edifice has been divided into aisles. The walls have been treated by the painters in a way that harmonises with the general design of the scheme; the ceiling has been subjected to a thorough renovation; and in various other minor directions have renewals and improvements been carried out. The restoration has been executed under the direction of Messrs. Hicks and Charlewood, of Newcastle. The builders employed were Messrs. Scott, of Sunderland.—*Newcastle Journal*.

U.F. CHURCH, ABERDEEN.—A new U.F. church is to be erected at the corner of King-street and Urquhart-road, Aberdeen. Messrs. D. & J. R. McMillan, Aberdeen, are the architects.

RESTORATION OF FRENZE CHURCH, NORFOLK.—Frenze Church, about two miles from Diss, has just been reopened after restoration. An entirely new oak roof has been constructed, a block floor with concrete bed laid, the pulpit and reading-desk restored, and slabs on the floor have been taken up and rearranged. An altar-stone has been taken up in the body of the church and now forms the Communion table. Other improvements include a new altar-rail and a new entrance door. Messrs. A. R. Barker & Son, Strand, London, were the architects, and the work has been carried out by Mr. William Limmer, builder, Dicketburgh.

RESTORATION OF ELKESLEY CHURCH, NOTTINGHAMSHIRE.—The Duke of Newcastle, who is the proprietor to the living of Elkesley, is shortly, it is stated, to restore this church at an outlay of 1,400. The plans prepared by Mr. Thompson, of London, have been approved. The restoration will include a new roof for both the nave and chancel; new chancel arch; the whole of the nave and chancel will be panelled in oak, prolongation of north aisle west to the extent of the tower; a new north and south porch; the greater part of the north aisle will be rebuilt; a window will be inserted in the east end of the north aisle; the vestry enlarged; and a new organ-chamber built.

UNITED FREE CHURCH, CULTS, N.E.—It is proposed to erect a new United Free church at Cults from the plans of Messrs. D. & J. R. McMillan, architects, Aberdeen. The church is Gothic in design. The gable of the church faces the public square, with a tower on the west. In this tower is situated the main doorway, and there is another doorway leading to the staircase to the east of the gable. The church is cruciform in plan, having a centre seating area, two side seating areas, and, in addition, the transepts. There is also an apse behind the pulpit, where provision is made for an organ. The church is seated to accommodate rather over 600. Immediately adjoining the pulpit is situated the vestry. To the east of the church is situated the hall, accommodation. It consists of 20 ft. by 20 ft., with session house adjoining, 26 ft. by 19 ft., the latter being so arranged that for large meetings it can be thrown into the large hall. There is also a room provided as a ladies' work-room, 26 ft. by 18 ft. 6 in., while a tea kitchen has also been provided. The cost of the buildings is estimated at about 4,000.

RESTORATION OF SKEEFLING CHURCH, YORKSHIRE.—The parish church at Skeffling was re-opened on the 17th ult. after restoration. The work was carried out under the guidance of Mr. F. S. Brodrick, of Hull.

WESLEYAN SCHOOL-CHAPEL, SHIPLEY.—Memorial-stones were laid recently in connexion with the erection of a school-chapel for the Wesleyan denomination in Shipley. Mr. G. F. Danby, of Leeds, is the architect for the school-chapel. His plans provide for a central assembly-room, 58 ft. long by 34 ft. wide, which will be capable of seating 400 persons on the ground floor. A gallery extending round three sides of the building will seat 250 more. At one end will be the rostrum and choir gallery. From the ground and gallery floors access will be obtained to twelve classrooms. There will also be other apartments. All the internal woodwork will be of pitchpine, and the building will be of pitch-faced local wallstones. For heating purposes the low-pressure hot-water system is to be adopted. The cost of the structure is estimated at 3,000. The principal contractors are Messrs. Deacon & Son, Shipley, and Messrs. H. & T. Riddough, Cross Hills.

HARRISVILLE NEW PRESBYTERIAN CHURCH, BELFAST.—On the 21st ult. four foundation stones were laid for the new Presbyterian church in Casement-street, Harrisville. The style of the new building is Gothic. The building will be 85 ft. by 44 ft. There will be a large gallery at the end of the building, and provision is made for extending

the capacity of the church in future by galleries at either side of the building. Provision is made for a committee-room, session-room, cloakroom, library, and lavatories. The whole of the interior of the church will be of pitch pine, and particular attention has been paid to heating and ventilation. The windows are to be fitted with approved wrought-iron ventilators, and the work has been entrusted to Messrs. Ward & Partners, Belfast. Mr. W. C. Gault is the builder; Mr. A. Boyd is the architect.

OXFORD-PLACE CHAPEL, LEEDS.—The trustees of Oxford-place Chapel, Leeds, are about to proceed with the erection of new buildings and a tower adjoining the present structure, and occupying the vacant plot that exists to the north and fronting the Town Hall. This was part of the original building scheme, only that in the place of a projected Synod Hall and classrooms it has been decided to erect a series of office chambers. The tower will rise to a height of 120 ft. At the foot of the tower there will be an entrance vestibule, and the structure is to come forward to the line of the chapel steps, and be connected with the chapel building by what may be termed a curved sweep. At the back an addition is to be made of an octagonal-habed room adapted for the purposes of a girls' club. There will be three floors of offices, and the material used in the erection of the buildings will consist of brick faced with stone. The work is in the hands of Mr. G. F. Danby and Mr. William H. Thorp, architects, of Leeds.

RESTORATION OF PARISH CHURCH, MELKSHAM, WILTSHIRE.—In connexion with the restoration of the parish church at Melksham, a figure of St. Michael has been placed in a niche over the north door. The figure is of Painswick stone and was carved by Messrs. Harry Hems & Sons.

TRINITY PRESBYTERIAN CHURCH, REDLAND, BRISTOL.—On the 21st ult. the foundation-stones were laid of the new Presbyterian church which is being erected at the far end of Cranbrook-road, Redland. The plans have been prepared by Messrs. P. Munro & Son, of Bristol. The church, which is designed in the Perpendicular style, will be built with red Pennan stone and Bath stone dressings, and will contain nave, transepts, aisles, chancel, minister's vestry, choir vestry, church parlour, lecture-hall, classrooms, and caretaker's residence. The corridors, passages, lavatories, and part of the chancel will be laid with encaustic tile pavement, and the chancel steps will be of Red Wilderness Forest of Dean stone. The floor of the church and the whole of the subsidiary buildings will be laid with pitch-pine blocks. The roofs will be covered with red Broseley tiles. The pews will be of selected pitch-pine, and open, and the doors of English oak. The roofs will be open-timbered in pitch-pine, the nave having hammer-beam principals, all the main timbers being moulded. The roof of the chancel will be wagon-shaped, with moulded ribs. The glazing throughout will be in tinted cathedral glass. The heating arrangements for the church and subsidiary buildings will be by means of hot water, low-pressure system, with pipes and radiators. The church will be lit with electric light, and will have seating accommodation for between 600 and 700 worshippers. The site is on the corner of the roadway opposite to the New Church and close to St. Katharine's Church.

LABORATORIES, NONCONFORMIST SCHOOL, BISHOP STORTFORD.—At the Nonconformist Grammar School at Bishop Stortford new laboratories have just been added at a cost of 1,500. The site is on the corner of the roadway opposite to the New Church and close to St. Katharine's Church. The architects, and Messrs. J. L. Glasscock & Sons, Bishop Stortford, were entrusted with the building. There are a physical laboratory, chemical laboratory, and lecture-room, each about 30 ft. by 20 ft., also a preparation room and stores. They are fitted with fume closets, special tables, and apparatus. The building is of red brick, with stone dressing. The engineers were Messrs. Ashwell & Nesbit, Bedford-row, and the fitters Messrs. Hammer & Co., the Strand.

SCHOOL, PRESTON.—The corner stone has just been laid of Plungington-road new school, Preston. Plans of a new school capable of accommodating 300 children, on the west side of Plungington-road, have been prepared by Messrs. Myres, Veivers, and Myres. The total cost is estimated at 2,000. The present structure comprises a schoolroom, 66 ft. by 26 ft., to accommodate 100, and to be divided by moveable partitions to form classrooms. There are also a classroom to hold sixty and a babies' room for a similar number. Adjoining these will be a mistress's room, cloak and lavatory rooms, &c. The materials employed in the building of the school are brick and stone for the outside, the roofs being of open timber. All the rooms will have a glazed brick dado about 4 ft. high. The contractors are Messrs. T. Croft & Sons, Preston.

LIBRARY, LIVERPOOL.—A new branch library is in course of erection at the corner of Windsor-street and Upper Parliament-street from designs by Mr. Thomas Sheldermine, the Corporation Architect and Surveyor. The principal front elevation and leading main entrance will be in Windsor-street. Leading from the main central hall on the right is the ladies' reading-room, 56 ft. 6 in. by 30 ft. On the left is the general or men's reading-room, 66 ft. by 30 ft. In the centre of the building will be the lending department and book store. There will be

* Reported in the *Builder*.

upwards of 25,000 volumes of books in this branch library. From the vestibule there will be a staircase, by which access will be obtained to the basement, where is situated the boys' reading-room, 47 ft. by 30 ft. In addition to the public accommodation above described there will be a mezzanine floor, which will provide accommodation for books, for the repair of books, and for the staff. On the ground floor will be the librarian's-room, and on the first floor an assistants' common-room. The entire building will be of fireproof construction. The main walls will be of red wire-cut Ruabon bricks, with Cefn stone dressings, and the roof will be covered with Cumberland green slates. The style adopted is the English Renaissance. The erection of the building, the contract price for which is upwards of 12,000l., has been in progress now some weeks.

INSTITUTE, WALWORTH.—The new buildings in Larcum-street, Walworth, for St. John's Institute, have just been completed. There are four floors and a basement in the building. In the basement is the store for furniture required for concerts or lectures as well as the heating chamber and apparatus. On the ground floor there are the men's gymnasium, the boys' gymnasium, and boys' reading-room, with an entrance-hall and fireplace. On the mezzanine floor is the gallery to the large gymnasium, to be used as a dressing-room, with shower-bath, lavatories, and secretary's gallery attached. The first floor contains a meeting-room for allied clubs, a reading and writing-room, and a large billiard-room. On the second floor are twelve cubicles 10 ft. long by 5 ft. wide for resident members, each being lighted by a separate window, a bath-room, and separate shower-bath, with a range of lavatories, storeroom, broom, &c., and a dining-room. The kitchen and caretaker's rooms are placed in the attics. There is a lift serving all the floors, and hot and cold water is laid on to the sinks and lavatories on each floor. The furniture is made in oak from designs prepared by the architects, Messrs. Dunn & Watson, of Lincoln's Inn-fields. All the rooms and passages are lighted by electric light. The building has frontage to Larcum-street of about 66 ft., and the front wall is faced with salt-glazed bricks of a warm colour up to the gymnasium windows, over which there are balconies projecting from the billiard-room floor. Above this the walls are faced with yellow stocks with stone dressings. The contractor is Mr. John Marsland, Walworth.

GOLF CLUB-HOUSE, BILSTON, WOLVERHAMPTON.—A club-house for the Wolverhampton District Golf Club has been erected on the club's ground at Bilston. The building has two stories, and was designed by Messrs. Johnson & Baxter, of Wolverhampton. Messrs. Hickin & Sons, of Willenhall, were the contractors.

CRICKET PAVILION, DUNFERMLINE.—A new pavilion for the Dunfermline Cricket Club has just been opened at Lady's Mill. Mr. T. Hyslop Ure was the architect, and the following were the contractors:—Building, Mr. James Stewart; joinery, Messrs. Mitchell & Kinghorn; tile and rough casting, Mr. John Robertson; plumbing, Messrs. Jas. Inglis & Son; plastering, Mr. William Ure; painting, Mr. Andrew Wardlaw.

WORKING MEN'S INSTITUTE, NANTMOEL, GLOUCESTERSHIRE.—The memorial stones have just been laid of a working men's institute to be erected in that part of Nantmoel known as Priceton. The hall will seat 1,000 persons and the cost will be about 4,000l. Mr. Jacob Rees, of Pentre, is the architect, the builder being Mr. Jenkin Phillips, of Nantmoel.

BUILDING IN ARBROATH.—The building trade in Arbroath has been fairly busy during the past year. A large number of plans for new buildings and alterations and additions to existing buildings have been approved and passed by the Commissioners. These include the new joint epidemic hospital; additions to Messrs. D. Fraser & Sons' engineering works; new electric power station in John-street West; reconstruction of Burnside Works; warehouse additions to the Dundee and Arbroath Confectionery Company's premises; and the reconstruction of the Star Hotel in High-street. During the year forty-nine different plans for new buildings and alterations or additions to existing buildings have been presented to and passed by the Commissioners. Among the principal improvements carried out by the Commissioners during the year are the blocking of Helen-street, the alteration of the roadway at the West Links old tollhouse, and the widening and taking off a sharp curve in Montrose-road.

MEMORIAL COTTAGE HOSPITAL, ST. ANDREWS.—The contracts for the new memorial cottage hospital, which is to be built on a site at Abbey Walk, have been fixed as follows:—Mason, Mr. Thomas Liddel; joiners, Messrs. T. Harris & Son; plumber, Mr. J. M. Morris; plasterer, Mr. A. R. McPherson; slater, Mr. Thomas Black—all of St. Andrews. The architect for the building is Mr. C. F. Anderson.

EMPIRE HOTEL, BUXTON.—Messrs. Spiers & Pond, Limited, have erected at Buxton an hotel called the Empire. The hotel is built upon a site in close proximity to the Pump Room, and stands in its own garden and grounds of twelve acres. The hotel possesses accommodation for upwards of 300 guests, and contains dining-hall, banqueting and ball room, a drawing-room, and numerous other

apartments, a spacious hall, and lounge. The architect of the hotel is Mr. Thomas Garner, and the builder is Mr. John Farnell, of Rugby. The furniture and decorations have been carried out by Messrs. Smees & Cobay, of London, W.

POLICE COURTS, BRISTOL.—Bristol Police-courts are to be extended from plans prepared by Mr. Henry Williams, architect. The extension of the courts has been made possible by the acquisition of properties on the north of the present building and at the rear of it. The same chief entrance will be used from Bridewell-street, but the general offices will be on the right hand, and the present general offices will become the office of the magistrate's clerk, &c., a separate entrance being made from the street to the general offices. In the basement there will be ample cell accommodation for males and females, with attendants. Offices will be provided on the first floor, with waiting-rooms; and the second floor will be occupied by the caretaker. On the ground floor two new courts will be provided—a large one, 41 ft. 6 in. by 30 ft., and a small one, 28 ft. by 25 ft.—while the present large court, which is 37 ft. 6 in. by 27 ft., will remain available. The existing small court will be used by the magistrates for an assembly-room. There will be a public waiting-room beyond the principal new court, and easy access will be afforded by corridors and doors to all parts of the building. The new courts will be wainscotted in oak, and the fittings and lighting will be similar to those in the present large court. The extension of the frontage will be made to harmonise with the existing elevation.

VICTORIA ARCADE, LOWESTOFT.—The Victoria Arcade at Lowestoft, which has been built by Mr. George Pitt upon the site of the old Baptist chapel and schools in the London-road, has just been opened. The building contains fourteen shops, with stockrooms over, four suites of offices, an assembly-room, cloakroom, and ladies' and gentlemen's lavatories. There is also a public landing and balcony on the first floor facing London-road, on each side of which is a refreshment buffet approached by a wide staircase from the Arcade. The building has been erected for Mr. George Pitt from designs prepared by Messrs. George Fitt & Co., Limited, architects and surveyors, Norwich and Lowestoft. The brickwork has been done by Mr. E. C. Pipe, of Lowestoft; the constructional ironwork by Messrs. Brooks, Lowestoft; the shop fronts and joinery by Messrs. Lambert Bros., Kirkley; and the painting and glazing by Mr. R. T. Peck, Lowestoft. The whole of the glazed bricks were supplied by Messrs. J. Woodward & Sons, Limited, Swindon; the Arcade roof by the Pennycook Glazing Company, Glasgow; the electric lighting by Messrs. Bush & Dryburgh, Lowestoft; and the whole enclosed by wrought-iron gates supplied and fixed by the B. and S. Folding Gate Company, London. Mr. W. Forster was clerk of works.—*Norfolk News.*

SANITARY AND ENGINEERING NEWS.

EXTENSION OF CALEDONIAN STATION, GLASGOW.—The Caledonian Central Station at Glasgow is to be enlarged. A description of the scheme was recently given in the *Glasgow Herald*. According to this, the extension will involve the construction of a new bridge over the Clyde. This bridge will be one of the broadest in the country. It will take nine additional lines of rails, which, with the four on the present bridge, will bring the total to thirteen. North of the Broomielaw, up to the south side of Argyle-street, the station will be widened to the extent of 175 ft., making an average width of 260 ft., while north of Argyle-street the station will be extended westward until it comes to the building line of Hope-street, making the main part of the station under cover about 340 ft. in width, as against 210 ft. in the present station. The nine lines of rails are furnished with an equal number of platforms, varying from 15 ft. to 22 ft. in width. When the reconstruction is completed there will be thirteen platforms, from 22 ft. to 30 ft. wide. The platforms now vary from 350 ft. to 680 ft. in length; under the new scheme they will run from 426 ft. to 900 ft. On the east side parallel platforms will extend almost to Annet-street, but on the west side the platforms will be carried practically as far south as the north line of the Broomielaw, where there will also be platforms for fish, fruit, and milk traffic extending to the edge of the river. A greater circulating area for passengers at the end of the platforms will be provided. This space will be 2,948 square yards in extent; the present one is only 550 square yards. At present only 100 carriages can be got into the station at a time, but when the extension is completed there will be standing room for 200 carriages. The area of the left luggage office will be 1,400 square yards as against 400 in the present station. The size of the parcels office will also be increased from 500 square yards to 2,300 square yards. This department will be constructed underneath the station at the level of the street, with accesses from Hope-street, where a large parcels hall will be situated in place of the existing premises in Union-street. There will be communication with the several passenger platforms by means of boists, of which there will be eight. A feature of the new station will be a cab rank about 1,000 ft. long, with a

platform at each side 800 ft. in length and 20 ft. wide. The entrance to the cab rank for empty cabs is by an inclined access from Hope-street. The booking office will remain the same in number as at present, but they will be greatly increased in size, more particularly the Union-street office, which will occupy a more important position than at present, and will be one of the chief offices in the station. It will be situated at the north end of the company's property in Union-street, where an access to the station will be given by means of a staircase 18 ft. in width. The intention of the company is to reconstruct all their Union-street property. It has a frontage to the thoroughfare of 200 ft., and a building has been designed by Mr. James Miller, the architect of the contemplated extension of the Central Hotel. The new property will consist of shop and office premises, about six stories in height. At the level of the platforms the rooms will be set apart for the use of the travelling public. There will be waiting and refreshment-rooms and other accommodation, and behind them offices will be constructed facing the street. The existing restaurant on the street floor will be restored. The new portion of the station is to be covered with an arched girder roof, except at the part crossing Argyle-street, where, in order to meet the wishes of the Corporation, it will take the form of a low verandah merely sheltering the platforms, and leaving the lines of rails open to the weather. With this break the arched roof will extend from the hotel at the north end of the station to the south side of Ann-street. The bridge over Argyle-street will have a screen on each side 18 ft. high, constructed of iron, timber, and glass, carrying out the roof work the west wall of the present station will be taken down and the new roof supported on iron columns. The bridge over the river will be 270 yards in length over all, with an average breadth of 40 yards, and will stretch from the north side of the Broomielaw to the south side of Clyde-place. The substructure of the bridge will be of masonry, the piers on the quays and in the river being founded on monoliths constructed of steel caissons built up with concrete and brickwork. The monoliths are to be founded on sand and gravel at a depth of 30 ft. below the bed of the river, the caissons being sunk into position by the pneumatic process. The piers of the bridge will be built of granite ashlar, hearted with blue brickwork. The superstructure is to be of wrought steel, the principal spans, five in number, commencing at the Broomielaw being in the clear 97 ft., 140 ft., 185 ft., 164 ft., and 61 ft. respectively. These will be spanned by steel girders having parallel angles, and placed at about 12 ft. centres. The main girders of the larger spans, those across the river, will be upon webbed girders; those over Clyde Place and the Broomielaw will be plate girders. Above these girders will be an ornamental lattice parapet girder thrown out and supported by ornamental brackets from the main carrying girders, and the bottom flanges of the parapet girder will be encased and finished in ornamental cast iron. The new bridge will differ from the present one, alongside in particular, that the trains will run on the tops of the girders in place of at the bottom. This enables use to be made of all the available space for rails, and it will be possible to have points, crossings, connexions, and junctions of all kinds on the bridge. Externally, the piers will be of ornamental granite ashlar, finished in towers rising above the parapet on the two centre piers. The end piers will be finished at a somewhat lower level, the contour of the line of the tops of the towers being on a curve of a circle. The existing station at Bridge-street will also, to some extent, be remodelled, and the proposal at present is that there should be eight lines running through it in place of four, as at present. It is further intended that the approach lines shall be improved by laying two additional lines of rails through Eglinton-street Station by the construction of another tunnel under Eglinton-street. A Bill for this work has been lodged in Parliament, and has already passed the first House as an unopposed measure. The extension of the Central Station Hotel will be made down Hope-street, in the direction of Argyle-street, and will not interfere in any way with the plan of the station, as the access for the empty cabs will be made beneath the building. In order to obtain ground for the extension, a large quantity of shop, warehouse, and office premises has been cleared away. The engineer for the undertaking is Mr. Donald A. Matheson, engineer-in-chief of the Caledonian Company. The contract for the bridge and relative works has been undertaken by Messrs. Sir William Arrol & Co., Limited, with whom are associated Messrs. Morrison & Mason, Limited. The substructure of the station, from Broomielaw to Argyle-street, is being made by Messrs. James Goldie & Son, and the carriage entrance and substructure of the hotel extension by Messrs. P. & W. Anderson. The work has been begun, and it will probably be finished in two years and a half.

NEW RESERVOIR, LLANELLY.—The Llanelly Urban Council are constructing an additional reservoir at a cost of 67,000l. The Surveyor reported progress to a special meeting of the Waterworks Committee recently, and subsequently the members inspected the work. The contract provides for completion of the work in July of next

year, but the contractor, Mr. Louis P. Nott, is prepared to bring it to a finish in March for a consideration of 1,000l.

ABERDEEN WATER SUPPLY.—Aberdeen Town Council have just appointed Mr. Charles Hawksley, M.Inst.C.E., Westminster, to report as to the best source of a new or additional water supply for the city.

WATER SUPPLY, WALLASEY, CHESHIRE.—On the 21st ult. Mr. E. A. Sandford Fawcett, an inspector to the Local Government Board, attended the public offices, Church-street, Egremont, to inquire into an application by the Wallasey Urban District Council for sanction to borrow 17,500l. for water-supply works, and an application by the Liverpool City Council for permission to borrow 145,000l. The estimated cost of laying a water-main from Hatchmere to the outskirts of the Wallasey district. Applications by the Wallasey Council to borrow 27,225l. for the construction of a reservoir at Gorse Hill, New Brighton, and 3,450l. for the formation of a street from Earlston-road to Sea View-road, Liscard, were considered also. Evidence as to the water-supply scheme was given by Mr. John Henry Crowther, engineer to the District Council. Several persons were heard in opposition, one opposing on behalf of a local water company. The application for a loan for the construction of a new street was then considered, evidence being given by Mr. H. W. Cook, the solicitor to the Wallasey District Council.

STAINED GLASS AND DECORATION.

HAMMERSMITH SYNAGOGUE.—The work of decorating the interior of the Hammersmith and West Kensington Synagogue has just been carried out in accordance with a scheme prepared by Mr. Percy L. Marks, architect, who has superintended the execution of the work. The walls generally are of a light green, separated by a suitable band from the dado, which is painted a warm brown. The strings, cornices, arches, &c., are finished cream colour and the soffits white. The panelled fronts to gallery are painted in dull green for the framing, with pink mouldings and cream panels. The woodwork of rostrum and ark is grained, &c., to imitate American walnut; and the columns, pilasters and their capitals, as well as the corbels are marbled in imitation of Rouge Royale, with Brescia bases and pedestals. The capitals and corbels are picked out in gold. Appropriate Hebrew verses in gold are written on the frieze over the arches of the nave and ark. The work has been executed by Messrs. Chamberlain Brothers, of Hammersmith, at an approximate cost of 150l.

FOREIGN.

FRANCE.—M. Marcel Lambert, the architect to the Château of Versailles, is carrying on, along with the restoration of the main building and the two Trianons, the repair of the fountain basins in the park. Those of the Trianon and the south parterres are already restored, and after the usual summer fêtes the repair of the large basins will be undertaken. A new Colonial Institute has been opened at Bordeaux. The Service des Bâtimens Civils, having restored the chapel of St. Germain-en-Laye, is now occupied with the repair of the upper stories of the façade of the Château, which are in a dangerous condition. The Municipal Council of Lous-le-Saunier has organised a competition limited to architects of the Departments of Ain, Doubs, Jura, and Haute-et-Loire, for the design of a new theatre for Lous-le-Saunier. Important works of repair are shortly to be commenced in the interior of the Madeleine at Paris, at an estimated cost of 330,000 fr.—A new Mairie has been inaugurated at Juvisy in the old chateau of the XVIIIth. century, which has been altered and laid out for the purpose, under the direction of M. Thauront, architect. The death is announced, at the age of 32, of M. Irenée, architect, of Courbevoie. On Monday last the five new rooms in the Louvre were opened, in which the finest examples of French furniture have been collected. One room is devoted to Louis XIV. furniture, one to Louis XV., and three to Louis XVI.—At Fontainebleau, a monument has just been erected to the memory of Rosa Bonheur. It is the work of her brother, M. Isidore Bonheur, and of his nephew, M. Peyrol, the sculptor.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Thos. Durrans, architect, of 71, Baker-street, London, has taken into partnership Mr. Herbert R. Groves, formerly his pupil and subsequently his assistant. The practice will be carried on under the style of "Durrans & Groves."—Messrs. Easton & Co., of Broad Sanctuary, London, have appointed Messrs. Doddrill Bros., of 11, Bothwell-street, Glasgow, as their agents for Scotland, for their Schmidt superheating steam system, electric lifts, and other specialties.

CARDIFF ELECTRIC LIGHTING.—The monthly report of the Cardiff Electrical Engineer (Mr. A. Ellis) shows that the total number of consumers is

401, and the equivalent consumption is 40,022 8-candle-power lamps. This shows an increase on the corresponding period of last year of 48 per cent. During the month 2,668 8-candle-power lamps were connected, and in the same period 72,570 Board of Trade units were generated, which shows an increase of 47 per cent. over the same month of last year. The calculated revenue is 1601 12s. 6d. from street lighting and 557l. 11s. 6d. from private supply, a total of 718l. 4s. This shows an increase of 39 per cent. over the calculated revenue of the same period of last year.

ARCHAEOLOGICAL DISCOVERIES AT DORCHESTER.—An addition to the recent discoveries of Roman remains at Dorchester, Dorset, has just been made. While some workmen were making excavations for a house in the road known as Icen Way, in the eastern suburbs of the town, they came upon a Roman floor more than 20ft. long and about 7 ft. wide.

RUSKIN MEMORIAL CROSS, CONISTON.—To mark the burial place of the late John Ruskin in Coniston Churchyard, a headstone has within the last few days been erected. The monument is a tall cross of the type lately revived from ancient pre-Norman models; the early English type having been adopted in the belief that Mr. Ruskin himself would have wished for some headstone of a quiet and unpretentious, and yet of an artistic and decorative, kind. The cross is of the hard green stone of Coniston, supplied from the quarries of Tiberthwaite, and is not liable to chip or lose its pleasant grey-green colour. It is slender and tall, standing some 9 ft. high, on the site facing the grave, and looking east, is a figure with a lyre, symbolical of Ruskin's earlier works—poems, and the "Poetry of Architecture." Above this, in a panel of interlaced work, is inscribed his name and the dates 1819-1900, the only lettering thought necessary. On the tablet is the figure of an artist sketching, with the pines and range of Mont Blanc indicated and the rising sun, which was the device on his first important work, "Modern Painters." Above is the lion of St. Mark, representing "Stones of Venice," and the candlestick of the Tabernacle for his "Seven Lamps." The south side is filled with clusters of his favourite wild rose, in bud, blossom, and fruit, and on the boughs are three of the creatures about which he wrote—the squirrel, the robin, and the kingfisher—all symbolical of his interest in nature. The west side, looking towards the mountains, represents Ruskin's ethical and social teaching. At the bottom is the parable of the workmen in the vineyard receiving each his penny from the Master—"Unto this Last." Then comes a design of "Sesame and Lilies," and in the middle "Fors Clavigera"—the Angel of Fate holding the club, key, and nail, which will be readily recognised. Over that is the "Crown of Wild Olive," and at the top "St. George and the Dragon." The north side is of a simple interlaced pattern. The cross-head on one side bears the Globe, symbolising in old sculptures the Sun of Righteousness, and the other side has a disc with the Yfylot or revolving cross as the emblem of eternal life. The monument has been designed by Mr. W. G. Collingwood, of Keswick, a relative of Ruskin.

A NEW ELECTRIC LAMP.—Mr. Hewitt, an American electrician, has invented a new electric lamp which, in the laboratory form at least, has an efficiency about ten times greater than that of the ordinary glow lamp. Models of the lamp were exhibited last month at Columbia University to the American Institution of Electrical Engineers and excited the greatest interest. The main principle is the incandescence of mercury vapour contained in a long glass vacuum tube. One terminal sealed in the tube dips into mercury, the other is connected to a piece of iron inside the tube. In the models exhibited the length of the tubes varied from 2 ft. to 4 ft., and their diameter was about 1 in. Their efficiency was exceedingly high, a tube, for example, $\frac{1}{2}$ in. in diameter and 3 ft. long, giving 400 c.p. with a consumption of energy the same as that required by four ordinary 8-c.p. glow-lamps. The light given out by the lamps is practically deficient in red rays, and very numerous attempts have been made to remedy this defect. In a patent for mercury lamps granted in this country last year to the General Electric Company of New York, there are no less than eighty-eight claims. In the specification the efficiency of these lamps is stated to be from three to five times greater than that of the carbon arc-lamp, but it is mentioned that the light is of an unsatisfactory colour. To remedy this defect various substances are introduced into the mercury. Iridium, lithium, sodium, and thallium are a few of the substances mentioned. It is admitted only in the experimental stage at present, but the results already obtained are very promising.

OPEN SPACES (METROPOLITAN).—The grounds, covering about 65 acres, attached to Dollis Hill house, which were opened to the public on Saturday last, have been secured at a cost of 50,000l., and under the name of "Gladstone Park" will be preserved without any curtailment of their natural beauties, as a memorial of the late W. F. Gladstone, who frequently stayed at the house as a guest of Lord Aberdeen when public duties required his residence in London. The estate is being surrounded by the rapidly extending residential localities of Neasden, Hendon, and Willesden. Contributions

towards the purchase moneys have been made by the Middlesex County Council (12,500l.), the London County Council (3,500l.), the Skinners' Company (50 guineas), and the Local Authorities of Hampstead (1,000l.), and Hendon (500l.). Sir William Rowley's Select Committee of the House of Commons have approved of the London County Council's Bill for acquiring the park as an open space—the house remains, for the present, in private occupation.—Some days ago the London County Council formally handed over to the people the Hughes Fields Recreation Ground, with its gymnasium, in the parish of St. Nicholas, Old Deptford, which consists of about three-fifths of an acre, with frontages to Trevithick-street and Butcher's-row, and is part of the surplus land of an insanitary area which had been cleared for the Hughes Fields improvement scheme. The ground is named after Admiral Hughes, who lived, it is believed, in an old adjacent house that fell into decay about fifty years ago.—The Parks Committee, L.C.C., have been authorised to expend a sum of 640l. upon the laying out of the open space of Albert-square, Commercial-road, E., which has been acquired for the sum of 10,500l. upon the award of Mr. J. H. Clutton, who adjudicated as arbitrator in the matter of the purchase from the claimant, who, in 1889, bought the property at Albert-square, comprising thirty-nine houses and the open square, for, it was stated, 22,000l., and preferred a claim of 17,702l. in respect of the vacant ground. With the aid of a further contribution out of the London Parochial Charities Fund the purchase of the 43 acres to be added to Brockwell Park is secured, the whole of the required sum—about 66,800l.—being now subscribed.

THE LONDON AND INDIA DOCKS COMPANY.—In terms of a Bill which the company have introduced this current session it is proposed to carry out an extension on the south side of the Albert Dock, for which plans were prepared by their late engineer-in-chief, Mr. Baggallay, at an estimated cost of from 1,500,000l. to 2,000,000l. The projected works include a new dock, one mile long from east to west and from 260 ft. (at the extreme west end) to 600 ft. (at the entrance) in width, with an entrance lock 750 ft. long, 80 ft. wide, and 38 ft. deep on the sills, and having three pairs of gates. The depth of the dock will range from 33 ft. to 39 ft., and the quays available for ships are to be 10,000 ft. long. At the west end is to be made a new graving dock, about 720 ft. in length, with a width of 86 ft. on the floor and 100 ft. at the quay level, and a depth of 30 ft. on the sills. A cut will be made for the passage into Albert Dock of vessels which are too long to go through the Albert locks, and to enable vessels in the Albert or Victoria Dock to use the proposed graving dock. During twenty years past the company have expended 3,700,000l. upon the enlargement and improvement of their docks and other works.

THE SOUTH-EASTERN AND CHATHAM RAILWAY.—Some extensive alterations are being made near Blackfriars Junction, in Southwark-street, as part of the company's scheme for a reorganisation of their *grande vitesse* parcels service, together with its transfer from London Bridge, and the opening there of additional accommodation for passenger traffic. The new goods station is designed as a terminus for the delivery of Continental parcels, including crates of pigeons from Italy, millinery from Paris and Lyons, and fruit and vegetables from France, Italy, and Spain, which hitherto have been received at the low-level station, London Bridge—the original terminus of the South-Eastern line—which will shortly be rebuilt. It is 600 ft. long with four sets of rails, and has two platforms at the sides of a cart-road, with space for the unloading at one time of sixty railway trucks and standing-room for eighty trucks besides. An incline from George-street carries the road into the station, which is about 45 ft. above the level of the street. The buildings comprise a warehouse with hydraulic lift and storage arches, and offices in Gravel-lane where a large room on the ground floor forms a waiting-room and shelter for the labourers.

ELECTRICAL LIGHTING IN KENSINGTON.—The Kensington Borough Council have now decided to supply electric light in the main thoroughfares, as follows:—Kensington High-street, Brompton-road, Holland Park-avenue, and High-street, Notting Hill. Arc lamps are to be adopted, and the cost is estimated at 3,000l.

YORKSHIRE BUILDING TRADES FEDERATION.—The Yorkshire Federation of Building Trades Employers held its monthly meeting at the Westminster Hotel, Sheffield, on the 24th ult. Mr. J. Langdon, Sheffield, presiding. Representatives were present from Sheffield, Halifax, Bradford, Hull, Scarborough, Selby, Bridlington, Keighley, Spen Valley, Leeds, and Malton. The principal business was the appointment of a secretary to fill the vacancy occasioned by the death of Mr. Sutcliffe Hanson, of Halifax. There were four applicants for the office, and Mr. G. Stanley, Secretary to the Hull Branch, was unanimously elected.

PARK FOR LEVESHAM.—On the 27th ult. Mr. A. M. Torrance, J.P., chairman of the London County Council, opened the new Sydenham Wells Park, which has been secured to the public by the London County Council. The park, which is close to the Crystal Palace, is 17 $\frac{1}{2}$ acres in extent, has

frontages to Wells-road, Longton-avenue, and Taylor's-lane, and has cost 7,000*l.*, with 5,000*l.* for laying-out. Tennis-courts and a quoll-pitch have been provided, and it is intended to form a bowling-green. The land as acquired was very undulating in form, being practically a basin formed by the conjunction of two valleys. Advantage has been taken of the natural undulations and the existing watercourses, and the ground as now laid out presents a series of slopes, intersected by broad foot-paths and ornamented by plantations and a succession of small lakes and rivulets.

SILCHESTER EXCAVATION FUND.—The antiquities found at Silchester during the past year will be exhibited at the Society of Antiquaries' rooms from the 3rd to the 15th inst. The year's work carried out at Silchester was begun early in May, 1900, and continued, with the usual break during the harvest, until December 4. The excavations were confined to the large area, containing in all eight acres, situated between Insula XII. (excavated in 1894) and Insula XXII. (excavated in 1899), and extending up to the north gate and town wall. The area in question contains four insulae, which have been numbered XXIII. to XXVI. Insula XXIII. formed the northernmost of a series of unusually large squares occupying the central portion of the town. A fair-sized house at the south-west corner was uncovered by the late Rev. J. G. Joyce in 1865; the recent excavations have revealed an additional series of chambers on the north-east. Another house of large size with several mosaic pavements was also uncovered on the east side of the insula, and in the mouth of its courtyard was a small square building which may have been devoted to sacred purposes. This had been built up round a small and earlier structure of the same character. The other traces of buildings in this insula, despite its size, were singularly scanty, but the rubbish pits and wells were unusually productive in objects of interest. In pottery these yielded upwards of a hundred whole vessels of all kinds and sizes, and from one of the wells was recovered another great hoard of iron tools, mostly a smith's, similar to that found in 1899 in Insula I., but considerably larger numerically. Insula XXIV. forms a long and narrow triangular strip, bounded on the north by the town wall and its bank. Such strips have hitherto proved more or less empty of buildings, but in this case it contained two houses, one of which was of large size and of exceptional interest from the peculiarity of its plan and the number of mosaic floors in it. Insula XXVI. had in it two houses, a small one on the west, and another in the south-east quarter which was partially uncovered by Mr. Joyce in 1866. Its complete plan has now been revealed. There are also traces of a ruined house near the south-west angle. Besides the houses, Insula XXVI. contained traces of at least three other structures. One of them was represented by a solid circular platform with a cement floor 27 ft. in diameter, enclosed apparently by woodwork or half-timbering. The coins found were as numerous as usual, but not very important.

BERLIN FIRE CONGRESS.—In acceptance of an invitation from the German Government to attend an International Fire Congress, to be held at Berlin next week in connexion with the Fire Exhibition which was opened on Saturday, the British Fire Prevention Committee will be represented by a deputation comprising Mr. Edwin O. Sachs, chairman; Mr. Max Clarke, A.R.I.B.A.; Mr. F. R. Farrow, F.R.I.B.A.; Mr. F. Hammond, F.R.I.B.A., District Surveyor, Hampstead; and Mr. Ellis Marsland, District Surveyor, Camberwell. The deputation will take the opportunity to examine the general arrangements as to the working of the Building Law at Berlin, as well as the influence of the new theatre, factory, and workshop regulations upon modern structures in that capital; and they will, on their return journey, visit Hamburg, with a view to studying the general fire protective arrangements of the port and the more recent forms of warehouse construction which have been adopted in that city. The observations of the deputation, both at Berlin and at Hamburg, at the Exhibition, and in attendance at the lectures of the Fire Congress, will be embodied in a report, each member of the deputation taking up a special chapter dealing with that part of the subject with which he is particularly conversant. The report will be published in due course.

THE INSTITUTE OF SANITARY ENGINEERS (INCORPORATED).—This Institute has taken new offices at No. 19, Bloomsbury-square, W.C.

CAPITAL AND LABOUR.

THE DISPUTES IN THE LEICESTER BUILDING TRADE.—On the 21st ult. Sir William Markby attended at the Town Hall, Leicester, for the purpose of officiating as arbitrator in the dispute which recently occurred at the new Wholesale Market between the bricklayers' labourers and their employers on a question relating to concrete. Sir William heard evidence on both sides, and intimated that he would give his decision in the matter in the course of a few days. Subsequently, upon the suggestion of Councillor T. Smith, the local representative of the Board of Trade, Sir William Markby accepted the position of friendly conciliator in the matter of the dispute

between the Leicester stonemasons and their employers, arising out of the men's demand for an advance of wages and other concessions. Statements representing both sides of the case were placed before him, and it is understood that he will make a recommendation upon the basis of which the dispute may be amicably settled.

PERTH MASONS AND THEIR WAGES.—The operative masons have agreed to accept the terms offered by the masters. Some time ago the employers intimated that they would reduce the men's wages by a $\frac{1}{4}$ d. per hour after the beginning of June. At first there was a strong feeling among the men that they should fight the matter, but after considering the present dulness in the trade, the men have agreed to accept the terms. The agreement commences in June and lasts for a year.

STRIKE IN THE BUILDING TRADE AT NEWARK.—There is no indication at present of a settlement of the dispute in the building trade at Newark which commenced on May 1. Six months' notice prior to this date had been given to the employers for an advance in wages by the operative bricklayers and labourers. Some 200 men were affected. Nearly the whole of these men came out on strike. Negotiations were at once opened with the employers, and as far as the bricklayers were concerned, a settlement was soon arrived at by the bricklayers withdrawing their demands for an increase of $\frac{1}{4}$ d. per hour, and the employers agreeing to sign a code of working rules for the district. With regard to the builders' labourers this section insisted upon an advance in wages of $\frac{1}{4}$ d. per hour, viz. from 5d. to 5 $\frac{1}{4}$ d. per hour, the employers agreeing to a code of working rules for the district. A meeting between representatives of both sides failed to arrive at a settlement, and the strike has been carried on with vigour and determination by both sides. The bricklayers are reported as working with non-society labour, where it has been introduced, although some fifty are unemployed owing to the labourers continuing the strike. Three firms are working, having conceded an advance of $\frac{1}{4}$ d. per hour to the labourers; two others are reported as partially employed. Most of the firms are, however, standing.—*Nottingham Guardian.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

1,754.—A CIRCULAR-SAW GUARD: *J. Ingleson.*—The guard consists of two shields pivoted to the end of a plate of which the required height may be adjusted in a bracket, that is secured to the ceiling by means of a counter-weight upon a chain and a clamping screw. Slotted arcs serve for adjustment of the shields at any angle desired, on the forward end of one counter-balanced shield is mounted a roller, and the riving-knife is carried upon an adjustable slide.

1,775.—A CONTRIVANCE FOR SURVEYORS' INSTRUMENTS, &c.: *J. E. Ramsay.*—Between glass plates is pivoted a pendulum-bob, having forked pointers that travel over scales marked upon both sides of the ring, means are provided for securing a spring in position, when the instrument is not being used the released spring is caused to enter a recess in the bob, and so keeps the bob from swinging.

1,776.—ROOFING-TILES: *F. Nölker.*—To obviate leakage of water and the lifting of the tiles by the wind, they are fashioned with singly or doubly rebated, wavy or splayed and interlocking sides, and with upper and lower serrated interlocking undercut ribs; strengthening ribs are made on their under sides, their lower edges are rounded or bevelled, and upper wedge-shaped recesses in them interlock with undercut projections under the side edges of the tiles above. For preventing water from trickling down the end walls diagonal ribs are made upon the outside of half tiles to be used for the gable ends of a roof.

1,802.—CONSTRUCTION OF CEILINGS AND FLOORS: *W. F. Chanl.*—For a temporary centering, boards are laid across wooden ribs nailed to metal plates that are supported upon the lower flanges of the joists, the ceiling being built up with plaster sheets cast about centres of woven wire, and fastened on to iron bars that rest upon the lower flanges of the joists, and the under surface being plastered.

1,828.—CRANES: *R. Williamson.*—The engine and lifting gear are carried upon one end of an arm which, together with the load, they will thereby balance. The arm or jib, constructed of two I-section girders, turns around upon the top of a travelling frame. In operation the load is lifted when the carriage is close in; then the arm is turned and a Y-prop (or, in the case of a railway, a truck upon parallel rails) is put beneath the outer end of the arm when the carriage can be run out for the lowering of the load.

1,915.—ASPHALT PAVEMENT: *C. A. C. Caudenberg.*—Asphalt, 100 kilos, finely powdered is mixed with a solution of from 75 to 100 grammes of India-rubber and 5 litres of petroleum, benzine, or some similar spirit.

1,931.—POTTERY WARES: *H. Werner.*—For a material that is described as possessing a low specific gravity with great strength, and as being a

bad conductor of sound, heat, and electricity, an admixture is made of from 5 to 45 per cent. of crushed basalt and a refractory earth, to which crushed quartz may be added. The basalt is intended to give a glazed surface to the goods when fired.

1,996 and 1,998.—MEANS OF STOPPING LEAKS IN PIPE JOINTS: *S. R. Dresser.*—For gas and other pipes, and more particularly for spigot-and-socket joints, is devised a clamp-ring made in two parts and having stepped ends together with apertures for the bolts, which have polygonal heads and side projections for engagement with the joint-socket, and are retained in their places with flanges or washers. The packing ring fits into an annular groove or recess. (1,998) In the case of a screwed union, the packing ring will fit into annular recesses cut in the clamping rings, each of which consists of two portions that overlap one another and will temporarily engage by means of their apertures and projecting flugs, whilst retaining lugs prevent the turning of the bolts when they are screwed up; the contrivance is available also for leaded pipe joints.

1,997 and 1,999.—PIPE JOINTS AND EXPANSION JOINTS: *S. R. Dresser.*—An expansion joint for plain-ended pipes is made in two sections that when they are screwed up will compress together the ring, of which the ends are shaped as wedges, and the elastic packing. The other invention (1,999) relates to a stuffing-box joint or detachable coupling available for elbows, tees, sleeves, cocks, and valves, and so on, of pipes that are connected with a bell and socket that contain packing; a flange and a wedged extension are fashioned upon the pipe, and the joint, which allows for expansion, is formed by the compression of a covering follower upon the packing when the screwing up is completed.

2,021.—SPIGOT-AND-SOCKET JOINTS FOR CLOSET PIPES: *H. Hurry.*—A connexion between the soil-pipe and the closet outlet consists of a metal tube or collar that is fitted upon the outlet by means of a packing ring, the soil-pipe being inserted into its other end, and an inner tube packs the elastic packing. The packing-ring may be clamped between a clamping-ring and the upper portion of the collar, or a ring can be fitted over the packing-ring between the collar and the outlet pipe, at the end of which is a boss or flange; union or junction pieces may be made in this shape of two or more similar joints formed in pieces.

2,046.—A METHOD OF GLAZING WINDOWS: *E. Glauehl.*—Wrought-iron bars T-shaped in cross-section, constitute the sash-bars and rails or stiles. At the point where one bar crosses another it is cut out and fitted with a flange, being turned back so that the other bar shall be passed through the opening or slot; recesses in the inner flanges of the side-bars take the cross-bars, and the latter are fastened with counter-sunk rivets.

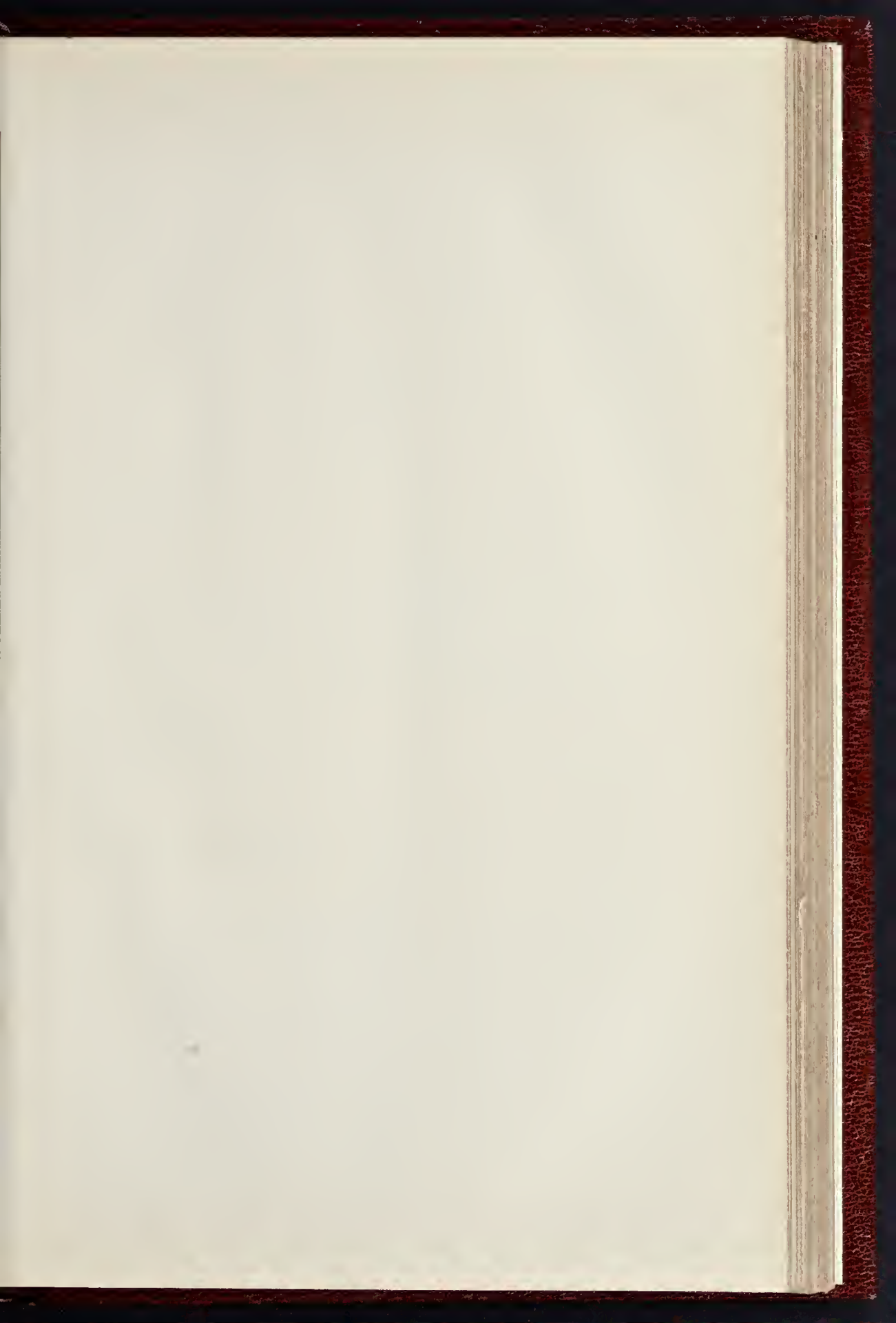
2,071.—A SAFETY APPARATUS FOR LIFTS: *J. W. Holmes.*—At the top of the well is a cross-beam resting upon springs, which under normal conditions remain compressed; on the beam is a pulley over which the lifting-rope is passed; on the guide-posts are a number of pawls, from which rods are hung; if the rope breaks the springs will tend to raise the beam, and the pawls will thereupon be tilted forwards into engagement with rack-plates upon the cage, so as to arrest its fall.

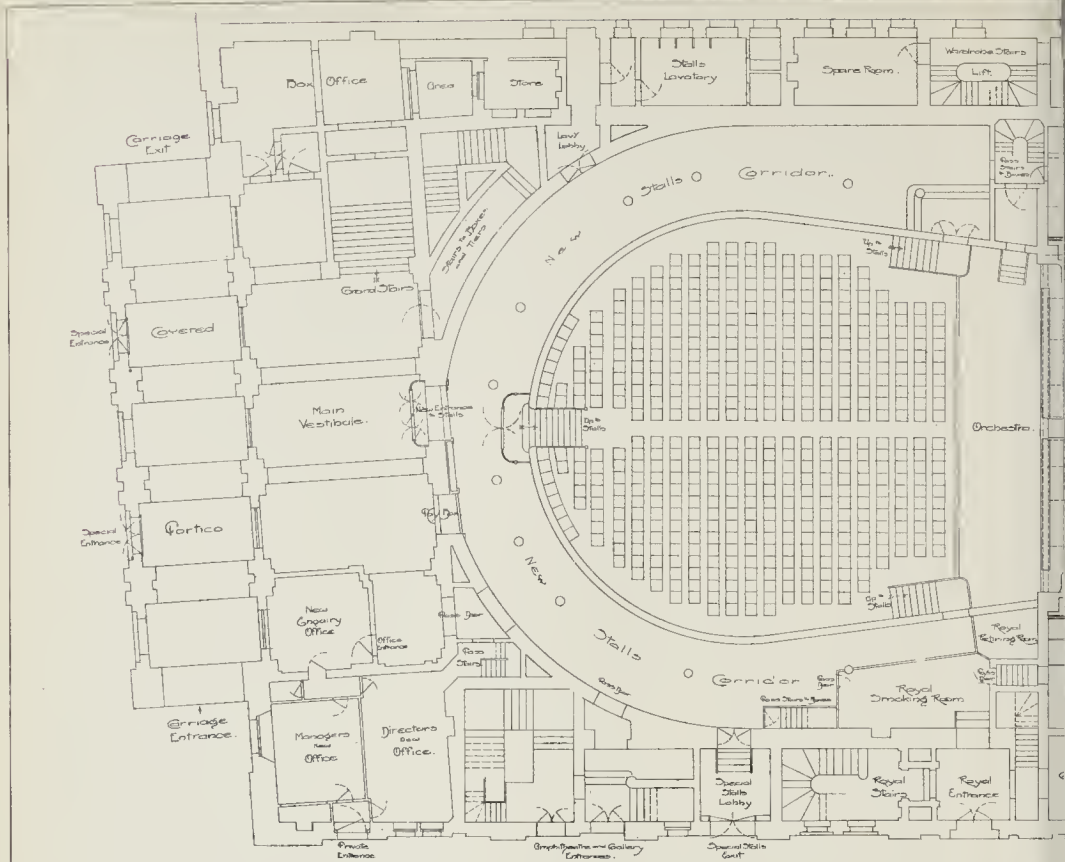
2,074.—ATTACHMENT OF TUBES AND PIPES: *F. W. Barthels and W. Schaefer.*—For facilitating the attachment of the tube to its flange before the operation of brazing the flange is chamfered and is fitted with a collar of which the groove is pierced in several places in the direction of the tube for taking the brazing-material which, when heated, will melt and make the joint without fusing the tube.

2,094.—MEANS OF DETECTING THE PRESENCE OF EXPLOSIVE GAS: *G. A. Lyucher and M. L. F. Mohr.*—The inventors seek to provide for discovering the presence of fire-damp, coal-gas, hydrogen, &c., in mines, gasworks, and so on, by an apparatus which shows an increase of pressure which arises from diffusion into a porous vessel and is exerted upon a flexible diaphragm, whereby an electrical alarm circuit becomes completed; the diaphragm is held in a ring with washers and a ring connected to one binding-post, the former ring holding the porous vessel and its shield. A screw adjusts the contact-point which is connected to the other binding-post; a cover encloses the parts thus described, and the pressure both within and without is equalised with valves. Eyes suspend the apparatus upon the shield, and a set of them can be connected to a central station.

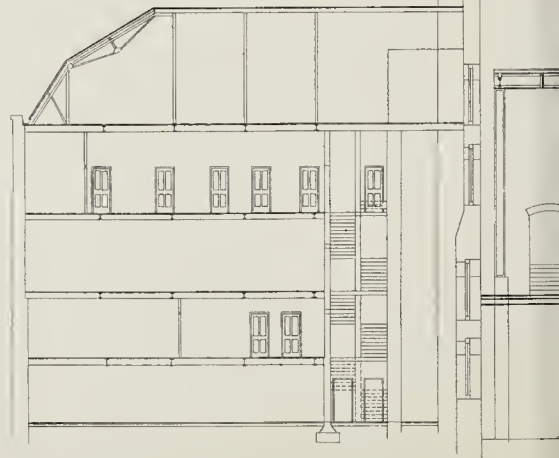
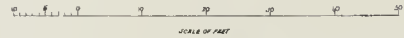
2,103.—FASTENINGS FOR WINDOW-SASHES; ALSO AVAILABLE FOR GATES, DOORS, AND SHUTTERS: *T. Harrison.*—A pin upon a bracket, which is mounted upon the upper sash, engages with a slot cut in the blade spring of a spring-catch carried by a support upon the lower sash, the beveling of the upper portion of the bracket causes the spring to be forced aside with the closing of the sashes and ensures the automatic engagement of the pin, pressure upon a knurled ring will disengage the spring for release of the fastening; in a modification two pins and springs are used.

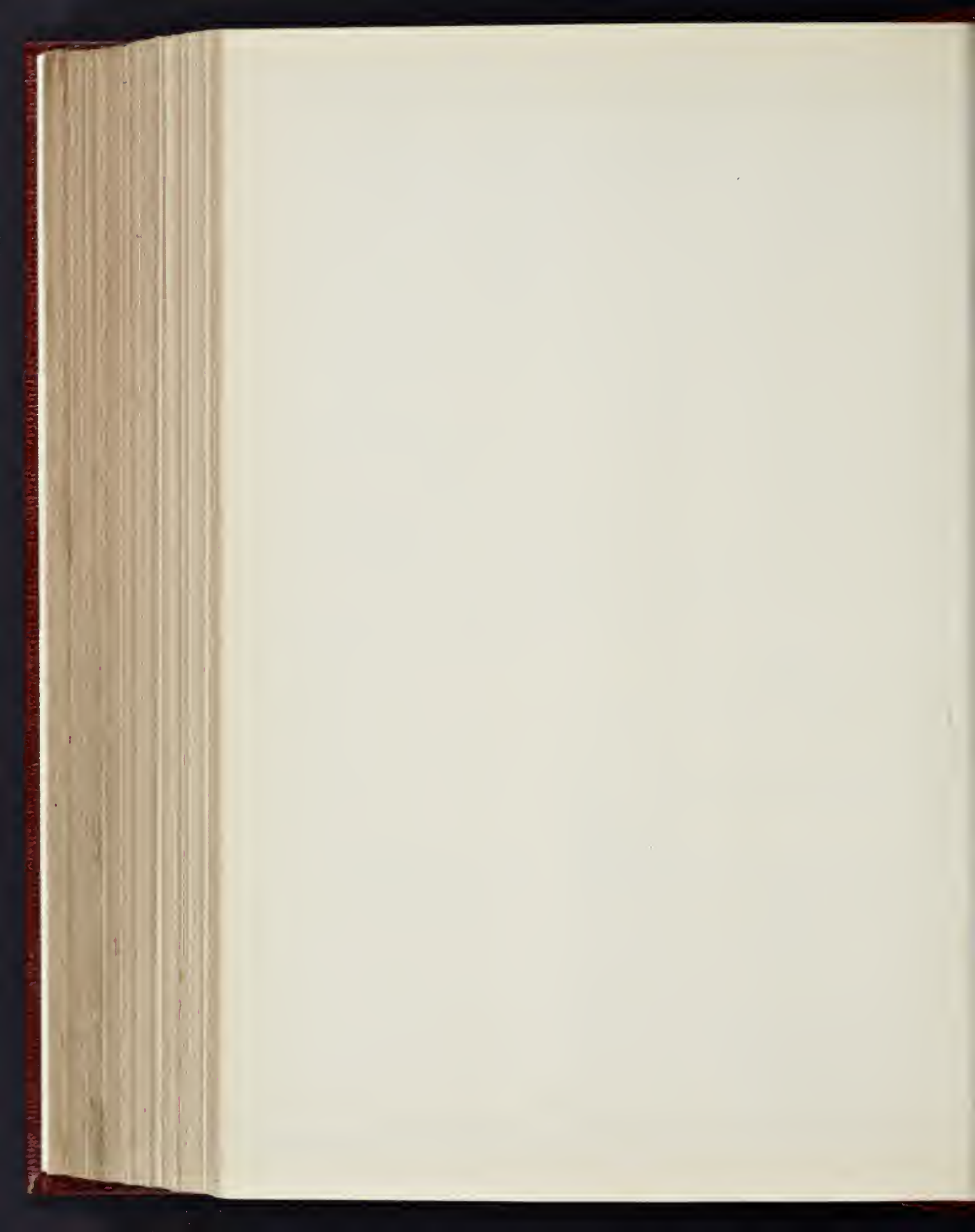
2,112.—A CONTRIVANCE FOR USE WITH WINDOWS: *R. R. Thom and S. McCall.*—In the frame are grooves and holes that take pivots at the lower corners of the sashes and on the top rails are eccentric cleats or holders through which are passed side





Scale to Section.





chains or cordstbat are attached to the window head and sill, and are to be freed by pressure upon knobs of the eccentricity to admit of the sash being opened or closed, the eccentric can be made to press the cord against a pulley by means of a spring, and pivots can be arranged to slide in metal guide-grooves in substitution for the grooves formed in the frame.

2,110.—JUNCTION-BOXES FOR ELECTRICAL CONDUCTORS: L. M. Waterhouse and Simplex Steel Conduit Company.—A box for conductors that are laid within tubes has main branch nipples together with insulators for the connecting pieces, separating bridge being made in one piece with the insulators, for sweated connexions with the mains the ends of the connecting-pieces, which are made in two parts, are drilled, and for the branches are arranged transverse holes with pinching-screws.

2,120.—ELECTRICAL SWITCHES: L. M. Waterhouse and Simplex Steel Conduit Company.—The inventors device a coupling-contrivance so as to constitute a double-pole switch, by the coupling of two ordinary tumbler switches; the counter-sunk holes of two bars take the spherical heads of the switch handles, and thus make ball-and-socket joints, a distance-piece at the middle keeps the bars apart whilst they are connected by means of screws that provide for an adjustment of the joint.

2,125.—EXTENSION LADDERS: W. Crouson.—The two sections of the ladder are extended with a cord around pulleys and booked, weighted, and cranked levers or catches, which are pivoted on to the upper section, maintain the two sections in their relative places; one end of the cord is secured to a lever, which is pivoted to the upper section as well as to the weighted cranked end of the lever or catch; its other end is fastened to the foot of the upper section; the hooks which fit over the rounds of the lower section are to be turned downwards on the action of a pull upon the lever-end of the cord; to the lower section are attached angular guide-plates, between which the upper section will slide, and upon the upper section are rollers which press against guide-plates upon the lower section.

2,148.—AN APPLIANCE FOR USE WITH THE SCOOFS OR CUPS OF ELEVATORS: H. A. Schmidt.—To obviate any spilling over between an elevator and the scoops the latter are fashioned with continuations turned out at the ends of their front walls. The upper edges of the back wall being turned outwards as well, each back wall has a rounded bottom that lies close against its corresponding wall, is attached to the belt, and is formed continuously with the sides of the scoop.

MEETINGS.

FRIDAY, MAY 31.

Architectural Association.—Annual dinner, Criterion Restaurant, Piccadilly-circus, 7.30 p.m.
Surveyors' Institution.—Country meeting at Southampton (concluded).

SATURDAY, JUNE 1.

Association of Municipal and County Engineers.—Home District meeting, Chichester. Mr. J. Saunders on "St. Paul's Church in Chichester."
St. Paul's Ecclesiastical Society.—Visit to the Parish Church of Enfield. Train leaves Liverpool-street at 8.30 p.m.
Builders' Foremen's Association (Memorial Hall, Farringdon-street).—7.30 p.m.
Devon and Exeter Architectural Society.—Annual meeting at Plymouth.
British Architectural Association.—Visit to Balmoro and Abernethy.

MONDAY, JUNE 3.

Royal Institute of British Architects.—Fourteenth General Meeting (business). (1) To receive the report of the scrutineers appointed by the annual general meeting to direct the election of the Council, Standing Committees, &c., for the year of office 1900-1; (2) election of candidates for membership. 8 p.m.
Surveyors' Institution.—Annual general meeting, 3 p.m.
Society of Engineers.—Mr. A. Taylor Allen on "Concrete Subways for Underground Pipes." 7.30 p.m.

WEDNESDAY, JUNE 5.

Royal Architectural Institute.—(1) Professor W. Boyce Dawkins, F.R.S., F.S.A., on "The Expedition of a Sepulchral Cave at Gop, near Prestatyn, Flintshire." (2) Mr. E. W. Brabrook, C.B., F.S.A., on "Medieval Lavatories." 4 p.m.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
Society of Biblical Archaeology.—(1) Prof. A. H. Sayce (President) will give a short address on "Recent Discoveries in the East." (2) Prof. Dr. Wiedemann on "Bronze Castles and Purification Vessels in Egyptian Temples." 4.30 p.m.
Edinburgh Architectural Association.—Address by Professor Baldwin Brown on "Durham, Hexham, and Chestery illustrated by lantern transparencies." 8 p.m.
British Archaeological Association.—(1) "Some Aspects of the Life and Times of Alfred the Great." By Dr. W. de Gray Birch, F.S.A. (2) "The Tribunal Prætoris at Rome." By Dr. Russell Forbes. 8 p.m.

THURSDAY, JUNE 6.

Society for the Encouragement of the Fine Arts.—The second convention, at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

SATURDAY, JUNE 8.

British Institute of Certified Carpenters.—Visit to King's Cross, 3 p.m.
Northern Architectural Association.—Visit to Hexham.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 14.—By T. LAVINGTON (at Devizes).
Devizes, Wills.—6, 7, and 8, New Park-st., f. ... £395
95 to 98, New Park-st., f. ... 600
4, Southbrook-rd., f. ... 400
May 15.—By WORSFOLD & HAYWARD (at Sandwich).
Stonar, Kent.—The Stonar Marshes, 69 a. 3 r. 19 p. f. ... 1,825
May 15.—By MESSRS. KENSLEY (at Romford).
Romford, Essex.—Hainault-rd., a block of building land, f. ... 202
Rowlands-rd., a block of building land, f. ... 120
Collier Row-lane, a block of building land, 7 a. 1 r. 24 p. f. ... 1,420
61 and 63, Eastern-rd., f. ... 870
By BAXTER, FAYNE, & LEPPER (at Bromley).
Bromley, Kent.—3 to 9 (odd), Florence-villas, u.t. 66 yrs., g.r. 24½, i.g.r. 12½ ... 970
5, The Vale, f. ... 280
By C. H. BROODEN (at Marple).
Marple, Cheshire.—Cross-lane, New Tree Cottage, f. ... 395
Cross-lane, a first freehold yearly rent of 9s. 10s. 4d. ... 239
May 17.—By VEEROM & SON (at High Wycombe).
Hedlow Ridge, Bucks.—Druces Farm, 64 a. 1 r. 17 p. f. ... 800
Stokenchurch, Bucks.—Freehold building land, 2 a. 1 r. 35 p. f. ... 235
Four freehold cottages and o. a. 1 r. 25 p. ... 50
Freehold residence, two cottages, and o. a. 1 r. 7 p. ... 450
Radnax, Bucks.—Eight cottages and land, 3 a. 3 r. 4 p. f. ... 430
Istone Common, Bucks.—Two freehold cottages
Loudwater, Bucks.—Residence and three cottages, 6 a. f. ... 775
A moiety of King's Paper Mill, No. 47, area 1 a. 2 r. 27 p. f. ... 2,450
High Wycombe, Bucks.—3, Creden-st., f. r. 204. ... 530
May 18.—By STEPHENSON & ALEXANDER (at Cardiff).
St. Andrew's Major, Glamorgan.—Coldbrook Estate, 98 a. 1 r. 21 p. f. (in lots) ... 5,850
By MESSRS. SPELMAN (at Norwich).
Great Plumstead, Norfolk.—The Red House and 2 a. 1 r. 9 p. f. ... 3,300
Cottage and enclosure, 12 a. 2 r. 18 p. f. ... 700
May 20.—By BAKER & SONS, 2 a. 3 r. 3 p. f. ... 1,035
Camden Town.—30 and 82, Camden-rd., u.t. 38 yrs., g.r. 10½, r. 97½ ... 745
Woodford.—Cleveland-rd., Norfolk Villa, f. ... 1,040
By H. J. BROWN.
Forest Hill.—4, Church-rd., u.t. 62½ yrs., g.r. 10½ Brixton.—36, Laneross-rd., u.t. 89 yrs., g.r. 9½ Sydenham.—82 to 90 (even), Sydenham-rd., f. r. 180. ... 3,280
By J. P. DICKINSON.
Hampstead.—5 and 25, Hillfield-rd., u.t. 73 yrs., g.r. 16½, r. 100½ ... 1,065
By ELLIOTT, SON, & BOYTON.
Marylebone.—21, Devon-st. and studio in rear, u.t. 21 yrs., g.r. 45½ ... 990
By NORMAN & SON.
Leytonstone.—110, Woodhouse-rd., f. r. 32½ ... 420
107, 111, and 113, Harrow-rd., f. r. 94 ... 1,300
East Ham.—15 to 21 (odd), Kelly-rd., u.t. 77 yrs., g.r. 12½, 125 ... 345
Forest Hill.—12 (even), Arthur-rd., u.t. 77 yrs., g.r. 21½, 188. ... 420
By C. F. RUTLEY.
Bloomersbury.—12 and 15, Gower-mews, u.t. 35 yrs., g.r. 24½ ... 820
Brighton, Sussex.—20, Sussex-square, f. ... 1,500
Caterham, Surrey.—Main-rd., Stanstead and 8 a. 1 r. 15 p. f. ... 1,625
Main-rd., a block of building land, 2 a. 2 r. 9 p. f. ... 1,025
Upper Camerton, Surrey.—White Caterham, Surrey side and 2 a. 1 r. 6 p. f. r. 168½ ... 2,800
Essendene-rd., a plot of building land, o. a. 2 r. 37 p. f. ... 140
Highest, a plot of building land, f. ... 200
Whyteleafe, Surrey.—Croydon-rd., two plots of land, with erection thereon, f. ... 115
By R. TIDY & SON.
De Beauvoir Town.—6, Balme-st., u.t. 25 yrs., g.r. 4½, 108, & g.r. 34½ ... 330
Clapton.—84 and 86, Pedro-st., u.t. 78 yrs., g.r. 10½ ... 255
209 and 204, Glynd-rd., u.t. 76 yrs., g.r. 10½ ... 380
Caledonian-road.—24, Bryan-st., with sheds in rear, u.t. 43 yrs., g.r. 5½, r. 65½ ... 320
Hoxton.—14, Penn-st., u.t. 36 yrs., g.r. 5½ ... 220
Leytonstone.—Birkbeck-rd., two building plots, f. ... 1,850
By A. H. TURNER & CO.
Lurgashall, Sussex.—Little Brockhurst Farm, 45 a. 1 r. 21 p. f. ... 900
Lodsworth, Sussex.—Shotters and 45 a. 2 r. 34 p. f. ... 1,850
By WEATHERALL & GREEN.
Kentish Town.—53, Bartholomew-rd., u.t. 57½ yrs., g.r. 11½, r. 65½ ... 720
Notting Hill.—14, 16, 18, and 20, Elychryden-st., f.; also i.g.r. 7½, u.t. 71 yrs. ... 1,820
Bonchurch-rd., i.g.r. 9½, reversion in 70½ yrs. ... 243
By WALFORD & WILSHIN.
Norwood.—4, High-st., f. r. 62½ ... 1,250
Anerley.—220, Anerley-rd., f. r. 100½ ... 1,450
Versailles-rd., i.g.r. 5½, 304 yrs., u.t. 44 yrs., g.r. 11½, 128. ... 275
Madingley, i.g.r. and rent charge of 457 6s. 6d., u.t. 73 yrs., g.r. 25½ ... 470
May 21.—By FLEURET, SONS, & ADAMS.
Oxford-st.—No. 183, The Crown, f. also No. 442, The Union (Fowncybe's), u.t. 21 yrs., g.r. 12½, 128. ... 60,000
Strand.—No. 93 (Lawrence's), u.t. 22 yrs., r. 268½, with goodwill. ... 2,000
By W. HALLETT & CO.
Putney.—Veilmer-st., a range of stabling, u.t. 65½ yrs., g.r. 11½ ... 1,500
By HUNTER & HUNTER.
Regent's Park.—161, Albany-st., u.t. 14 yrs., g.r. 15½, 158. ... 210

By WALTON & LEE.
Mayfair.—63, Curzon-st., u.t. 820 yrs., g.r. 17, 108, r. 300. ... £7,500
By DEEBHAM, TEWSON, & CO.
Haggerston.—Dunston-rd., &c., i.g.r. 5½, 108, reversion in 18 yrs. ... 4,825
Dunston-rd., &c., i.g.r. 5½, 108, reversion in 18 yrs. ... 9,400
Haggerston-rd., &c., i.g.r. 5½, 177½, reversion in 18 yrs. ... 7,600
Dunston-st., &c., i.g.r. 5½, 185½, reversion in 18 yrs. ... 11,600
Dunston-rd., &c., i.g.r. 5½, 164½, reversion in 18 yrs. ... 3,100
Clarissa-st., &c., i.g.r. 5½, 25½, reversion in 18 yrs. ... 2,125
33, Lee-st., r. 42½, also i.g.r. 5½, 59½, reversion in 18 yrs. ... 3,400
Lee-st., The Earl of Zeland p-h., &c., i.g.r. 30½, reversion in 18 yrs. ... 6,100
Dunston-st., The Two Beehives p-h., i.g.r. 22½, 108, reversion in 18 yrs. ... 3,000
Clarissa-st., The Prince Ernest p-h., i.g.r. 29½, reversion in 18 yrs. ... 2,320
Chiswell, Essex.—Taylor and 55 a. 0 r. 27 p. f., South Kensington.—23, Earl's Court-st., u.t. 73½ yrs., g.r. 18½ ... 2,000
City of London.—20 and 21, Harp-lane, area 2,208 ft., building lease for 80 yrs., let at per annum ... 300
77, Knightrider-st., area 800 ft., building lease for 80 yrs., let at per annum ... 190
By CHANCELLOR & SONS.
Frimley, Surrey.—The Priory and 2 acres; also 1, 2 and 3, Priory Cottages, f. ... 3,500
Wokingham, Berks.—Wiltshire Farm, 2 acres, f. r. 704 ... 1,560
Hampton-on-Thames, Middlesex.—High-st., Finthorpe, and 1 acre, f. r. 65½ ... 1,200
High-st., The Cottage, f. r. 304 ... 520
By SALTER, REX & CO.
Kentish Town.—36, Lady Margaret-rd., u.t. 67 yrs., g.r. 10½, r. 604 ... 610
Regent's Park.—13, Little Edward-st., u.t. 22 yrs., g.r. 4½ ... 115
Dalston.—57 to 63 (odd), Malvern-rd., u.t. 41 and 43 yrs., g.r. 21½, 58 ... 1,335
By DYER, SON, & HILTON (at Blackheath).
Lee.—2 and 6, Upwood-rd., u.t. 65 yrs., g.r. 7½, r. 984 ... 950
18, 20, and 22, Rowers-rd., u.t. 77 yrs., g.r. 12½ By WILLIAM ROBEY (at Masons' Hall Tavern).
Pimlico.—Victoria-st., The Duke of York p-h., u.t. 17½ yrs., r. 2004; also the York Restaurant, u.t. 21 yrs., r. 1904, with goodwill. ... 22,000
Victoria-st., The Duke of York p-h., and the York Restaurant, i.g.r. 26½, u.t. 21 yrs., g.r. 11½ ... 910
By T. ALBENSON & SON (at Masons' Hall Tavern).
Somerset-Place, Berks.—The White Hart Hotel, u.t. 47 yrs., r. 175½, with goodwill ... 3,750
May 22.—By DYER, SON, & HILTON.
Lee.—243, Lee High-rd., u.t. 72 yrs., g.r. 2½, r. 704 ... 385
Wimbledon.—11, Effra-rd., f. ... 100
By MARK LIEBL & SON.
Plaistow.—20 to 34 (even), Milton-rd., f. ... 905
36 to 44 (even), Milton-rd., and 24, 26, and 28, Charlton-rd., f. ... 880
Hackney.—33 and 35, Glaskin-rd., u.t. 54½ yrs., g.r. 8½, r. 367 ... 645
Stratford.—6 and 8, Warwick-rd., u.t. 78 yrs., g.r. 11½ ... 410
By E. W. RICHARDSON & SON.
Enfield.—Green-st., Beaumont House, f. ... 480
Plaistow.—Stock-st., i.g.r. 7½, reversion in 85 yrs. ... 155
Chesterton-rd., a plot of building land, f. ... 130
By ROBINS & HINE.
Streatham.—13 and 17, Northanger-rd., u.t. 72½ yrs., g.r. 12½, r. 84 ... 1,030
By RUSHWORTH & STEVENS.
Bloomersbury.—9, Vernon-pl., u.t. 35 yrs., g.r. 30½, r. 904 ... 1,080
Camden Town.—15, Cantlewes-rd., u.t. 49 yrs., g.r. 7½ ... 465
By SINCLAIR & SON.
Canonbury.—2, Cleburne-rd., u.t. 44½ yrs., g.r. 6½, r. 158½, r. 304 ... 800
Hackett.—16, Willow-rd., f. ... 275
Hackney.—Belmont-rd., Vine Lodge, f. r. 304 ... 400
Wimbledon.—93, Kingston-rd., u.t. 77 yrs., g.r. 5½, r. 391 ... 300
By E. TOMPKINS & SON.
Hyde Park.—6, Chester-pl., u.t. 34½ yrs., g.r. 6½, r. 250½ ... 1,700
By WRIGHT & CO.
St. John's Wood.—61, Carlton-hill, u.t. 48½ yrs., g.r. 17½, r. 1004 ... 850
By DOUGLAS YOUNG & CO.
Wimbledon.—38, Cromwell-rd., u.t. 87½ yrs., g.r. 6½, 108, r. 34½ ... 345
Peckham.—72, 74, and 76, Scyllard-rd., f. ... 290
Norwood.—9, Whiteley-rd., u.t. 65 yrs., g.r. 6½, r. 304 ... 290
Clapham.—41, Lansdown-gardens, u.t. 48 yrs., g.r. 9½, 98, r. 55½ ... 440
Heme Hill.—41, Hinton-rd., u.t. 72 yrs., g.r. 54, 108. ... 310
Brimsdown.—39, Endymion-rd., u.t. 78 yrs., g.r. 7, 108, r. 45½ ... 400
By T. WOODS (at Isleworth).
Isleworth, Middlesex.—74, South-st., with slaughter-house, yard, &c., f. r. 504 ... 1,030
72, 76, and 78, South-st., f. ... 610
1, 2, and 3, Milton-pl., f. ... 630
Woodlands, Ingress House, f. r. 504 ... 450
Hounslow, Middlesex.—1, 2, and 3, Axa-cottages, f. ... 400
1, 2, and 3, Maud-cottages, f. ... 400
By E. COLLIER (at Horse Shoe Hotel).
Tottenham.—Park-lane, The Park Hotel, u.t. 36 yrs., r. 105½, with goodwill ... 9,660
May 23.—By ALDER & CO.
Stoke Newington.—25, Lordship-park, u.t. 72½ yrs., g.r. 10½, 108, r. 604 ... 1,675
Camberwell.—2 and 4, Hardest-st., u.t. 66 yrs., g.r. 9½ ... 385
By H. J. BLISS & SONS.
Hackney.—24, Wetherell-rd., r. 304, also i.g.r. 11½, u.t. 50½ yrs., g.r. 6½ ... 550

[See also next page.]

CONTRACTS AND PUBLIC APPOINTMENTS.

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

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to Workhouse	Armagh Guardians	W. Calvert, Workhouse, Armagh	June 4
Russian Bath, Union-street	Leeds Corporation	W. S. Braithwaite, Architect, 6, South-parade, Leeds	do.
Stone Bridge over River Eye, Coveyheugh, N.B.	King's Lynn Corporation	T. Meak & Sons, Civil Engineers, 29, St. Andrew-sq., Edinburgh	do.
Surveyor's Materials	Layton (Essex) U.D.C.	H. J. Weaver, Civil Engineer, Town Hall, King's Lynn	do.
Street Works	Milnrow (Lancs) District Council	W. Dawson, Civil Engineer, Town Hall, Layton	do.
Surveyor's Materials	East Grinstead U.D.C.	W. H. Foster, Surveyor, Council Offices, Milnrow	do.
Road Materials	Ebchester Parish Council	B. Wilds, Surveyor, Council Offices, East Grinstead	do.
Footpath	Emmishill R.D.C.	J. Middleton, Council Offices, Ebchester	do.
Sewerage Works, Derrygonnelly	Wigston Magna (Leics.) U.D.C.	F. Elliot, Architect, Emmishill	do.
Paving Works	Rhymney (Wales) U.D.C.	A. H. Burgess, 1, Berridge-street, Leicester	do.
Sewerage Works (10 miles)	Watford U.D.C.	Surveyor, Council Offices, Rhymney	do.
Paving Works	do.	H. M. Turner, 14, High-street, Watford	June 5
Kerbing, &c.	Enfield U.D.C.	do.	do.
Granite (2,500 tons)	Belper R.D.C.	R. Collins, Surveyor, Court House, Enfield	do.
Reservoir	Bingham (Notts) E.D.C.	J. Frith, Engineer, Bastow, near Belper	do.
Wall, &c.	Seaford (Sussex) U.D.C.	C. Parham, Surveyor, Cotgrove, Notts	do.
Steading, Elgin	Cardiff Corporation	Rich & Witlet, Architects, Elgin	do.
Sewage Outfall Works	Southend Corporation	C. H. Priestley, Engineer, Town Hall, Cardiff	June 6
Cast-iron Girders, Columns, &c.	do.	A. Fidler, Civil Engineer, Town Hall, Southend	do.
Widening, &c., Bridge, Southchurch-avenue	Essex County Council	do.	do.
Two Shelters, Esplanade, West Cliff	do.	F. Whitmore, Architect, Duke-street, Chelmsford	do.
Forty Houses	York Equitable Indus. Soc., Ltd.	G. Caldwell, Architect, Penzance	do.
Police Station, &c., Southminster	Northern Co-op. Company	Pentz & Pentz, Architects, Lendal Chambers, York	do.
Renovation of Wesleyan Church Wall, Gwinear	Leicester Corporation	Brown & Watt, Architects, 17, Union-terrace, Aberdeen	do.
Coal Depot, Stabling, &c., Clementhorpe	Ealing U.D.C.	Stalker, Architect, 27, Highgate, Kendal	do.
Business Premises, Gallowgate, Aberdeen	Bishop Auckland Indus. Soc., Ltd.	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Eight Houses, Far Cross Bank, Kendal	Mr. D. Johnson	C. Jones, Civil Engineer, Public Buildings, Ealing	do.
Sewer	Midland Railway Company	F. H. Livesay, Architect, 107, Newgate-street, Bishop Auckland	June 7
Lodge, Walpole Park	Dartmouth Town Council	Engineer, Midland Railway Company's Offices, Derby	do.
Warehouses, Backway	Hargrave Parish Council	A. Smith, Civil Engineer, Victoria-road, Dartmouth	June 8
Farmhouses, Whamtown, near Carlisle	Hornsey U.D.C.	G. Wiggins, Hargrave, near Raunds, Northants	do.
Stabling, Leicester	Mr. J. B. Carr-Ellison	Griffith & Jones, Architects, Tonypantry	June 9
Sewerage Works, Fairview-road	Blackburn Union Guardians	Council Offices, southwood-lane, Highgate, N.	June 10
Three Houses, Tylorstown, Wales	Sanbury-on-Thames U.D.C.	M. T. Wilson, Architect, Alwicks	do.
Sewerage Works	Leamington Corporation	Hornsey & Mookman, Architects, 19, Railway-street, York	do.
Additions to Buildings, West Hedgely	Leamington Corporation	F. C. Budge, Architect, Union Offices, Cardwell-pl., Blackburn	do.
Church, Helmsley, Yorks.	Leamington Corporation	J. Bees, Architect, Hillside Cottage, Pentre	do.
Additions to Workhouse Infirmary, Haslingden-road	Leamington Corporation	H. F. Coates, Surveyor, Council Offices, Sanbury	do.
Schools, Blayney	Leamington Corporation	W. de Normauville, Engineer, Town Hall, Leamington	do.
Sewerage Works	Leamington Corporation	J. L. Smith & Davies, Architects, Aberdeen	do.
Concrete Weir	Leamington Corporation	Brierley & Holt, Civil Engineers, 29, Richmond-terr., Blackburn	do.
Additions to Chapel, Resolven, Wales	Leamington Corporation	P. W. Kneustubb, Surveyor, Haverhill	do.
Sewage Disposal Works	Leamington Corporation	J. H. Coupland, Shotley Bridge	do.
Granite Road Metal (100 tons)	Leamington Corporation	F. Whitmore, Surveyor, Chelmsford	do.
Limestone (200 tons)	Leamington Corporation	J. Mansergh, Engineer, 5, Victoria-street, Westminster, S.W.	do.
Road Widening	Leamington Corporation	G. E. Shore, Borough Surveyor, Earle-street, Crewe	do.
Laying and Supplying Water Mains	Leamington Corporation	H. Williams, Holyhead	June 11
Street Works	Leamington Corporation	Sterling & Swana, Engineers, Town Hall, Chapel-en-le-Frith	do.
Chapel, Kingsland, Holyhead	Leamington Corporation	H. Kendrick, Engineer, Gasworks, Salford, Manchester	do.
Cast-iron Pipes, &c.	Leamington Corporation	Clenk Office, Union Workhouse, Levenshstone, S.E.	do.
Gas-holder Tank	Leamington Corporation	T. Cookson, Civil Engineer, Town Hall, Preston	June 12
Mortuary, &c.	Leamington Corporation	H. C. Scapling, Architect, Court Chambers, Grimsby	June 14
Cast-iron Pipes (230 tons)	Leamington Corporation	Council Offices, The Broadway, Wimbledon	June 17
Infirmary, &c., Kilton Hill	Leamington Corporation	See Advertisement	do.
Making-up Roads	Leamington Corporation	E. A. Johnson, Architect, Merthyr	do.
Extensions to County Asylum Buildings	Leamington Corporation	Lund & Potter, Architects, Worthing, Sussex	do.
Offices, Dowlands	Leamington Corporation	H. J. Price, Architect, 24, Low-pavement, Nottingham	do.
Villa, Bath-road, Worthing	Leamington Corporation	A. A. Hunt, County Surveyor, Sudbury	do.
Additions to Shops, &c.	Leamington Corporation	H. J. Clarson, Borough Engineer, 22, Church-street, Tamworth	do.
Granite Road Metal (100 tons)	Leamington Corporation	J. H. Cooper, Architect, Lindum-road, Lincoln	do.
Chapel, &c., Rowston, Lincs	Leamington Corporation	J. Lund, Borough Surveyor, Town Hall, Bedford	do.
Lodge, Russell Park	Leamington Corporation	Hussey & Walcott, 1, Gray's Inn-place, London, W.C.	do.
Villa, Bush Hill Park, Enfield	Leamington Corporation	Hickton & Farmer, Architects, Walsall	do.
Chapel, Gosall, Staffs	Leamington Corporation	E. A. Johnson, Architect, Abergavenny	do.
Hospital, &c., Abergavenny	Leamington Corporation	W. D. Pratt, Architect, Caudon Chambers, Longrow, Nottingham	do.
Warehouse, London-road, Nottingham	Leamington Corporation		do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Sanitary Inspector	Holborn Borough Council	130 <i>l.</i> per annum	June 3
*Manager	Sheffield Corporation		June 5
*County Surveyor	Northampton County Council	350 <i>l.</i> per annum	June 7

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. — Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xix. & xxii.

Bethnal Green.—2, Digby-st., f.	£110	9, Union-court and 7, Pea Hen-court, u.t.	Hackney.—23 and 24, Regent's-row, u.t. 42 yrs.,	
19, 21, and 27, Ames-st., f.	695	47 yrs., gr. 27 <i>ol.</i> , e.r. 7 <i>ol.</i>	gr. 6 <i>l.</i>	£410
7, Norton-st., f.	290	Peckham.—2 and 4, Barry-rd., f., r. 6 <i>ol.</i>	By NEWBORN, EDWARDS, & SHEPARD.	
4 and 67, Moss-st., f.	360	Barry-rd., f.g.r.'s 7 <i>ol.</i> , reversion in 91 yrs.	Canonbury.—5, St. Paul's-rd., u.t. 45 yrs., g.r. 7 <i>ol.</i> ,	
14, Braemar-st., f.	275	Tyrrill-rd., f.g.r. 21 <i>ol.</i> , reversion in 94 yrs.	gr. 6 <i>ol.</i>	555
1 Mile End.—43, West-st., f.	190	Tyrrill-rd., f.g.r. 7 <i>ol.</i> 5 <i>ol.</i> , reversion in 93 yrs.	Chalk Farm.—108, King Henry's-rd., u.t. 51 yrs.,	
By CHESTERTON & SONS.			gr. 15 <i>ol.</i> , f. 7 <i>ol.</i>	590
Kensington.—33, Warwick-gdns., u.t. 48 yrs.,	1,000	By MAPLE & Co.	Hoxton.—25 to 33 (odd), Cavendish-st., u.t. 22 <i>ol.</i>	
gr. 5 <i>ol.</i>		Finchley.—Woodside Grange-rd., Hampsterley,	Yrs. gr. 6 <i>ol.</i>	245
By DEBENHAM, TEWSON & Co.		f., r. 7 <i>ol.</i>	reversion in 51 yrs.	300
Clapham Common.—Thurleigh-rd., Hazlehurst	1,900	Woodside Park-rd., Haslemere, f., e.r. 65 <i>ol.</i>	Tottenham.—1 and 5, Vincent-rd., u.t. 83 <i>ol.</i> yrs.,	
and St. Romans, area 2r. 36 p., f., r. 15 <i>ol.</i>	3,050	By C. C. & T. MOORE.	gr. 10 <i>ol.</i> 10 <i>ol.</i>	470
Thurleigh-rd., St. Bede's and 2r. 31 p., f.	1,900	Poplar.—13 and 15, Ellice-rd., f.	Kenilworth Town.—1, Leighton-rd., u.t. 51 yrs.	
Thurleigh-rd., Summerfield, St. Cuthbert's,	4,695	7 and 9, Mark-ld., u.t. 38 yrs., gr. 10 <i>ol.</i>	gr. 10 <i>ol.</i> 10 <i>ol.</i> , r. 48 <i>ol.</i>	365
Lansdowne and Sunningburg House, f., r. 28 <i>ol.</i>	3,700	Nford, Essex.—High-rd., Cricklewood, f., r. 28 <i>ol.</i>	30 Camden Town.—24 and 26, St. Paul's-cren., u.t. 49	
Thurleigh-rd., Rosdene and r. 5 p., f., r. 2 <i>ol.</i>	1,760	239, St. Mary's-rd., f.	Yrs., g.r. nil, f. 7 <i>ol.</i>	970
Sudbrooke-rd., a block of building land, 1 a. 0 r.		Canning Town.—38, Fox-st., f.	Tottenham.—34, 36, 22 to 26 (even), Cranleigh-rd.,	
16 p., f., r. 35 <i>ol.</i>		44, 10 <i>ol.</i>	u.t. 86 <i>ol.</i> yrs., gr. 22 <i>ol.</i> 5 <i>ol.</i>	2,365
By FAREBROTHER, ELLIS, & Co.		Victoria Park.—18, Cawley-rd., u.t. 52 <i>ol.</i> yrs., g.r.	By ROGERS, CHAPMAN, & THOMAS.	
City of London.—77 and 77 <i>ol.</i> , Bishop-gate-st.	29,000	6 <i>ol.</i> , e.r. 45 <i>ol.</i>	Fimlico.—47 to 65 (odd), Gillingham-st., u.t. 26	
Within, area 3,800 f., f., r. 1,84 <i>ol.</i>		Forest Gate.—53 to 71 (odd), Chestnut-av., f.	Yrs., g.r. 10 <i>ol.</i> , f. 34 <i>ol.</i>	3,500

By STIMSON & SONS.

Table listing property addresses and prices, including Peckham, Dulwich, Camberwell, and other areas.

Table listing property addresses and prices, including King's Heath, Worcester, and other areas.

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing various materials like Bricks, Hard Stocks, Facing Stocks, and their prices.

SLATES.

Table listing slate products and their prices, including Ancestor in blocks, Bath, Farleigh Down Bath, etc.

PRICES CURRENT (Continued).

Table listing Tiles and their prices, including Best plain red roofing tiles, Hip and valley tiles, etc.

WOOD.

Table listing Building Wood—Yellow, Deals, Battens, and other wood products.

JOISTERS' WOOD.

Table listing Joist Wood products like White Sea, Second yellow deals, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing English Sheet Glass in Crates with various sizes and prices.

OILS, &c.

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VARNISHES, &c.

Table listing Varnishes and other products like Fine Elastic Copal Varnish, etc.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications.

JOISTS, GIRDEES, &c.

Table listing Joists, Girders, and other products like Rolled Steel Joists, Compound Girders, etc.

PRICES CURRENT (Continued).

METALS.

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COPPER—

Table listing Copper products like Strong Sheet, Brass, etc.

TIN—English Ingots.

Table listing Tin products like Tin—English Ingots, Solder—Plumbers', etc.

Raw Linseed Oil in pipes.

Table listing Raw Linseed Oil in pipes and other oil products.

VARNISHES, &c.

Table listing Varnishes and other products like Fine Elastic Copal Varnish, etc.

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JOISTS, GIRDEES, &c.

Table listing Joists, Girders, and other products like Rolled Steel Joists, Compound Girders, etc.

TENDERS.

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

* Denotes accepted. † Denotes provisionally accepted.

BURY (Lancs).—For the erection of two shops, Stanley-street, for the executors of the late Mr. T. T. Newbold. Messrs. Openshaw & Gill, architects, Derby Chambers, Fleet-street, Bury. Quantities by Mr. Wm. E. Gill:—

Table with 2 columns: Name and Amount. Includes John Tinline, Thompson & Bierley, Hutchinson & Holt, John Hall, John Inman, James Byrom, Robt. Hall, S. Clough School, Brown, Bury.

CARSHALTON.—For decorations at the Sun Inn. Messrs. Chart, Son, & Reading, architects, Croydon:—

Table with 2 columns: Name and Amount. Includes Smith & Son, Burnand, Wallington.

CATERHAM.—For decorations at the Asylum Tavern. Messrs. Chart, Son, & Reading, architects, Croydon:—

Table with 2 columns: Name and Amount. Includes Cheeseman, Bacon, Card, Vaughan.

CHELSHAM.—For rebuilding the Bull Inn, Chelsham Common. Messrs. Chart, Son, & Reading, architects, Croydon:—

Table with 2 columns: Name and Amount. Includes Worsfold & Son, Cheeseman, Tuetts & Steel, Knight, Quittenton, Bacon, Goulder, Burnand, Smith & Son, don.

CLAY CROSS (Derbyshire).—For the erection of a mission hall for the Methodist New Connexion. Mr. Ernest Oxley, architect, Clay Cross. Quantities by architect:—

Table with 2 columns: Name and Amount. Includes Robert Peck, William Forrest, George Hoyes, Frank Lee, John Madin, Eustace Tinkler, Clay Cross.

KENLEY.—For the erection of a billiard-room at Hillside, for Mr. Geo. Turner. Messrs. Chart, Son, & Reading, architects, Reading:—

Table with 2 columns: Name and Amount. Includes Stewart & Sons, Goulder, Quittenton, J. & J. Ward, Waller, Battley, Son, & Holmes, Cheeseman, Burnand, Horrocks, Smith & Son, Bacon, Heath.

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Table with 2 columns: Name and Amount. Includes Patman & Fotheringham, Rider & Son, Messom & Sons, Mowlem & Co., Patrick & Son, Higgs & Hill, Perry & Co., Martin, Wells, & Co., George Gray, Holloway Bros., Alfred Bush, Gregory & Co., Kilby & Gayford, Gough & Co., Extra for Glazed Brick.

LONDON.—For the construction of an underground convenience, Artichoke-place, Church-street, Camberwell, for the Camberwell Borough Council. Mr. W. Oxtoby, Engineer, Town Hall, Peckham-road, S.E.:—

Table with 2 columns: Name and Amount. Includes W. Shurmu, Doulton & Co., Finch & Co., Foster Bros., W. Smith, G. H. Jennings.

MITCHAM.—For alterations and repairs at the Ship beerhouse. Messrs. Chart, Son, & Reading, architects, Croydon:—

Table with 2 columns: Name and Amount. Includes Smith & Son, Haydon, Sayers, Burnand, Burgess & Sons, Bacon, Thornton Heath.

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RAYWOOD STREET.—Exterior painting:—

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The Builder.

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JUNE 8, 1901.

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Technical Schools, Scarborough.—Messrs. Hall, Cooper, & Davis, Architects—	
North Side and South Side	Two Single-Page Tone Blocks.
The Hall and Fireplace in Hall	Two Single-Page Tone Blocks.
Sculptured Panels.—Mr. H. C. Fehr, Sculptor	One Double-Page Tone Block.

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Art at the Glasgow Exhibition.



THE Exhibition is a real triumph for Glasgow. A few weeks ago we gave some description of the buildings, accompanied by some admirable sketches by Mr. A. McGibbon, made especially for our pages, and which will have given our readers some idea of the picturesque and original character of the Exhibition architecture, which, if it does not show all the extraordinary vigour and variety of invention of the Paris Exhibition buildings (for which, of course, there is hardly scope in the far more limited scheme of the Glasgow show), may be said on the other hand to have the virtue of more complete consistency of general style, and of presenting nothing anywhere that can be said to be in bad taste. But a walk through the Exhibition, by way of getting a general idea of its arrangement, leads to the further conclusion that no exhibition of the kind could have been better and more systematically arranged; indeed it may be doubted whether there has ever been one so well arranged. No space is lost, and there are no labyrinths; the whole gives the impression of having been carefully thought out from the first, and arranged on a comprehensive plan. One is struck also with the entire suitability of the construction everywhere, and the degree of original character which we find given even to such minor details as stall railings and barriers, which for the most part seem to have come under the influence of the prevailing spirit of the place.

Taking it as a whole, and considering the value and interest of the works of art collected, and the general artistic spirit which pervades it, it must be admitted that London has never had such an exhibition as is now to be seen at Glasgow.

The connexion of Messrs. Simpson & Allen's fine suite of art galleries with the

Exhibition is of course a great point in its favour; this permanent building forms an architectural centre round which the whole exhibition is grouped; and this and the University building, standing on high ground on opposite sides of the little valley through which the Kelvin runs, form the two dominant features in the scene, and add very much to the general effect of the whole view as seen within the grounds. We may take the opportunity of bestowing a few words of appreciation on the art galleries building itself; a building such as one does not get into every day. Externally, with its fine stone and the reticent but judicious use of sculptural decoration, it gives a very satisfactory impression, which is increased when we make acquaintance with the interior. The plan, with its large hall at right angles with the larger axis of the building, and the side galleries opening from it symmetrically to right and left, is admirably adapted both for interior effect and for the distribution and grouping of works of art. The central hall rises in one height to the ceiling, but with an open gallery round it on the first floor level; and the side galleries occupy both ground and first floor levels, each with an open court in the centre with an arcaded gallery round, outside of which are the suites of rooms in which the various works of art are arranged and classified. Sculpture occupies the central spaces both in the central hall and in the side courts; pictures are arranged in suites of galleries on the first floor; the galleries of the ground floor are parcelled out for various classes of objects of artistic or archaeological interest, of which we will speak in due course.

It is of course our natural duty to look first at the large collection of architectural drawings, which are arranged in the side galleries or bays on the ground floor in the east court. For some reason, these exhibits, though numbered in the catalogue, have not been numbered on the walls, but they nearly all have the title and architect's name appended in print. The Institute of British Architects has a bay to itself, con-

taining objects specially lent for the occasion. These include the busts of Inigo Jones, Wren, Barry, and Street, placed at the four corners of the bay; Mr. Sargent's notable portrait of Mr. Penrose (one of the cleverest things he ever painted), the portraits of Cockerell and Scott, and various drawings of interest which are in the Institute collection. Among these are a sheet of drawings by Scamozzi; two views of the interior of Wren's Greek cross design for St. Paul's, as it should have been if built; an elaborate and well-known study of Donaldson's for a "Temple of Victory according to ancient usages"; and various drawings and designs by Inigo Jones. The present President of the Institute is suitably represented by his competition design for the completion of the South Kensington Museum, and the late Mr. Brydon by the large drawing of his intended circular court for the new Government offices, which we presume was selected and sent when there was no idea that it would have acquired an additional and melancholy interest from the death of the architect.

The remainder of the bays are filled with a very varied collection of drawings representing the work for the most part of living architects, and including many which we recognise as old friends and are glad to see again. In other cases we naturally come across drawings by Scottish architects with whose work we are not so familiar as with that of those who practise south of the Tweed. The next bay to the Institute exhibit is notable for some important ecclesiastical designs; Messrs. Austin & Paley's "St. George's, Stockport," shown in a grand drawing by Mr. Raffles Davison; Messrs. Jas. Brooks & Son's "St. Luke's, Enfield," which in its plain solidity of treatment forms an interesting contrast to the soaring character of Messrs. Austin & Paley's design; and Mr. Leonard Stokes' interior view of Miles Platting Church, which we remember very well at the Academy some little time ago, and which is one of the most original and powerfully treated of modern church interiors. The next bay is marked

by the model of Mr. Belcher's Colchester Town Hall tower, and a large perspective drawing of his design for the Eastern Telegraph offices. Mr. W. Flockhart exhibits his large view of a picturesque mansion called "Rosehaugh," and there are interiors by Messrs. Ernest George and L. Peto and Mr. Baillie Scott, and one of the best drawings of Mr. Arnold Mitchell, a design for a Municipal museum, which some of our readers will remember. We draw attention, however, to some exhibits by the Glasgow brethren; Mr. Honeyman's warehouse in Sauchiehall-street, a narrow front in which sculptural decoration has been very well applied, and which terminates with a gilded cupola (the actual building looks even better than the drawing); and a very peculiar drawing of the *Daily Record* office, by the same architect; this is shown in very sharp perspective, and looks nearly all white and blue; apparently the introduction of some blue glazed facing bricks is actually intended at the upper portion of the ground story; in the rest of the drawing all the shadows are put in blue; the effect is odd enough, but the whole is certainly an original effort in architectural illustration. In the succeeding bay Mr. J. J. Burnet shows photographs of the Gardner memorial church, hardly the best thing he has done—it is in a rather heavy type of quasi-Scottish Gothic. A drawing of the Scottish Legal Life Assurance buildings, by Mr. Skirving, recalls the time when Glasgow cultivated a neo-Greek style, which was then supposed (in Glasgow) to be the thing for giving life and high artistic character to modern architecture, and in which some most admirable buildings were carried out; but it has nevertheless had its day, and is not likely to be revived. The name of Mr. Jas. Salmon is appended to some characteristic interiors, and to a watercolour view of a "Marine Hotel at Trooo," which has the merit of looking very unlike the usual florid type of hotel architecture, and is a really pleasing building in a quiet Gothic style.

Crossing over to the south side of the court, we find in the corresponding bay opposite Mr. Brydon's exterior perspective of the Government Offices, and Mr. Clifford's first premiated design for the Glasgow Royal Infirmary (illustrated in the *Builder* of February 2); and in this bay is also to be found a large exhibit in the round for the "treatment of the end of a room," though whether this is the actual work itself or an imitative reduction of it we do not quite gather; if it is the actual work its title should be "treatment at the end of a room," as it could not occupy the whole end. It is a curious affair, and we presume represents the taste of the latest school of applied art in Glasgow. There is a fireplace and a lofty over-decoration in hammered brass of a type of design which we should call the "ostentatiously naïve," where there is not a line or an angle correct, but all seems as if it had been done by accident; this hammered brass-work mounts aloft and finishes in a clock which strikes the hours on a visible square bell of the sheep-bell type, and into the space above the fireplace is inserted a tile Mosaic figure designed by Mr. Stephen Adam. The brasswork is by the "Holland House Electrical Manufacturing Company." This brass erection is relieved against a mass of dark mottled marble,

dished outward on plan, and cut across, two-thirds up, by an alto-relief plaster frieze modelled by Mr. A. Hodge (who has done so much of the sculpture decoration of the exhibition), and having the appearance of going behind the brasswork and reappearing at the other side. This is an effective piece of work, and there can be no doubt of its novelty of character, but it is rather too odd, and represents a taste (in the treatment of the brass work at least) which can hardly take a permanent hold. Eccentric also is Mr. Edgar Wood's large drawing in the same bay, of a church interior, in thick heavy black ink line, and showing a church with rubble walls, a ponderous framed timber roof, and angels seated on the wood-e corbels. This looks curiously like an old drawing, and is original in that sense, but we should say the executed building would have a rather crude and semi-barbarous effect, like the drawing.

In the next bay is Messrs. Sydney Mitchell & Wilson's drawing of Craig House Asylum for the Insane, a very picturesque group, but with no plan, which is imperative for such a class of building. Their Commercial Bank buildings, Edinburgh, is a powerful and remarkable example of street architecture, with deeply-recessed and boldly-moulded window arches, a parapet standing far out beyond the wall line on very boldly-treated corbelling, and a large circular angle turret corbelled out from the building in the manner which is so peculiarly characteristic of Scottish architecture. There is nothing tame about this building, at all events, and at the same time it is worked out carefully and logically. In the same bay are several of the most striking of Mr. H. Wilson's large architectural drawings, displaying such a mastery of water-colour effect and such inventive fancy, which have from time to time appeared on the walls of the architectural room at the Royal Academy. Logic is the quality which these want; it is difficult to make out what plan or construction is intended for most of them, and the author seems to feel this himself, inasmuch as he has declined to give any titles to them in the catalogue, beyond the general statement that they are architectural drawings. Nevertheless, they are efforts of genius in imaginative architectural effect, and show the hand of a master in the treatment of watercolour, and as such one is always glad to see them; if not constructional, they are at all events suggestive.

An old drawing of the Glasgow Public Hall, by the late Mr. Campbell Douglas and the late Mr. J. Cunningham, of Liverpool, jointly, is an interesting example of old Glasgow taste in classic architecture, a good thing of its kind, and reminding us pleasantly of something that is gone. The late Mr. Young's two drawings of the Staircase of Glasgow Municipal Buildings are here—Classic with a fresher feeling about it; and in the same bay a number of small illustrations of work by Mr. W. Leiper, which will be found of considerable interest, especially his coloured elevation drawings for the decoration of the walls and ceiling of a banqueting-hall, which is an admirable piece of decorative work. The large photograph of his Sun Insurance buildings bears on its frame the label "Médaille d'Argent," so that it has obviously obtained recognition across the Channel. Mr. Rowand Anderson

shows a number of photographs of his executed works (the three monuments to Montrose, Inglis, and Findlay, make a very interesting frame). In the next bay is an original and interesting piece of modern Classic design in the shape of a drawing of Govan Town Hall, designed by Messrs. Thomson & Sandilands; a building very well and effectively grouped, and shown in a fine and freely-handled pen drawing. In the last bay we notice Mr. J. J. Burnet's photographs of Rachan House interiors, also his Public Baths at Alloa, very simply treated, but the long low building stopped by a higher block at the end has its effect nevertheless.

Yet though this is an interesting and varied collection of drawings, one cannot but be struck with the difference when we look at the small collection of French architectural designs which are in the first floor gallery at the south end of the large hall. Here, instead of perspective drawings, we have large-scale elevations and plans. There are those of the New Sorbonne, lent by M. Nénot, and which illustrate the planning and design of one of the largest and most complicated of modern buildings. There are also the plans and a very large-scale elevation of M. Dourgnon's design for the Cairo Museum, the plan of which, very simple in conception, seems very well suited to its purpose, consisting of a central long hall with a series of smaller colonnaded halls opening out of it on the right and left, intended for the classification of exhibits; the whole surrounded by a "galerie de circulation" running all round the building. The elevation is not what one would wish; it is academical French treatment of Roman architecture; the architect might surely have given some suggestion of Egyptian influence or association in the design. There is also a beautiful set of large drawings of antique detail, by M. Henri Eustache, a Villa Medici student, and a fine monochrome drawing of the courtyard façade of the Pitti Palace. Near the end of this gallery is the small architectural show of the United States architects, who for their part have not thought it worth while to do more than send a frame of small photographs of buildings, with a reference list of their names and purposes; a very amateur way of illustrating architecture.

We may devote the remainder of this article to further remarks on the contents of the Art Galleries, which form a department by themselves in the Exhibition, with a separate catalogue, and which comprise a very fine and indeed remarkable collection of art and antiquities; remarkable not so much for its extent (though that is considerable) as for the variety it displays, and the excellent judgment which seems to have been used in getting it together. The sculpture is of course arranged on the ground floor, in the central hall and in the east and west courts; most of the works are known to those of our readers who are interested in English sculpture, and have been commented on before, and many of them illustrated, in our pages, so that it is unnecessary to criticise them over again. We may mention among well-known works, that are present Mr. Onslow Ford's Shelley Monument; Mr. Gilbert's Jubilee Trophy and his beautiful "Perseus Arming," Mr. Stirling Lee's "Dawn of Womanhood," Mr. Pegram's "Fortune," Mr. Luchesi's

"Oblivion" and other figures by him; Mr. Onslow Ford's "Echo"; Mr. Pomeroy's admirable figure "The Potter, Mr. Mullins's "Cain," and Mr. Colton's "Hyde Park Fountain; and many others, forming a very good representation of the present state of English sculpture. There are two or three French works by M. Rodin; his "John the Baptist," in which one is glad for once to see a finished work by this artist, who has lately preferred to leave his work in a fragmentary or half-finished state; this is a fine work, and there is a desire that it should be secured for Glasgow. There is also another powerful figure by M. Rodin, "Un Bourgeois de Calais," who from his costume and the key that he holds is evidently meant to represent one of those unfortunate burghers of Calais who were made to come out and humble themselves before Edward III.; this is a fine and robust work. M. Saint Marceaux's "Première Communion," which also we do not remember to have seen before, is worth remark as a fine and feeling treatment of a religious subject in sculpture.

Pictures are arranged in the first-floor galleries surrounding the east and west courts; two long galleries and one small one are devoted to living British oil-painters, and the same space to those deceased; a long gallery and a small one are given to British water-colour artists, one long gallery to foreign oil-paintings, and one small one to foreign water-colours. A single gallery seems certainly a small provision for representing foreign painters in oil, and of course no figure subjects of great size or of the first importance are there, as there could not be room for them, foreign painters generally occupying larger canvases for this class of work than we do. Yet this one gallery is full of interest, it contains so many small works by remarkable and original painters. There are some very fine Corots; one of the largest and finest we have seen by Diaz (of whom there are several examples); several very fine specimens of Troyon's landscape and cattle scenes; a splendidly built-up forest scene by Rousseau, in his finest manner; two Mauves without a sheep in them (!), and admirable pictures nevertheless; several very good examples of the varied but not always satisfactory art of Maris; and some evidently early works by Millet which are of considerable interest. There is also a fine landscape by M. Harpignies, and an exceptionally good example of Daubigny. What we complain of in the selection is that there are too many examples of Monticelli, an eccentric and irritating painter who does not represent the best paths of art.

The room of foreign water-colours ought to be of interest, also, from the very fact that it represents a kind of art so different from most of English water-colour. There is less finish, far less captivation of colour; but there is perhaps a more distinct intellectual *motif* in these comparatively grey drawings than we should be likely to find in an equally representative collection of British work. The collection is mainly Dutch, including such names as Mauve, Blommers, Neuhys, Artz, Israels, Mollinger (who appears to be a kind of Dutch Boyce), Ter Meulen, and others. There are a few French works, among which is a curious pastel by Millet, "The Sheep Fold," a moonlight scene in which the moon really seems to shine with a luminous effect.

The collection of works of living British artists contains of course a great many well-known works, including some of exceptional interest, which one is always glad to have a fresh opportunity of seeing. We can only mention, among the more important of these works of first-class interest, Mr. Holman Hunt's "Strayed Sheep" and "Christ in the Temple"; Sir L. Alma-Tadema's "The End of a Joyful Day" and "Thou Rose of all the Roses"; Mr. Fildes's "Village Wedding"; Mr. Orchardson's "Hard Hit!" Mr. Abbey's "Trial of Queen Katherine," and Sir E. Poynter's "The Greek Dance"; Mr. Holman Hunt's "Awakened Conscience"; Mr. Watts's "Orpheus and Eurydice"; and Mr. Brett's truly remarkable early work (which we had forgotten), "The Stone-breaker," a painting essentially "pre-Raphaelite" in character, and of a finish and minuteness of execution which even Mr. Holman Hunt has not surpassed. Among Sir Noel Paton's hard and gaudily-coloured paintings that called "The Bludie Tryst," a picture painted many years ago, is a work of some tragic power; Sir George Reid has some exceedingly fine portraits; and there are some landscapes and seascapes by members of the Scottish Academy whose names are less familiar, and which hold their place admirably; more particularly Mr. McTaggart's "The Storm" and "Over the Harbour Bar," Mr. Paterson's "Edinburgh" with a deserted quarry as a foreground; Mr. Henderson's "A Fresh Breeze," and Mr. Beattie Brown's "A Lonely Cot."

The collection, however, of deceased British artists surpasses the other in interest, and reminds one of some reputations nearly forgotten, on this side of the Tweed at any rate. The very first work hung, "Garleton Tower," by the Rev. John Thomson (Thomson of Duddingston), though sadly cracked, is sufficient to show what a really great landscape-painter Scotland possessed in this clerical amateur. All the landscapes bearing the name of Sam Bough are fine; we have seen a complaint somewhere that too many of his were hung, but they are all worth recognition. Few people in England know the name of Tonge, but they will find everything with that name worth looking at. Alexander Fraser is another deceased Scottish painter of great power; witness his picture called "The Margin of the Forest." Milne Donald is the name of a landscape-painter whom we do not remember, but who was no ordinary artist; also James Docharty; also G. P. Chalmers, whose beautiful work "The End of the Harvest," with the evening sky making level lines behind the tree stems, reminds us of some of the best of a living French landscape-painter, M. Lamy. Among other remarkable landscapes is Müller's grand work, "Eel Bucks at Goring," in which, for power and freedom of style, he has almost surpassed his more celebrated contemporary and friend, Constable. Prominent also among landscapes are Poole's "The Dragon's Cavern," David Cox's "Changing Pasture," Turner's "Mercury and Argus," "Linnell's "Vale of Dolwyddelan," Henry Moore's "St. Albans Race," and Alfred Hunt's "Dunstanborough." Some small examples of Etty and William Dyce remind us pleasantly, in very different styles, of two painters once more celebrated than they are now. Wilkie's "Village Politicians" and "Letter of Introduction" are to be seen—the

latter one of the best and most complete things he ever painted. The "Ploughing Match" by Wm. Davis, reminds us of a gifted and conscientious artist who merited better recognition than he met with in his life time. Among the important works of more recent date or better known to fame will be found Millais' "Carpenter's Shop" and "Chill October," Leighton's "Hercules and Death," Millais' "Autumn Leaves," and Rossetti's "Mariana." The collection is indeed one of no ordinary interest.

The south-west gallery is devoted to a most interesting collection of memorials of old Glasgow. Here again Sam Bough is at once topographically careful and artistically fine in his views of "Stockwell Bridge" and "Broomielaw Bridge." Among the interesting relics is the cylinder of the engine of the *Comet*, the first steamer which plied on the Clyde; a cast-iron cylinder about 2 ft. high and 1 ft. diameter. Spinning-wheels in excellent preservation; some old silver Highland plaid brooches; a rams-horn "sneeshing-mull" with a hand-painted miniature in a panel on the top; some fine examples of old Scottish hall-marked silver, perfectly plain but excellent in shape—especially a large punch-bowl with wavy margin, lent by the earl of Breadalbane; these are among the curiosities of this collection.

In the East Gallery is a collection of loan objects, mostly of ancient art. Case L contains two of special interest. One of these is a small circular personal ornament of enamelled gold, enclosing a coloured alto-relief of the adoration of the Magi. This is a most curious little bit of work, lent by Sir T. Gibson-Carmichael, said to be Venetian of the date of 1480. A square silver casket lent by Lord Malcolm of Pottaloch, of French make and probably late seventeenth century, is interesting from its refined semi-architectural treatment; it is divided into bays by playfully treated pilasters, in a form suited to metal work, with panels between enclosing little bas-relief figures. In the small square gallery at south-east angle of the building is the highly creditable work of the Glasgow School of Art students; in the corresponding gallery at the north-east angle are some examples of modern decorative work. Among these is a fine electric light stand in cast silver, by Mr. Alexander Fisher; a stem and table something like the most usual type of sun-dial, with a glass canopy carried on four light shafts above, and under this a nude figure standing on a crystal sphere, and pointing upwards to the light under the glazed dome. A large exhibit against the wall, as to which there is no explanation in the catalogue and no label, is of some interest; it evidently represents one of the latest ideas in Glasgow for a street entry; the lower portion of the opening is flanked by plain black marble jambs with a white marble corbel at the top, from which spring the lines of the wooden erection over it ending in a cornice; over the doorway, on a large repoussé circular plaque of gilt metal, the number "12" is shown in two ways, one for daytime, the other to show at night as a perforated figure in Roman numerals, with a light behind it. This design is, we presume, another example of up-to-date applied art in Glasgow; and if a little eccentric, it is certainly effective and original.

NOTES.

The Liverpool
Cathedral
Question.

An article in the *Liverpool Courier* on this subject last week, in favour of the St. James's Mount site for the Liverpool Cathedral, is headed by a plan of the site, showing the ground plan of Mr. Emerson's design as placed on the site. This plan is at once the strongest possible condemnation of the site on architectural grounds. It shows the cathedral with its side facing down hill towards the principal street adjoining, and its east and west ends facing nothing whatever. A cathedral facing downhill eastward or westward may have a fine effect; one facing downhill sideways has the worst possible effect. No one with a feeling for architectural position and alignment of a large building could ever have recommended such a situation. On architectural grounds, at all events, it will be a complete mistake.

A Note on
Cyprus.

SOME little effort is being made by the Society for the Protection of Ancient Buildings to preserve the singularly interesting remains of the city of Famagusta (the city still retains its ancient walls, cathedral, several churches, &c.), about which there was a considerable correspondence in the *Times* more than a year ago. It is to be hoped this marvellously preserved relic of the Middle Ages may escape its threatened fate, and be preserved for future ages in the way in which Carcassonne has been set apart by the French Government as a national monument. M. Eulart, the author of the great work on Cyprus Medieval art, is at present in the island, engaged on a further study and report as to the condition of the antiquities, which seem to arouse more interest in France than in England, although the island has always had an interest for Englishmen ever since Richard I. conquered it and introduced Western civilisation in the twelfth century.

The Thames
Conservancy and
Sanitation.

THE most satisfactory part of the recently-published annual Report of the Thames Conservancy is that which relates to the sanitation of the districts adjoining the Thames or its tributary streams. That the Thames Conservancy should become a superintending Sanitary Authority for a large district is one of the most curious things in the history of sanitary progress in England. But having had the power conferred on it by the Legislature to keep the Thames and its tributaries from being polluted, it has been enabled to bring great pressure to bear on the Local Authorities who are responsible for the sanitary condition of the districts which are drained by the Thames and its tributary streams. The Conservancy has not hesitated to use the powers entrusted to it, and to put the law in force against the Local Authorities through whose omissions or commission any stream which feeds the Thames is polluted. The result has been a great and continuous improvement in the sanitary condition of the watershed of the Thames. Local Authorities have found that they had no option but to formulate and carry out schemes for the sanitary improvement of the places under their jurisdiction. That in so doing the Thames Conservancy has had a direct influence which was never for a moment

expected goes without saying. But the successful action of the Conservancy shows that County Councils should be armed with the power of compelling the smaller Sanitary Authorities to execute necessary works. In many instances some kind of compulsion is the only means of inducing Local Authorities to carry out their duties.

Municipal
Trading.

It will be remembered that a Committee of the House of Commons was appointed last session to inquire into the subject of municipal trading. It did not complete its inquiries, but it has not been reappointed. As we pointed out last year, the report of a committee of this kind cannot alter the state of affairs. Municipal trading will extend if the ratepayers and Parliament as a body sanction such extension. The limit of this extension will be put by the common-sense of the community. It is impossible, as was said before, to formulate with precision any definition of legitimate municipal trading. But as soon as municipal corporations begin to carry on enterprises which are not for the benefit of the public at large, then we may expect to see the ratepayers and Parliament put a veto on their work. For the moment a kind of languid interest in this respect has made its appearance, but the fact that last session's Committee was not reappointed shows pretty conclusively that the Government is not impressed with the opposition to municipal trading. For the opposition comes largely from powerful trading companies who are anxious to obtain monopolies in electric enterprises and locomotion. The ordinary citizen is inclined to think he would be as well off if his municipality managed these matters as a company whose main object is dividend. We expect therefore not to hear much more of the bugbear of municipal trading.

Electric
Lighting in
Dublin.

IN the "Journal" of the Institution of Electrical Engineers just issued there is an abstract of a paper by Mr. Robert Hammond describing the Dublin Corporation electric light scheme. The paper was read nearly a year ago before the Dublin local section of the Institution, and it seems a pity that it was not published earlier. Mr. Hammond's scheme is so novel and his exposition of it so clear, that it is a distinct loss to the profession that this paper has been so long overlooked. The electricity works are being built on Pigeon House Fort, an island in Dublin Bay, where land is cheap and there are no troublesome neighbours. The system of supply is to be three-phase alternating current, which can be used for either lighting or power purposes. Mr. Hammond's scheme has been subjected to a great deal of severe criticism, most of which comes from those interested in the Dublin Southern Tramway Company, which fears a powerful rival. Three cables, each containing three conductors, will connect the new station on the island with the old station in Fleet-street, a distance of about three miles. The pressure used will be 5,000 volts, and it will be distributed at this pressure to the nineteen sub-stations, where it will be reduced to 240 volts for consumers. Since the station is on an island, cheap coal can be delivered from shipboard, and unlimited water for condensing can be

pumped direct from the sea. Mr. Hammond has arranged most ingeniously for utilising as much of the old plant as possible, and as the frequency of the new alternating current is low, the operation of motors from the mains will be much more satisfactory. The public arc lighting will be done by 500 lamps, which will be run on a circuit of their own. Altogether the scheme is most promising, as the initial capital expenditure has been small and there seems every reason to expect that the subsequent working expenses will be small also.

WE understand that the proprietors of Coutts's Bank have purchased the Crown lease of Lowther Arcade, which was placed in the market three years ago by the trustees under the will of the late Mr. William Bird, and was withdrawn from the sale at auction at 30,000*l.* The Arcade, measuring 245 ft. long and 35 ft. high, and being lighted by a roof glazed with small domes carried by pendentives, was—together with the old Adelaide Gallery along its north side—erected after the plans and designs of Witherden Young, as a part of the extensive improvements effected in that portion of the Strand, the "Bermudas," "Porridge Island," and the neighbourhood of the church of St. Martin-in-the-Fields, in 1829-31, in pursuance of the Act 7 George IV., c. 77—Lord Lowther being Chief Commissioner of Woods and Forests at that time. W. C. Mylne acted as valuer on behalf of the Government, and Decimus Burton was architect of part of the new buildings in the West Strand quarter. The original Arcade had twenty-five shops, with six in West Strand and Adelaide-street, covering a total area of about 16,000 ft. superficial, and is held, under one lease of which 2½ years are still unexpired, at a ground-rent of 1,270*l.* per annum.

Lincoln's Inn-
fields and the
New Street.

IT is stated that for the development of their High Holborn to the Strand improvement scheme the London County Council have already acquired, and will at no distant date clear, the site of Nos. 57-58, on the west side of Lincoln's Inn-fields. The house is distinguished by a balustrade and cornice, a rusticated base, and a semi-circular portico with Doric fluted columns upon a rounded flight of steps. It is one of a block formerly known as Arch or West row, which was designed by Inigo Jones, and is depicted in the oil-colour painting cited as being at Wilton in Cunningham's "Life of Inigo Jones." But whereas the elevation has six Ionic pilasters carried up the upper floors of its front, the façade, built of stone, is apparently of a date somewhat later than Inigo Jones's day. John Forster occupied chambers in the northern half—now numbered "58"—of the house, wherein his rooms have been identified with those of Tulkington, as described in "Bleak House."

Sutton Place,
Guildford.

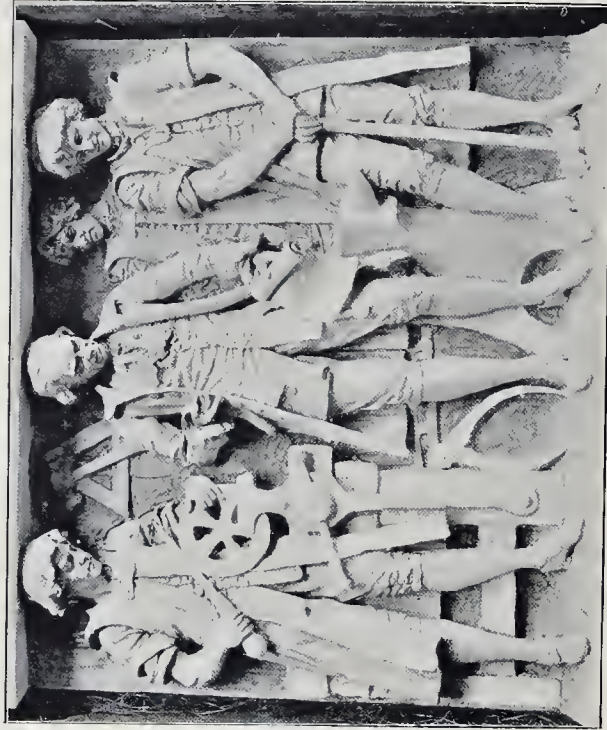
THE very fine old mansion, Sutton Place, near Guildford, was erected 1520-30 by Sir Richard Weston. The main fronts are built of terra-cotta and red brick. The bay windows, entrance doorways, parapets, and buttresses are elaborately enriched. The interior is as fine as the exterior; the great hall, staircase, and long gallery are all



THE BUILDER, JUNE 8, 1901.



I.



II.





III.



IV.

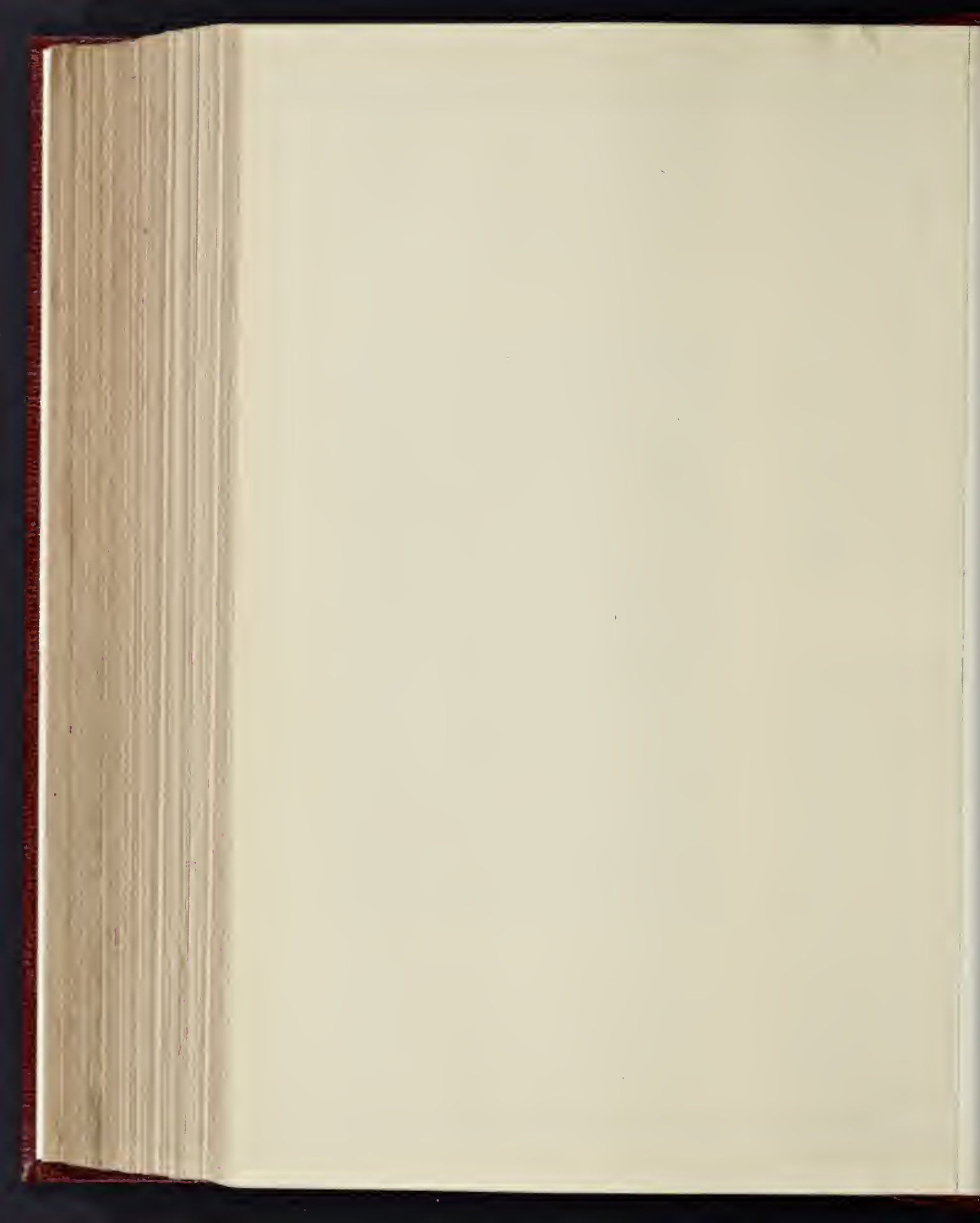
TECHNICAL SCHOOLS,
SCARBOROUGH:
SCULPTURED PANELS.

—
MR. H. C. FEHR,
SCULPTOR.



V.

- SUBJECTS OF PANELS.
I.—ASTRONOMY.
II.—ENGINEERING.
III.—CHEMISTRY.
IV.—ARCHITECTURE.
V.—LITERATURE.



panelled in oak. The rooms under the Long Gallery are, we are informed, to be decorated or restored; it is to be hoped that this work will be very carefully done, and under proper architectural direction, and in harmony and keeping with that existing, or this fine relic of the old times may suffer considerably. The house is illustrated in Nash's "Mansions."

The exhibition at the Fine Art Society's Gallery, now open, consists of a collection of water-colour drawings of the Holy Land and Egypt by the late Mr. Henry A. Harper. The collection is remarkable in being almost entirely composed of the original drawings made upon the artist's first visit to the East; since then Mr. Harper occupied a unique position as a delineator of that fascinating country. Considering the nature of the exhibition, it is not surprising that there are a great number of sketches that ought never to have been publicly exhibited. It must take more than one visit to catch the evanescent character of the many and changing aspects of the East. The most important drawing is that of Karnak, the Hall of Columns, a work of great imagination and power; it is full of subdued light and delicate colour, nothing being introduced to spoil the harmony and grandeur of the great vista of columns. Except for this drawing, the exhibits of interest are among the smaller sketches, such as the Great Market Place at Hebron and the "Es Sakrah," the Holy Rock in the Mosque of Omar, Jerusalem. No medium other than colour can adequately represent the architecture of the East or the charm of form and colour of the gaily dressed people. The drawing of the Great Market Place at Hebron has caught the peculiarities of the Eastern atmosphere. The cool dark market place with its mysterious shadows and fitting Arabs, while beyond, under the blazing sun, is a glimpse of the white walls and dome of a mosque. "Bedouin and Camels" is another aspect of sky and sunlight, the man and animals strongly drawn. Another sketch of interest is "A Bit of Old Blue," dyeing native stuffs in Damascus. Perhaps the best figure subject is that entitled "In the Bazaars, Jerusalem," which is superior to most of the early figure subjects here exhibited.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

The examples of decorative design in the architectural room this year are not numerous nor for the most part important. The two principal ones are hung at opposite ends of the room, and are both on too small a scale to be very well estimated in the position in which they are placed. One of these is a small model of a half dome, showing the design for the mosaic decoration of the dome at Giggleswick school chapel, by Mr. Geo. Murray (1,570). It is hung high up above the line of drawings, and the detail cannot be properly seen. The lower portion of the dome, for rather more than half the height, is occupied by figures of angels with their wings outspread and crossed, arranged in a decorative manner, but not with the stiffness and symmetry of outline which would be found, for instance, in a Byzantine decoration of similar class. One is not certain whether figures of angels arranged in this manner do not rather require that conventional stiffness of treatment, if they are arranged as symmetrical repetitions; whether these figures are not a little too free in line for the kind of treatment adopted. Each figure rises from, or takes a stand on, some

object of a dark colour the nature of which—whether a scroll or a cloud, or what—cannot be quite made out, and the effect is rather ragged, and as if they were standing on footstools. This portion of the dome has a gold ground between the figures; above this the ground is dark blue, with a collection of cherubs with nimbi round the base of the lantern, and at the base of the blue portion what appears to be a collection of birds in flight round the dome in the same horizontal direction. This is a pretty idea, and the general decorative effect of the whole promises well. At the opposite end of the room is hung Mr. Gryll's drawing of the design for the memorial window to the late Duke of Westminster, to fill the whole of the south transept end at Westminster Abbey (1,653). This is a coloured drawing of the stained glass lights, either in body-colour or inserted in cuts made in a very dark paper, so as to give as luminous an effect as possible to the colour. This is a good way of showing a window design on paper, and the general effect is rich and harmonious, but the drawing is a comparatively small one for the extent and elaboration of the design, and it is impossible, as it is hung, to make out anything of the detail. A design of such importance in regard to its effect on the Abbey should have been hung so that one could examine it better.

The other stained glass designs are mostly small windows of single figures. Mr. Leonard Walker's "Design for Stained Glass" (1,587) shows a draped figure with no architectural accessories, depending for effect simply on the design and drapery of the figure, which is rich in colour and in a freer style than is usual in stained glass work of the day; some patches of blue which seem to represent sky above and water at the feet of the figure serve as a colour contrast. This is a very nice little drawing. Mr. Percy Hammond's "Design for Stained Glass Window—St. Nicholas" (1,634) is in the more usual quasi-medieval style of modern stained glass; the figure, wearing a mitre, is clad in robes picked out with bits of rather delicate decorative detail, and relieved by a richly coloured drapery inserted as if hung behind the figure; the face is finely treated. The whole is surrounded with architectural detail and canopy work in white glass, of rather a heavy and lumpy kind of detail, looking like bad medieval work.

Mr. Jas. C. Powell's "East Window, Immanuelkirche, Frankfurt" (1,637) is a design on a very small scale for a large window of five lancet lights. The drawing is minute and carefully finished, and the character of the design is rather out of the common. Figure subjects form the dominating feature, but instead of being based on hard architectural pedestals and surrounded by imitation architectural detail, the figures are interwoven with a flowing scroll design, not symmetrical in line, and completely flat in character. This is much more in accordance with the true æsthetic requirements of stained-glass design than what we generally see, and merits recognition on that account. Mr. Arthur S. McNairn, in his "Design for Stained Glass" (1,662) has also got a rather new idea, composing the design of his three lights entirely of flowers and leaves; a pretty idea, and the colour effect is good, but the upright stems, with their twists and knots, are too realistic, and should have been conventionalised into a more decorative semblance; nevertheless, there is merit in this design. As the strongest possible contrast to this we have in the next drawing, "Design for Stained Glass Window, St. Peter's Church, Bayswater" (1,663), by Mr. Arthur J. Dix, the ordinary conventional treatment of a Renaissance architrave and broken pediment in white glass with yellow ornamental features; it is well and carefully done, and we presume that the style of church requires this style of treatment, or is supposed to do so; but somehow the more richly coloured picture of the Crucifixion, within this framework, gives one a kind of shock, it seems so out of keeping with its decorative surroundings. Mr. J. D. Forsyth's "Design for a Stained Glass Window" (1,668) is rather in the style of fresco than stained glass; a small drawing showing a figure of a woman—perhaps representing "Charity"—with a green drapery and accompanied by two nude children, another small nude figure is seated above in a separate compartment of the design; it is graceful as a whole, but suggests the idea of a design to be painted on glass rather than one put together out of glass with

the colour inherent in it, which is the true stained glass art. Mr. Lavers' "Design for a Stained Glass Window" (1,670), hung as a pendant to this, shows exactly the opposite principle of treatment, all the design being distinctly flat and conventional in character, and such as is especially suggestive of glass. The window contains a figure of St. Paul, the head and shoulders of which are thrown out by being relieved against a rich crimson patch filling the ogee arch of the ground; above this, as well as below the figure, is a form of ornament consisting of a blue tinted scroll design with the spaces between left white; on paper it rather suggests a metal grille, but might not do so in execution in glass; the whole would form a good and rather unusual window design.

Of decorative designs other than glass, a rather important one is shown by a sculptor; Mr. Thornycroft's design (1,555) for the bronze canopy which is to be enshrined, when in position, his group forming the Dean Colet memorial to be erected at St. Paul's School, West Kensington. This is exhibited under Mr. Thornycroft's name, and is, therefore, we presume, his design—possibly his own drawing. We fear it is only one more example of the fact that sculptors, whatever sympathy they may have with architecture in a theoretical sense, rarely understand how to handle architectural detail; certainly most of the detail here is exceedingly bad. The canopy is carried on thin, square, upright rods, coupled, each of which expands at the top into a large kind of cabbage leaf which supports, or rather does not support but finishes underneath a small shrine, with which it has no proper architectural connexion at all. The arched ribs which meet in the middle and give the canopy form to the whole, turn up into another cabbage-leaf on which is another shrine. The only bit of the work which represents good detail from an architect's point of view, is the horizontal band with a decorative filling which runs round above the springing of the canopy and binds the whole together; and that is out of keeping with the rest. We certainly think the sculptor would have acted more wisely, and done better for the school, to have got an architect to design the canopy for him.

Mr. E. M. Atkins's "Design for a Frieze—Wild Hyacinths" (1,549) is rather like some other designs we have seen at the Academy, either by him or others; the delicate blue flowers are treated in strings which form circles round some figures of children incorporated in the design, the general effect is pretty and decorative. Mr. Sidney Smith's designs for ceilings for a new residence in Sussex (1,574) are Classic panelled designs with enrichments, containing nothing new in idea; but which, over rooms which suit that style of ceiling, will have a rich and satisfactory effect; they are apparently for execution in plaster; there is only one tint over the whole of each ceiling, but the tints are varied, probably with reference to some variety in the general treatment of each room. Mr. T. H. Lyon's "Reredos for St. Michael's, Islington" (1,585) is a small drawing apparently executed in coloured crayons, showing a reredos composed of rather thin Gothic tracery (wood?) and a richly carved cornice picked out with gilding; the general effect is pleasing, but the drawing is really too small and too uncertain in execution to show the detail intelligibly. A more important piece of church work, or at least shown in a better and more important drawing, is Mr. A. C. Blomfield's "Memorial to the late Duke of Westminster" (1,652) to be placed in the south transept of Chester Cathedral. This is a tomb with a recumbent effigy, the side of the tomb divided by vertical mullions into four narrow and three square compartments, the latter filled with tracery designs and decorated with a coloured shield in the centre of each compartment; a separate drawing is given of the tomb railing, a good and carefully worked-out design of some originality of character.

Mr. F. L. Pearson's "Reposcè Metal Trip-tych for the Chapel, Cliveden" (1,076), is shown in a small and most minutely finished drawing. It is a kind of modern Romanesque in general character; the centre portion ends with a semi-circular finish, with folding doors with a quadrant finish expanded at each side; the altar below is of marble with pilasters enclosing square compartments which are filled with coloured mosaic designs in circles, with spandrel eyes at the angles. The design is made

the most of by the drawing, which is almost microscopic in delicacy. A much less sumptuous but an original piece of church furniture is the pulpit for All Saints', Leverstock Green (1,692), designed by Mr. Maxwell Ayrton. This, as we read on the drawing, is of English oak inlaid with ivory and pewter. The novel to the steps is treated in these materials, with vertical waving lines of inlay which have a very nice effect, and the whole thing is in excellent taste, but it wants the base to be a little strengthened or marked with a moulding, or in some other way; as it stands, it almost suggests the idea that something has been cut away from the bottom.

It was understood a year or two ago that mere representations of ancient architecture would not be accepted in future; and as to mere pictures of it we quite agree—they are of no architectural value, and take up unfairly the space which ought to be claimed by original designs; but we do not think the disqualification ought to extend to measured drawings of old work, which are often of real value. At all events, this clearance seems to have been made for the present, and one drawing alone of an old building finds place, whether by accident or by special grace—a small pen sketch by Mr. Raftes Davison of "Château Josselin" (1,673), a chateau with three great round towers coming down right into the existing roadway, with curtain walls between, diversified by arched corbel tables and dormers with small crocketed pinnacles. It is a picturesque bit of ancient work, and (needless to say) a very good sketch.

One rather regrets to find that models have dropped out again this year; at all events, if there were any sent they were not accepted. Models add very much to the interest of the architectural room, and are a form of architectural illustration which is on every ground to be encouraged; and as a beginning had been made a year or two ago, we hoped it would be continued. It must be admitted, however, that unless a man can make a model with his own hands, as one well-known architect does, it is a costly way of illustrating your work, and can only be undertaken by those who have a little spare money to lay out on such an object.

LETTER FROM PARIS.

The Grand Palais des Beaux Arts has by a recent decree been transferred from the holding of the Ministre du Commerce to that of the Ministre de l'Instruction Publique et des Beaux Arts, although a certain amount of work on the building still remains to be done under the direction of the former Minister to complete the terms of the contract made in view of the Exhibition of 1900.

M. Nénot, the architect of the new Sorbonne, has been actively pushing forward the interior decoration of his fine building. M. Dagnan-Bouveret has just fixed up in the Amphithéâtre de Richelieu his large fresco representing Apollo and the Muses. The work is not, however, yet complete, the artist promising to finish it for the end of July.

It has been decided partially to restore one of the oldest and also one of the smallest of Parisian churches, that of Saint Severin, almost hidden from public view behind the Boulevard Saint Germain. Although the scaffolding which for some years has surrounded the fine old church of Saint Eustache, near the Halles Centrales, has now been taken down, yet the restoration is far from complete, and will cost another 12,000*l.* as soon as funds are available.

At the last meeting of the Société des Amis des Monuments Parisiens it was decided to enter a protest against the mutilation of the Place de la Bourse and of the Palais de la Bourse itself by the construction of the proposed new wings on either side of the building, which, it is contended, will entirely spoil the aspect of the Bourse and the surrounding square; to support M. Charles Garnier, with his scheme for the formation of a museum of toilette, costume, and public art; to urge the completion of the work of restoring the churches of Saint Eustache and Saint Pierre de Montmartre; and to take into hand the defence of the interesting old houses near the Pont Neuf.

The annual congress of the Société des Architectes Français will be held at Nancy and at Paris from June 23 to 29. The programme will comprise visits to the monuments and artistic works in Nancy and the neighbour-

hood, excursions to several neighbouring towns, and—on the return to Paris—the discussion of several important questions, amongst which will be the rules and regulations of street frontage and their effect on architectural style, architects' fees, and the federation of architectural societies. The annual distribution of awards to architects and builders will take place, as usual, in the amphithéâtre of the Ecole des Beaux Arts.

M. Louis Bonnier, Président de la Société des Architectes Diplômés, architecte en chef des installations de l'Exposition de 1900, has been appointed to the post of architect of the Palais de l'Elysée, left vacant by the death of M. Adrien Chancel.

M. Dubuc, Municipal Councillor, brings forward the evident inferiority of the French artist compared with the English artist on the footing of applied arts. Considering that this inferiority is due to the want of co-operation between the producer and the consumer, he proposes, as a means to elevate the taste of the consumer and bring him more into contact with the best work of the producer, to install each month in the Petit Palais des Beaux Arts small exhibitions of the work of twelve artists chosen from the various categories of applied art, these artists exhibiting not only their complete work, but also the sketches and rough models which formed portion of their work. The general public will be admitted to these exhibitions, and the pupils of the various schools of art will be taken to view and study the works, and thus taking inspiration from their elders, gradually help to create a national style of applied arts. The scheme has received the approval and support of a number of well-known artists.

M. Pascal, the well-known architect, has just taken possession of the piece of ground in the centre of the Place Victor Hugo, destined for the erection of the pedestal of the monument to be erected by Victor Hugo, of which a life-size model by the sculptor Barrias was exhibited in the centre of the hall of the Grand Palais last year. The monument will be inaugurated in the spring of next year, on the date of the centenary of the birth of the poet.

The various offices and administration of the Ecole des Beaux Arts have now been removed to the luxuriously decorated rooms of the old Hôtel de Chimay, next to the Ecole buildings, and acquired by the administration for the sum of 280,000*l.* The portion of the Ecole now left vacant will be arranged as study rooms for the Prix de Rome competitions.

The important case of responsibilities for the accident of the footbridge leading to the Globe Celeste at the late Exhibition, by the fall of which several lives were lost last year, is now before the Court of Justice. It will be remembered that this footbridge was constructed of armed cement according to the system called Matrai. The Public Prosecutor maintains that the pillars of the bridge were of insufficient strength, that the arches were badly constructed, and that the cables under tension at either end of the bridge were not in the same vertical plane, and therefore tended to upset the whole of the construction. The architect, M. Galeron, declines all responsibility, throwing this on the engineer who conducted the work, M. Tedesco; the latter, however, casts the responsibility on to the contractor, M. Matrai, who prepared the plans; this last, however, states that the engineer had the carrying out of the work entirely in his own hands, and modified the plans and scheme of construction without consulting the contractor.

The jury of the section of architecture at the Salon des Artistes Français voted on the 31st ult. the various awards to architects. One round of voting was sufficient for making the unanimous award of the medal of honour to M. Tournaire for his remarkable contribution showing the actual state and the scheme of restoration of the ancient Temple of Delphos. M. Tournaire, a native of Nice, was pupil of M. André at the Ecole des Beaux Arts; he carried off the Grand Prix de Rome in 1888, and was awarded a grand prix and made Chevalier de la Légion d'Honneur at the late Exhibition. M. Tournaire is one of the chief inspectors of the architectural work of the city of Paris. The two first medals were awarded, one to M. Jacques Hermant for his scheme for the Caserne des Celestins, the other to M. Louis Louvet for his designs for a Musée des Arts Décoratifs. M. Hermant was a pupil of M. Vaudremer, and M. Louvet pupil of M.

Gainin. Second medals were awarded to MM. Henri Legrand, Thibouan, and Louis Grandin. There are also a large number of third medals and honourable mentions. In the section of painting the votes were first divided between MM. Gabriel Ferrier, Henri Martin, Wencker, and Bail, but as after further voting none of these artists carried off the necessary majority of votes, no medal of honour was awarded. In the section of sculpture there was no medal of honour awarded, the votes remaining divided between M. Soulé and M. Bequet. In the section of engraving the medal of honour was awarded to M. Mougin, who exhibited an engraving of "The Baptism" after Sadler.

A large number of well-known architects and builders have sent in the following petition to the Senate, protesting against the passing of the proposed law disestablishing the congregations of religious orders and forbidding future unauthorised religious societies and institutions:—"The religious orders of past times have covered France with monuments which are our national glory. The religious societies of our days have raised buildings which are sometimes remarkable, and are always useful to our country, being generously open to the poor and suffering. Every day some new charitable work created by them necessitates new buildings and procures to the whole building corporation and to numerous workmen a considerable amount of work and employment. Full of gratitude and admiration to a past as glorious to French architecture as useful to the country, and reasonably counting on a future not less glorious and profitable to the large army employed in building work; considering the irremediable wrong which the even partial destruction of religious congregations would do to art and construction; we, the undersigned architects on one side, and builders on the other side, petition you to suppress the scheme of the law of associations of which the terms are so unfavourable to religious congregations."

M. Redon, the architect of the Louvre, is now occupied in rearranging the nine large rooms on the first floor of the north wing of the Cour du Louvre for the future installation of the museum of the drawings of old masters, portions of which have been ousted from their places in the five new rooms recently installed and devoted to the museum of furniture.

The subject for the annual Concours Lalbarré at the Ecole des Beaux Arts, was "A Palace for the People." The building was to comprise all the services which would enable the working man to usefully employ his leisure, procure for him the various advantages of co-operative societies, the means of instructing himself, and providing him with every information on questions or events interesting to him. The building was to contain on the ground-floor large stores and shops on the co-operative system, reading-rooms for periodicals, café with billiard-room, large co-operative restaurant, bath establishment, a popular theatre, garden with gymnasium, and a large hall for children's recreation. On the first floor a large library of instructive works, two conference halls, an exhibition hall, and a museum of work to contain models and works of art and industry. On the second-floor a number of small rooms for letting to bachelor workmen, meeting-rooms, and the various offices. The ground was an isolated one of a surface of 5,000 square metres. The Prize was awarded to M. Etienne Coutant, pupil of the atelier Pascal.

On the 19th ult. took place the unveiling of the monument raised at Fontainebleau to the memory of Mme. Rosa Bonheur. The monument is due to the generosity of M. Gambart, Spanish Consul at Nice, a great admirer of the artist and her work. The monument is very simple in style, being composed of an oblong pedestal of Lorraine stone, ornamented with a bronze bas-relief on each side, one a portrait of the late artist, the three others representing reproductions of three of her best-known pictures: "The Horse Market," "The Plough," and "The King of the Forest." On the pedestal is placed the bronze figure of a bull, an enlargement of a model from the hand of the artist herself. The architect is M. Jacob, Architecte des Monuments Historiques.

Next session the Municipal Council of Paris will have to consider, among other important matters, the best way of utilising the Petit Palais. Two schemes are before them: one to consist of a permanent exhibition of ancient art, subject to continual additions. The objection to this is that exhibitions of this

class are already provided for in the Cluny and Carnavalet Museums and at the Louvre, and that we hardly want another. The second scheme, which seems to be the popular one with the Council, is to make of the Petit Palais a sort of municipal Luxembourg, in which will be collected all the objects of art now scattered among the various municipal buildings, and in the repository which the Service des Beaux-Arts possesses at Auteuil. This would form a museum analogous to those in other great towns both in France and abroad; the municipal collection, which is enlarged every year by the purchases made at the Salons, is already rich enough to offer to the public a fine gallery of pictures, marbles, bronzes, tapestries, &c. It is a matter of some interest to Paris to know how this will be settled.

In the meantime the Service des Beaux Arts is organising at the Galleria Museum an exhibition of objects of industrial art, which will probably have some success. Among the things to be included in it are pewter-work by Baffier and Desbois, enamels by Touretti, jewellery by Verbon and Lalique, furniture by Carabin and Lambert, and works by Alexandre Charpentier, &c. This exhibition will be repeated periodically, and will put this beautiful but small building to a better use than has hitherto been found for it.

The Municipal Council will also have to consider in a few days the subject of the new metropolitan railway lines. The only line completed—that from Vincennes to the Bois de Boulogne—has been of such public service that the Town Council are desirous to complete the whole service as soon as possible. Besides the public interest, however, there is a financial bait in the matter, since the railway company is to pay to the City of Paris a rent of '05 centimes per traveller carried, which means a daily revenue of 20,000 fr. to 25,000 fr. for the municipal coffers; so that the Municipality are not only anxious to finish the proposed line, but even to lay out a new one. This latter is proposed to be from east to west of Paris, between the artisan quarters of Menilmontant and the wealthy neighbourhood of the Pleine Monceau, with branches into the business quarters of the Bourse and the Rue du 4 Septembre.

There is much talk at present of the injury done in various ways to the natural beauties of the country. A society has been formed, analogous to that of the Monuments Historiques, the object of which will be to protect forest trees from destruction, and to put a stop to the constant disfigurement of the landscape by the immense advertisements which are now found perpetually along all the railway routes, whether one travels towards the Pyrenees, the Vosges, or the Alps. Messrs. Beauquier and Dubuisson are about to submit to the Chamber of Deputies formal proposals for the official protection of landscape, and we are all hoping that Parliament will be able to do something definite to put down this commercial vandalism.

At the Ecole des Beaux Arts the *ateliers* open for female students have already given most excellent results, and in the section of painting a lady, Mlle. Hevelmans, has obtained a *troisième médaille* in anatomical drawing.

The architectural profession in France has suffered a great loss by the death of M. Gaston Cousin, one of the architects of the Alexandre III. bridge, and a former vice-president of the "Société des Architectes Diplômés," who has died, after a very short illness, at the age of forty-two. M. Cousin was a pupil of MM. Coquart and Gerhardt. On leaving the Ecole des Beaux Arts he entered on the architectural staff of the opera house, under Charles Garnier. In 1893 he took part in the competition for the Opera Comique, and his design, made in collaboration with M. Cassien-Bernard, obtained fifth premium, and the same two architects obtained the second premium in the competition for the Petit Palais. It was in consequence of this that the Government appointed them architects for the Pont Alexandre III., for which each of them received the Cross of the Legion of Honour. M. Cousin was also commissioned to design the Swedish pavilion in the great Exhibition. His early death, following upon that of Adrien Chancel, is a serious loss to the Société Centrale.

ELECTRIC LIGHTING AND PUBLIC BATHS IN LIVERPOOL.—Application has been made to the Local Government Board by the Corporation of Liverpool for sanction to borrow 300,000l. for the purposes of electric lighting, and 24,000l. for the provision of public baths.

WORKS IN WOOD AND WOOD-CARVING AT THE CARPENTERS' HALL.

THE exhibition at the Carpenters' Hall this year is an interesting one. It is typical of both the strength and the weakness of the English building trade, so far as it rests with the carpenters and the carvers. No country in the world, probably, could make such a good show of its carpenters' and joiners' work. In this class the exhibition is confined of necessity to models which from the point of view of execution come more under the title of cabinet-making. The majority have no scale attached to them. They are readable and skillful exercises in construction, explained where necessary by large details of the more important sections, fitted together with such precision that screws or glue are unnecessary, and the visitor may take them to pieces and fit them together again like a Chinese puzzle.

It is unfortunate that the scale is so often omitted; without it there is nothing to indicate whether or not the workman is aware of the scantlings of his timbers, in which case the model he has spent so much time on loses one of its greatest educational values. The model of a hip roof for slates, to a scale of 1½ in. to 1 ft., by Mr. A. Norton is a most complete and workmanlike model. If an architect, during his apprenticeship, were set to such a task, he would learn once and for all that was possible for him to know of a hip roof for slates. Good, also, are the Mansard roof trusses by Mr. E. F. Lay. A model by Mr. J. Colburn of centring for a masonry arch of 150 ft. span has been awarded first prize and special gold medal as the best exhibit in its division. It is a fine design and a fine piece of work, executed with singular patience and exactness. A problem of more abstruse mathematical calculation, if less fatiguing in execution, is the model of vaulting by Mr. W. E. Saunders, an apprentice. The model shows the intersection of two barrel vaults, the centre line of one of which is a curve, while the other vault tapers from a greater to a less diameter; such a problem as you would get in roofing an aisle round the semi-circular apex of a church. Such a problem nowadays would be solved probably by not using barrel vaults, which, in a Renaissance building at least, would be supplanted by a saucer dome. It is, however, an interesting exhibit and well deserves the prize and gold medal awarded it. Of three models for a circular staircase the first prize is taken by Mr. S. Savill; the award was probably influenced by the economy of material and space effected in this design by the shallow depth of the stair and soffit, and by the clever cutting of the miniature handrail, which finishes with the old-fashioned curve without a newel head. In other respects the model by Mr. H. Treais, which wins the second prize, is a superior piece of work.

From these thorough and able exhibitions of skill we turn with something like despair to the furniture and wood carving. So much skilled labour in artistic hands should lead to valuable results; as it is, our labour in this direction is mostly only so much encouragement to showy vulgarity. It is no exaggeration to say that no single piece of furniture, from the point of view of design, is fit for the house of an educated person. Compare the chairs with the beautiful examples of old work lent for the occasion by South Kensington. No craft can have suffered more during the last 100 years than that of furniture-making, mainly because of the separation of the operative from the designer. When we see the operative left to himself and his foreman, his productions are pitiable. In the wood-carving classes the same lack of thought and tradition is noticeable. Unlike our forefathers, or the Japanese or the Italians at the present day, the English wood-carver only does well when he is copying or working from other people's designs. His attention is entirely absorbed by the details, the more variety in which the better he is pleased. He can undercut to perfection; indeed, the best piece of carving in the present exhibition is a study after Grinling Gibbons carved from the solid block by Mr. C. Milson, and is a remarkable work. Mr. W. M. Barnes wins the gold medal and first prize with a group of three exhibits, the principal of which, a "carved walnut casket," is an attempt at design rather in imitation of the clever work of Mr. George Frampton, A.R.A. The design is much more suitable for metal than wood, as, indeed, the title "casket" at once suggests; it is decorated with some clever carved boxwood panels in-

laid, but the less prominent inlays are merely a smearing of wax which spoils it all.

Two hand mirrors by Mr. J. Osmond are very good, as also is a carved oak panel for a door by Mr. J. Phillips, which by contrast is a strong design. Among the loan exhibits, which alone would make the exhibition worth a visit, are two beautiful little panels of the period of Francis I.; a carved pilaster, probably the work of a living Italian, a marvel of minutely skillful execution; two boxwood carvings of cupids laid on a dark plain background, and two pilasters by Noci, lent by Messrs. Gillow & Co.; and of modern English work, a case of little fragments by Mr. G. H. Bull, the gem of which collection is a single spray of acanthus foliage.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A GENERAL meeting (business) of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, Mr. Wm. Emerson, President, in the chair.

The late John McKean Brydon.

The Chairman said that there had been many gloomy announcements to make from that chair during the last year or so of losses which had befallen the Institute by the death of distinguished and respected members, but he thought there had been none sadder than that which it was his duty to mention that day—viz., the loss of their friend and Vice-President, Mr. John Brydon. When a man died full of years and with his work carried out to completion, one felt that his life had seen a fitting ending; but in the case of Mr. Brydon, and in that of Mr. William Young, who died a few months ago, both of whom had made the designs for the largest work they had ever been employed upon, before they could even lay one stone they had been called away. He would ask that an expression of their sorrowful regret for the loss they had sustained be recorded on the minutes, and that a letter of sympathy and condolence be forwarded from the Institute to Mrs. Brydon, his widow.

Mr. Aston Webb, A.R.A., said he was sure they all felt with the President the gloom and solemnity of the occasion. Death had been very present with them lately. At their last meeting it was Arthur Cates; at the present it was John McKean Brydon. They might almost use the words of John Bright on a memorable occasion, "The Angel of Death is present amongst us; you can almost hear the beating of his wings." John Brydon, whom they all knew so well, was so keen, so alert, so genial, and so kindly, that it seemed almost impossible, even for those who saw him laid to rest the other day, to realise that he would never sit in his accustomed place on those benches again. He was a man of strong opinions, and a man who did not shrink from expressing them strongly; but he also had the feeling of give-and-take which was necessary to the carrying on of the work of this life, and he never pressed his opinions beyond what he was entitled to do. As an architect he strenuously advocated breadth and simplicity in architecture, and in his work he endeavoured, and to a great extent succeeded, in carrying out those principles. He (the speaker) had not the privilege of knowing Mr. Brydon as intimately as some of those present, but he knew that when he first came to London his life was not free from struggle and almost hardship. As a man, sorrow and bereavement had fallen to him, perhaps somewhat more than to the average man amongst them; and as at last he grasped the prize it was most pathetic and almost tragic to think that he himself was snatched away and that the prize was to fall to another hand. It made them feel with Burke, "What shadows we are, and what shadows we pursue!" The present was not the time and he (the speaker) was not the man to give a critical notice of his work, or of Brydon as a man, but it was a time for them to express their great regret and sorrow that they should never see him there any more. It was also fitting and right that they should convey to those dear to him whom he had left behind their sincerest sympathy and condolences with them in the great loss which they had sustained, which they his brethren had sustained, and which the Royal Institute, which he had served so long, so faithfully, and so well, had sustained.

Mr. John Belcher, A.R.A., said that the death of Mr. Brydon had come as a great blow

to every member of the Institute, not only because they were not acquainted with his illness, and were not aware that he was seriously ill, but because he was one whom they felt they could ill afford to lose. He was a most conscientious artist, working always on quiet and safe lines. He hated meretricious ornament and highly favoured that which was dignified and monumental in their art. In those respects he set a good example to most of them. But especially did he set them a good example in the interest and affection he showed for the Institute, of which he was so staunch a friend. He never lost an opportunity to favour the Institute and to do what he could to advance its interests. He was also one who assisted greatly the younger members of the profession, both by his interest in them and by his kindly counsel and encouragement. He was, as Mr. Webb had said, a genial companion and a good friend. The members of the Council would long mourn their colleague; he was always so energetic and ready with good and sound advice and practical assistance. There was much more that could be said about his friend Brydon, but their duty that evening was to express their sympathy with his widow and family in their deep sorrow, and the vote which had been moved had his sincerest support.

The vote, having been put from the chair, was passed in silence.

The following gentlemen were then elected:—As Fellows: Messrs. J. C. Hall, London; H. B. Measures, London; E. H. Pritchett, Swindon; and N. Y. Armstrong Wales, Dunedin, New Zealand. As Associate: Mr. J. A. Minty, Leyton. As Honorary Corresponding Member: M. Sainte-Marie Perrin, of Lyons.

The following officers were declared duly elected for the ensuing year:—

President.—Mr. William Emerson.
Hon. Secretary.—Mr. Alexander Graham, F.S.A.

Vice-Presidents.—Messrs. John Belcher, A.R.A.; T. E. Colcutt; and John Slater, B.A.Lond.

Members of Council.—Messrs. F. T. Baggally; G. F. Bodley, A.R.A., F.S.A.; W. D. Caröe, M.A.Cantab., F.S.A.; W. M. Fawcett, M.A.Cantab., F.S.A.; Ernest George; J. A. Gotch, F.S.A.; Kettering; G. E. Grayson, Liverpool; E. A. Gruning; E. T. Hall; H. T. Hare; E. W. Mountford; Professor Beresford Pite; G. H. Fellowes Prynne; P. G. Smith; Leonard Stokes; R. Phené Spiers, F.S.A.; Paul Waterhouse, M.A.Oxon.; Aston Webb, A.R.A., F.S.A.

Associate-Members of Council.—R. S. Balfour; W. H. Bidlake, M.A.Cantab., Birmingham; J. S. Gibson, H. V. Lancheater.

Representatives of Allied Societies.—J. J. Burnet, A.R.S.A., Glasgow Institute of Architects; Frank Caws, Northern Architectural Association; C. H. Chiannon, York Architectural Society; A. Clyne, Aberdeen Society of Architects; Sir Thomas Drew, P.R.H.A., Royal Institute of the Architects of Ireland; F. H. Oldham, Manchester Society of Architects; S. P. Pick, Leicester and Leicestershire Society of Architects; F. W. Wills, Bristol Society of Architects; Butler Wilson, Leeds and Yorkshire Architectural Society.

Representative of the Architectural Association (London).—Mr. W. H. Seth-Smith.

A vote of thanks to the scrutineers was carried by acclamation, and the meeting terminated.

The next meeting will be held on Monday, June 17, when Professor W. R. Lethaby will read a paper on "Education in Building."

THE INCORPORATED GAS INSTITUTE. — The thirty-eighth annual general meeting will be held at the Royal United Service Institution, Whitehall, London, on Tuesday (10.30 a.m.); Wednesday and Thursday (10 a.m.), June 11, 12, and 13, under the presidency of Mr. T. Ormiston Paterson, M.Inst.C.E., who will deliver an address at the commencement of the proceedings. A lecture on "The New Table Photometer and Pentane Ten-Candle Lamp" will be given by Professor Frank Clowes, D.Sc., and the following papers will be read and discussed:—"The Effect of Quality and Pressure of Gas on the Efficiency of Incandescent Gas Lighting, having regard to Economy," by Mr. W. Grafton, of Beckton; "Why I Adopted Water Gas," by Mr. William Langford, of Longton; "British Water Gas Practice," by Mr. Robert Porter, of Elland; "Self Intensifying of Gas Pressure by Means of Waste Heat," by Mr. C. Scott-Snell, of London; "High and Low Pressure Gas Incandescent Lighting," by Mr. William Sugg, of London.

THE ARCHITECTURAL ASSOCIATION: ANNUAL DINNER.

The annual dinner of the Architectural Association was held on Friday evening last week at the Criterion Restaurant, Piccadilly Circus, the President, Mr. W. H. Seth-Smith, occupying the chair, supported by Mr. William Emerson, President of the Royal Institute of British Architects; Mr. A. W. Soames, M.P.; the Rev. H. Russell Wakefield; Rev. Dr. G. H. West; Major-Gen. Sir H. Trotter; Sir George Young; Dr. Isambard Owen; Dr. W. J. Collins, L.C.C.; Professors F. E. Hulme, T. Roger Smith, R. Eley Smith, V.P., and F. M. Simpson; the Master of the Plumbers' Company; Mr. Aston Webb, A.R.A.; Mr. R. M. Beachcroft, L.C.C.; Mr. G. L. Gomme, Clerk to the L.C.C.; Messrs. F. T. Baggally; R. S. Balfour; J. H. Colls; G. B. Carvill; E. Guy Dawber; W. E. Davis; A. Hands; H. T. Hare; Reginald Hart-Dyke; Francis Hooper; W. G. B. Lewis; W. J. Locke; A. E. Murray; F. W. Pomeroy; E. S. Prior; H. A. Satchell; R. W. Schultz; J. Osborne Smith; John Slater; H. Tanner, Sen.; Clyde Young, and others.

The toast of "The King and Royal Family" having been honoured,

The Chairman proposed "The Church and Legislature," coupled with the names of the Rev. H. Russell Wakefield and Mr. A. W. Soames, M.P.

The Rev. H. Russell Wakefield, in response, said that enough care was not taken now as formerly in the erection of church buildings. It was not because there was not the artistic power to design beautiful buildings such as were erected in former days, but because money was not forthcoming for the purpose. There was something inspiring and stirring in the sight of a beautiful church or cathedral, and clergymen preached better sermons in such beautiful surroundings.

Mr. Soames also responded. He said that the House of Commons was more representative of the many classes of the country than it used to be, but, unfortunately, art was very slightly represented indeed. That was probably a reflex of the attitude of the nation at large towards art. If there were greater appreciation of art in the country there would be more representatives of it in the House of Commons. Architects and artists (the spoke as an architect) did not receive much assistance from the Government, but in some Continental countries great opportunities were given to artists: public buildings were decorated with grand schemes of decoration; sites carefully selected for buildings, and money lavishly spent. Such encouragement art in this country had seldom had. It had been said that the interests of art would be better served if there were a Ministry of Fine Art. He thought that that would be a case of exchanging King Log for King Stork, and that it would not be entirely an advantage to artists. There had been a decided improvement in the manner in which recent Governments had treated art questions which had come before Parliament. For instance, he thought the plan adopted in regard to the new public buildings in Whitehall was the right one, viz.: the selection of thoroughly able architects to whom were given a free hand. They must all feel deep regret at the sudden death of Mr. Brydon, whose designs for the buildings in Parliament-street were very fine, the circular court in particular being a masterpiece. It was the duty of artists to do all they could to educate public opinion on the subject of art, for that was the best way to influence the Legislature and thus get a more satisfactory attitude of Governments towards art questions. It rested very largely with artists to bring about an appreciation of what art really meant—it could not come from those who were not artists themselves.

Mr. John Slater then proposed "The Army and Navy," coupled with the name of Major-General Sir H. Trotter. He said the connexion between the Army and architecture was not quite so remote as might be thought, for the War Office had a very great work to do in providing barracks, stores, and other buildings for the accommodation of the Army, and there were several members of the Association and the Royal Institute of British Architects who were engaged at the War Office doing that sort of work. In regard to one man who had his training in the War Office, it could be said that, in conjunction with their friend and colleague,

Mr. Aston Webb, Mr. Ingress Bell had attained a very high position in architecture.

Major-General Sir H. Trotter, in the course of a suitable reply, said he must congratulate the artists on the excellent volunteer art corps under Colonel Edis. The artists had done splendid work at home and splendid work in South Africa.

Mr. F. T. Baggally then gave "The Royal Academy and the Royal Institute of British Architects." These two bodies were subject to a good deal of sporadic criticism amongst architects, but he thought it would be hard to find bodies of men who would do the work these two bodies undertook in a better way. There were many architects who owed much to both bodies, and few who did not owe much to one or the other. There were many architects who had had their first insight into the æsthetic side of architecture in the Academy School, and there were many others (he knew it was rather a delicate point, but he said it with conviction) who had had their first insight into the breadth of architecture and the ground it covered by having to prepare for the Institute examinations. With the toast he coupled the names of Mr. Aston Webb, A.R.A., and Mr. William Emerson.

Mr. Aston Webb, in responding for the Academy, said there was one subject which the Architectural Association and the Royal Academy had equally at heart, and that was the subject of education. Among the thousands who thronged the picture galleries at Burlington House at the present time, probably very few remembered or knew of the silent work which was carried on under their feet, i.e., the education of those young men and women whose ambition it was in future time to hang their works in those galleries. The Association in the same way was very much concerned in the education of young men, and, in fact, was just starting a new scheme. He was one of those who did not believe that a scheme of education would produce good architecture of itself, but he was confident that architecture must be founded on knowledge, and he did not think that any one present that evening who agreed that knowledge was power would deny that that applied to architecture as well as to other arts or sciences. There might be a danger in so many bodies starting some architectural course, and he believed that if they could be concentrated to some extent they would be more likely to do good. Two or three strong, well-attended classes were likely to do far more good than twenty feeble and sparsely-attended classes. He would like to see the educational scheme of the Association and the educational scheme of the Royal Academy working on harmonious lines. The work of the Association was perfectly elementary; the work of the Academy was of a more advanced type, because the Academy did not admit students until they had arrived at a certain stage of proficiency, and it should be one of the objects of the Association to bring pupils up to that stage. Students should remember that with all schemes of education success in life depended upon themselves, and that without energy and great sacrifice they would not achieve success. He sometimes thought it would be fortunate if centres of education could be farther from pleasure-loving London, but in any case they must be prepared for sacrifices in order to achieve their work.

Mr. William Emerson, President of the Royal Institute of British Architects, said he thought such social gatherings had considerable influence for good on the future of architecture—partly by bringing into harmonious intercourse with each other men who did not generally meet (leading to the interchange of views on many subjects), and also by the encouragement that one man gave to the other in the interests of art and architecture. As to the new educational movement started by the Association, it was worthy of all commendation, for however much one might study individually, study in a school was requisite to enable a man to arrive at a proper knowledge of the art or business he followed; and without study and without the knowledge that could be obtained only by study, architects could not arrive at that facility of expression in design and the expeditious mode of working which were absolutely necessary for a man who had a busy professional practice. Of course, architects needed not only to work quickly if they were busy men, but to work thoughtfully; but however much thought they put into their work, if they could not work fairly quickly they

would be left behind in the race. In thinking of this facility of work in art, he had been reminded of a story about Donatello, who was asked once by the Council of Florence how much he would make a certain statue for. Donatello said fifty crowns, which the Council thought was too much, and they gave the work to another and less accomplished sculptor, who charged eighty crowns. The Council declined to pay, and a hot dispute took place. The matter was referred to Donatello, who awarded the other sculptor seventy crowns. This surprised the Council, who pointed out that Donatello was ready to do the work for fifty crowns, and yet he had awarded an inferior artist seventy crowns. Donatello's reply was that he could have done the work in a month or less, and fifty crowns would have paid him well, but that the other sculptor, having taken very much longer to do the work in consequence of his incapacity, seventy crowns was not too much to pay him. He (the speaker) did not mean that the work done in the most expeditious way was necessarily the best, but facility in the execution of work was a great advantage to a man, and it was only obtained by constant study and practice. In addition, an architect had to exercise very considerable forethought and care in his work, which might be either a lasting honour to him or a standing reproach. He could quite enter into the feeling of the painter who changed his profession and became a physician. When asked why he had done so, the physician said: "When I was a painter, I found my work was exposed to the sneers and gibes of every critic, and a great deal of my work was a constant reproach to me; but when I became a physician, I found that the unfortunate sufferers of my blunders were buried, and then they never rose to reproach me later on." Some architects must be sorry they could not bury their work; but that they could not, showed how great was their responsibility. After what the Rev. Russell Wakefield had said about better sermons being preached in beautiful churches it might almost be said that architects won souls by proxy—by building beautiful churches. That was an encouraging thought for church architects. The movement of the Association in starting, in the energetic way it had, the new classes for study was a movement in the right direction, and it would probably result in some lasting benefit to the art of architecture, and in achieving that the Association would be working on all fours with the Institute; in whose charter it is stated that it was established for the sake of fostering the art of architecture. That was what the Association was doing by extending advantages to students in the way of education.

The next toast was "The London County Council," which was ably proposed by Sir George Young, Bart. They had heard that the Church provided a fine field for architects; no one could deny that the State, with its infinite resources, also did so; and behind them both there was the public, who gave architects their opportunities. Another great field for the architect had been those municipalities of the Middle Ages which on the Continent (especially in Belgium, Germany, France, and Italy) had erected great municipal buildings—things of beauty, joys for ever. We in England had created great municipalities, the London County Council being the latest and biggest of them, and it remained in the womb of time whether it should be the greatest. The work it had done so far was mostly of an humble character, and did not at present greatly attract the eye. The work the Architectural Association was doing at Great Marlborough-street had been largely helped by the courtesy and good sense of the London County Council in granting students access to the County Council schools in Regent-street, where students had a chance of learning practical handicraft work in the excellent classes there. No great work could be done by a public body for the good of the public unless it was not only useful, but appealed to the imagination. In appealing to the imagination, a public body acquired that confidence of the public which was so useful and which enabled them to do great things. The London County Council were about to make a great street through one of the unloveliest parts of London, and he hoped they would do something in the direction of an appeal to the imagination. He was glad that the Council had decided to preserve the churches in the Strand, but in the new street itself they would have large frontages to dispose of, and they would be able to

impose their own conditions. We were apt to think that it was best to exercise economy in such matters, but he hoped that when the conditions were settled for building in that new street that they would be settled under artistic guidance, and that an attempt would be made to make the new street a credit to London. If that were done—if something should be produced which was not merely big, but fine—the County Council would hear very little more of that criticism which had been bestowed upon them. He trusted that the new movement in architecture, which had resulted in the erection in some of our streets of buildings which excited admiration, would be extended to something more of a system. The art of architecture was one thing; the business of it was another. To keep them distinct and yet to bind them in a perfect synthesis was the work of a body like the Association, and it was to be hoped that architects would find patrons as intelligent as were those of the Middle Ages, when those beautiful buildings were erected—churches and buildings of State—which were now visited and admired by people. There was no reason why London should not be beautiful as well as vast and opulent, and it was for architects, assisted by the County Council, to make it so.

Dr. Collins, L.C.C., in response, said it might be asked what there could be in common between a profession like the architectural profession and a body such as the London County Council, which was so modern, so matter of fact, so prosaic and so mundane. At any rate there was one common ground upon which the Council and the Association met, and that was in endeavouring to study that masterpiece of legislation, that consolidated simplicity which consisted in the London Building Act. He had only to allude to Sections 8 and 41 to carry that assembly with him when he said that we are fearfully and wonderfully legislated for, and that the London Building Act is a mighty maze, although he believed it was not entirely without plan. In listening to Mr. Emerson's remarks, especially as to burying defective work, he thought there were other analogies between the two professions. He believed it had been said that the ancients tried to make medicine a science and failed, and the moderns had tried to make it a trade and had succeeded. He hoped and trusted that there was no analogy of that sort between the practice of modern architecture and the ideals of ancient architecture. He understood that before the formation of the Association in the middle of last century the equipment for an architect considered necessary then was to have the run of an architect's office. He always regarded that expression as analogous to "walking the hospitals." Both professions had recognised that it was absolutely essential to engraft upon that curious mode of acquiring knowledge some kind of school education, some kind of steady practice, something of that kind of work done in the Arts and Crafts School founded by the Technical Education Board, which had provided some useful opportunities for study to members of the Association. He thought there was an educational relationship which might be usefully established between the municipality of London and the architectural profession, and he regretted that the architectural profession was not represented on the reconstituted Senate of the University of London. The profession which appealed to the harmony of the ear had a faculty all to itself, while the profession which represented the harmony of the eye was not represented. He hoped that a closer identity would be established between the profession and the University. He agreed with what had been said as to the relationship between the arts and the municipality in the Middle Ages, and he hoped that in time there would be a similar relationship between the two. The Council was oppressed by the wealth of London and its power and energy, as well as by its poverty, misery, and ugliness, and to redeem that ugliness they largely looked to the architectural profession.

Mr. W. J. Locke then gave the toast of the Architectural Association. The present year must be marked with a white stone in the annals of the Association as being the year in which they had taken the most important and decisive leap towards progress in their history, *i.e.*, the establishment of day classes in the Association. They had risen from a lower rank to a front rank among educational institutions; and the advance had been steady and certain; and

having overcome many prejudices, they stood the premier body for architectural education in the country, with dreams of premises of their own within sight of realisation. He congratulated the President and the committee on having brought to a successful issue a scheme to which had been devoted so much loving pains and an enthusiasm based on such a clear knowledge of the needs of the profession, for whatever false prophets might say, an academic training was a vital necessity for the pursuit of any art or any profession—whether it be medicine, painting, letters, or architecture. He knew two men of distinction in letters who recently greatly deplored their want of academic training in their youth, that lack of systematic education in thought and expression such as could be attained only by the study of classical methods and models. What was true of letters was true of architecture. This academic education which it was the province and privilege of the Association to give was of the most supreme importance, and the efforts about to be made would be watched with the keenest interest by all those who were concerned in the improvement of the art of architecture. With the toast he coupled the names of Mr. H. T. Hare and the President.

Mr. H. T. Hare, in reply, said that the Institute and the Association were complementary to one another and each was indebted to the other in its own way. The Institute looked to the Association for its future members (it was already indebted to them for many most distinguished members) and it looked to the Association to give such educational facilities to young architects as to prepare them to become in the future members of the senior body. The Association was indebted to the Institute for many specific favours and it looked to the Institute for a continuance of its support, without which it would hardly be able to carry on its work, *i.e.*, the education of architects, especially at the present time when it was taking that important step, perhaps the most important step it had ever taken, *viz.*, the establishment of day classes. Every one, he believed, agreed that the study of architectural education at present left very much to be desired. There was an entire want of system and method and everything appeared to be left to chance. A young man was articled to an architect—was almost pitchforked into the office, it might be said—and obtained "the run of the office," picking up what small crumbs of information he could and at the end of four or five years he probably knew very little more than he did at the time he was articled. The architect was not altogether to blame, because, in the midst of a busy practice it was manifestly impossible for him to devote time to the teaching of his pupils; it was consequently left to the men of the office. It was to remedy this state of things that the Association had established the day classes. The Association wished to give a young man an opportunity to prepare himself to enter an architect's office by teaching him in a methodical and systematic way the A B C of the profession. This would obviously be to the advantage of the student, and it would also be to the advantage of the architect, for from the day the student entered the office he would be useful and capable of considerably helping the architect. The committee were perfectly well aware that other bodies had established schools more or less on the lines the Association proposed to institute them, but it was thought that the Association was better qualified to direct such a school than any other educational body. The organisation of the scheme had exercised the minds of committees of the Association for several years, and a very large amount of consideration had been given to the matter in order to organise the school on a most satisfactory basis. A large number of eminent architects had been consulted, and had placed their advice at the disposal of the Association. The committee believed they were instituting the school on such a basis as would render it of permanent benefit to the profession.

The Chairman also responded. He desired to refer to the death of one or two very distinguished members of the Association, whose loss every one would lament. One was their friend and benefactor, Mr. Arthur Cates, who, only a few months ago, promised 25*l.* to the new premises fund. Only last year Mr. Cates rejoined the Association, paying thirty-four years' subscription in order to do so; and last year he gave them the chairman's hammer—one of those little marks of his kindly feeling towards them. Mr. Cates was honorary secre-

tary of the Association for some years. Another great loss they and the profession had suffered was the unexpected death of Mr. J. M. Brydon, who was on the Advisory Council for the Day School, and was one of the Visitors to the Class of Design. His kindly sympathy and tact in criticising drawings of the students was remarkable. Mr. Brydon was a most popular Visitor, and whenever his name was down for a subject he was sure to have a room full of students. The Association also had to regret the loss of Mr. William Young, who (as did Mr. Brydon) promised very substantial help to the premises fund. It might interest the company to know that the Association had had fifteen of its members in the war in South Africa—mostly Volunteers—and three of them had been lost, while one was dangerously ill. With regard to the scheme which the Association had on hand, they were conducting their educational work on lines which were thoroughly characteristic of England. We were slow to move, but we were proceeding in a scientific way—namely, by experiment, and refraining from adopting any foreign model wholesale. It might be said, "Why should the profession undertake the teaching as well as the examination?" He thought it was a wise plan to do so. Who but architects could know thoroughly the needs of young men training to be architects? It was consequently felt that the training should be kept in the hands of architects. In regard to new premises for the Association, the Committee had the matter deeply at heart, and he felt confident that during the next year a site would be found and a scheme would be before them, which it was hoped, they would subscribe liberally to.

Professor F. M. Simpson proposed the toast of "Lecturers and Instructors." Any one who attempted at the present time architectural education in London laboured under great disadvantages. Architectural education was in its infancy and whether or not the new scheme of the Association would succeed he could not say. If they compared the way in which architectural education was managed in Germany in the big polytechnics, and in America in the big university colleges, and if they thought of the collections of casts, drawings, photographs to be found in those imposing buildings, and of the large staff of instructors—of everything, in fact, which could help and assist architectural education, and then thought of the premises of the Association in Great Marlborough-street, he thought they would agree with him that in London (and the whole of England) any one who attempted architectural education laboured under great disadvantages. Any scheme which was started should be on such a scale that it would command absolute respect from everybody who was interested in this important subject. The lecturers and instructors had laboured earnestly in the cause of architectural education, and it was a fortunate thing for the Association that it had been able to command such good men. He knew of four gentlemen, and there might be others, who had been working in the Association classes from the beginning, viz., Messrs. Pomeroy, Lewis, Farrow, and Hulme. With the toast he coupled the name of Professor F. E. Hulme.

Professor Hulme, in reply, said the labours of the instructors were labours of love. In regard to the new day classes, whatever else might be wanting to make them a success, it would not be the hearty co-operation of the teaching staff.

Professor Roger Smith then gave the toast of "The Guests," coupled with the name of Mr. G. L. Gomme, who responded.

The other toasts were "The Committee and Officers," proposed by Mr. F. T. W. Goldsmith, Mr. G. B. Carvill responding, and "The Press," proposed by Mr. F. G. F. Hooper.

BUILDING IN LEEDS.—The number of plans submitted at a meeting of the Sub-Improvements (Building Plans) Committee of the Leeds City Council, held on the 24th ult., was 158. The number of houses shown upon the plans amounted to 179. Among the larger buildings represented were those of the West Riding Union Bank in Park-row, and a new Baptist chapel and schools in Malvern-road, Holbeck. Plans of the new police-station and branch free library that the Council propose to erect at the junction of Dewsbury-road and Hunslet Hall-road, as well as plans of the last of the buildings projected by the Leeds Estates Company, Limited, were also put in. The Estates Company are about to erect a public-house in Vearlane in place of the Dop-in.

THE SURVEYORS' INSTITUTION:

CONFERENCE AT SOUTHAMPTON.

The Surveyors' Institution held its country conference this year at Southampton, on Thursday and Friday last week. On Thursday the delegates had a sitting at the Hartley Institute, where the Mayor of Southampton (Alderman G. A. E. Hussey), accompanied by the Deputy-Mayor (Alderman G. J. Tilling, J.P.) and the Town Clerk, held an official reception.

His Worship, in welcoming the delegates, said he was sure it was a matter of regret to all of them that their President, Mr. John Shaw, was unable to be present that day owing to indisposition. It was a matter of congratulation to them that the President-elect, Sir John Rolleston, was able to take Mr. Shaw's place.

Sir John Rolleston, on behalf of the members of the Institution, thanked the Mayor for the reception he had given them.

The business of the conference was then proceeded with. Sir John Rolleston presided.

Mr. W. Burrough Hill, Fellow, read a paper on "Southampton, its Past and Present." Southampton 100 years ago was but a small town with possibly about 8,000 inhabitants, and now, as the preliminary report of the new census showed, it had a population of over 103,000. Southampton and district had many indications of prehistoric population, flint implements of the Early and the Late Flint Age having been discovered in the gravel beds of rivers and watercourses. An exceedingly fine and highly-finished specimen was discovered in some drainage works under his superintendence only a year or two since, and an expert in such matters gave it as his opinion that the implement probably dated from about 2000 B.C. The discoveries of Roman pottery and coins had from time to time been very numerous, but he was sorry to say that most of these relics had been sold or bartered away by the finders for a few shillings, and no carefully arranged collection had been made or preserved. He recently discovered when excavating at a depth of some few feet at Portswood, near the ancient landmark "Langhearne Gate," for the construction of roads on the Hampton Park Estate, two very fair specimens of early Roman pottery. No doubt the configuration of the whole district was altogether different in prehistoric times, and it was beyond question that Southampton possessed one of the finest harbours in England, which, owing to its position with reference to the Isle of Wight, enjoys the very exceptional advantage of a second or double tide, which practically ensured four hours of high water out of every twelve. There seemed ground for believing that Southampton existed as a British settlement in pre-Roman times, but this was little more than conjecture. The Romans doubtless first occupied the position known as Clausentum, which they made a fortified station, it being situated on a river which formed a natural highway. After some reference to the ancient history of Southampton, Mr. Burrough Hill said that Southampton was rapidly becoming a seaport of the first importance, principally owing to the enterprise of the London and South-Western Railway Company, who now owned the docks. In addition to the Empress Dock, of about 18½ acres, there was the Prince of Wales dry dock, the largest graving dock in the world. The town had many advantages, such as the parks, the magnificent Common of nearly 370 acres, with its drives, walks, cricket and golf grounds, amid beautiful gorse, fir, oak, elm, and other timber trees, approached through the fine Avenue, which all tend to make it especially attractive as a residential town as well as a seaport. The Sewerage Works, Refuse Destructor, the Electricity Works, the Electric Tram Service, the Docks, the Pier, the Ancient Walls, and many other objects of interest are all well worth a visit. The Southampton High-street, with the Above Bar-street (which was a continuation of the High-street), was one of the finest and most picturesque streets in England. In other respects Southampton enjoyed special advantages. While only about one and three-quarter hours from London, it was within a short drive of the New Forest, with its 92,000 acres of sylvan scenery of almost unrivalled beauty. The Isle of Wight could easily be reached by well-appointed steamers, and Bournemouth and Salisbury could each be reached in about an hour. Attention was called to a magnificently

carved black oak chimney-piece in some business premises in the High-street. A few years since a fire occurred at these premises, and to save it from destruction this chimney-piece was torn down and thrown out of the window. Fortunately, the fire did not reach the apartment, and the greatest pains were taken in restoring the chimney-piece and the panelling to the room, which the owner was always willing to show to antiquaries and others interested in old Southampton. The picturesque and beautiful remains of Netley Abbey and Beaulieu, on the other side of the water, were referred to, and other particulars connected with the town were alluded to.

Mr. Albert Buck (Worcester) proposed a vote of thanks to Mr. Burrough Hill for his very interesting and valuable paper.

Mr. Rees (Swansea) seconded the proposition, which was agreed to.

Mr. F. J. Smith (Chairman of the Reception Committee) then read a paper on "The New Forest." In the course of his paper he stated that to the critical eye of the scientific forester the general aspect of the Forest was somewhat disappointing. Much more was expected in the direction of scientific forestry than could, under existing circumstances, be attained. To an ordinary observer it was one of the most beautiful places on earth, presenting characteristics which could not be equalled elsewhere. Its very antiquity gave it a beauty peculiar to itself. The ancient woods and wide stretches of undulating moorland commanded panoramic views of a charming country, contiguous to, or interspersed with, the well-wooded estates of private owners; but the Forest itself was singularly destitute of those sheets of water which always imparted a special beauty to woodland scenery. The open character of the Forest and its ever-changing scenery offered facilities of great variety for landscapes—over hill and dale or between the lawns and glades; but the woods taken by themselves were not so varied and picturesque, neither of the same uniform growth, nor so grand as those, for instance, at Windsor Forest and Parks, which had the distinct advantage of water in the foreground or distance. The peculiar charm of the New Forest consisted of its old naturally-grown woods, its beeches, with gnarled trunks and many leaders; wide-spreading oaks, which for the time being retain their characteristic beauty, with the constantly changing colour of their surroundings, and of the numerous species of flora. These, together with the furze and heath of several varieties, formed a round of change during spring, summer, and autumn which it would be hard to equal elsewhere. The New Forest existed in primeval times without doubt; and it was believed to be the only relic in England of the pristine forest, where Nature had been permitted to hold her own, unaided and undisturbed by the hand of man. After some historical reference to the New Forest, its physical features, together with its geological aspect, were dealt with, and allusion was made to the modern laws dealing with the Forest, as well as to the general policy of the Crown. In his general conclusions Mr. Smith said popular sentiment had made much more of the enclosing of the forest wastes than was justified by the facts. The public always enjoyed the open spaces of the Forest, and there was no intention, so far as he saw, to enclose the Forest as a whole, nor to exclude the public, who, on the passing of the Act of 1877, gained no more than they enjoyed before in the way of liberty and recreation. But so far as preserving the ancient ornamental woods was concerned, a great loss to the public was incurred, not only as regards the ornamental trees, but the ultimate amenity and value of the national property as a whole. When those trees were gone, of what value was the property without them? By all means, he urged they should preserve and maintain the Forest by sound practical methods as a national property for the benefit of the whole community, if the beneficial interest could be equitably distributed, but where interests were so conflicting and brought into opposition, it was better to sever them and dissolve the partnership, all rights being justly compensated. Preservation of some kind as an open forest was of vital importance to residents within and contiguous to the forest as affecting their interests above those of the general public; and preservation of the open character of the forest was for the purpose of maintaining the rights of the commoners at the expense of the public, which rights were of more value to those commoners

who resided in or near the forest, as compared with those who might exercise rights attached to lands situated at a distance from the forest; and again, the public generally did not derive any advantage by reason of the open ornamental character of the forest, other than that enjoyed before or after the Act of 1877; but indirectly paid very dearly for those privileges. Not only would disafforestation save the forest to the public, but would be a great boon to the commoners, especially to small holders. The paper then referred to the necessity for establishing a School of Forestry, and the exceptional advantages possessed by the Hartley College for the purpose.

Mr. A. Vernon (High Wycombe) proposed a vote of thanks to Mr. Smith for his paper.

Mr. T. A. Dixon (Northampton) seconded the proposition, and Mr. W. Burrough Hill referred to the value of some of the rights of property in the New Forest.

The proposition was carried unanimously. Mr. Philip E. Hilditch next read a paper on "Recent Proposals for an Amendment of the Law and Practice as to Ancient Lights," which we print on another page. Mr. Horsfall (Halifax) proposed a vote of thanks to Mr. Hilditch, and the proposition having been seconded by Mr. Woodward (London) and supported by Mr. Howard Martin (London), was carried by acclamation.

An adjournment for luncheon then took place, the members proceeding to the Royal Pier at the invitation of the Mayor (Alderman G. A. E. Hussey). The Mayor presided, and was supported by Sir John F. L. Rolleston, M.P., and others.

After lunch the members returned to Hartley Institute, when Mr. Charles Pell Hall read a paper on "The Liability of Farm Fires Caused by Sparks from Railway Engines." Fires of considerable extent, involving serious losses to growing crops and plantations, were of more frequent occurrence than most people not concerned as owners or occupiers of land near a railway were aware. He suspected that many members of the Institution had practical experience of the extent of the injuries inflicted, and would be able to add materially to the available information on the subject, and testify to the necessity for the Bill introduced by Mr. Hudson and read a second time in the House of Commons this Session. Reference was made to various cases on the subject, and it was urged that the onus of proof of negligence should be placed upon the companies, instead of as now on the agriculturist.

Mr. E. Pitts Squarey (Salisbury) proposed a vote of thanks to Mr. Hall for his paper.

Mr. R. F. Sturge (Bristol) seconded the proposition, and a discussion followed, in which Messrs. French (Dublin), Jeays (Marlborough), Lynnwood, C. W. Gater (Salisbury), Bowman (Cumberland), Rees and W. E. Mills (Cheshire) took part, and the proposition was carried unanimously.

Mr. Hall having replied, the proceedings terminated.

A numerous company attended the dinner of the Institution, which took place in the evening, at the South-Western Hotel. The President-elect (Sir John F. L. Rolleston, M.P.) occupied the chair in the absence of the President, and was supported by the Mayor (Alderman G. A. E. Hussey), the Deputy-Mayor (Alderman G. J. Tilling, J.P.), Sir Barrington Simcox, Bart., M.P., Colonel D. A. Johnston, R.E. (Director-General, Ordnance Survey), Lieut.-Col. Hellard, R.E., Mr. C. J. Owens (General Manager, London and South-Western Railway Company), the Rev. Canon Durst, the Hon. Gerald Lascelles (Deputy-Surveyor, New Forest), Mr. R. R. Linthorne (Town Clerk), Messrs. A. Vernon and A. Buck (Vice-Presidents), the Hon. E. G. Strutt, and Messrs. Howard Martin, G. Langridge, and W. E. Horne (members of the Council), E. P. Squarey (Past-President), F. J. Smith (Provincial Chairman), J. C. Rogers (Secretary), &c.

The following day was devoted to visits to places of interest in Southampton and neighbourhood.

Annual Meeting.

The annual general meeting of the Institution was held on Monday at No. 12, Great George-street, the President-elect, Sir John F. L. Rolleston, M.P., presiding.

Mr. Rogers, Secretary, read the thirty-third report of the Council, which stated that the number of Fellows remains the same as last year, while the total number of members is 3,200, compared with 3,096 a year ago. The Institution has lost by death during the

year some of its oldest and most respected members, among them Mr. John Cross, of Manchester, who served on the Council of the Institution from 1890 to 1895, and took a large share in the successful launching and subsequent working of the Counties Palatine Provincial Committee; Mr. Edward Smyth, who served for thirteen years on the governing body of the Institution, and acted as unpaid examiner in one of the most difficult and exacting subjects for nearly twenty years; Mr. Jacob Wilson Fair, who served on the Council for several years, and also rendered valuable services as Provincial Chairman for his district; Mr. J. K. Fisher, of Market Harborough, who acted for several years as Chairman of the Leicester, Northampton, and Rutland Committee; Mr. T. D. Smellie, of Glasgow, one of the oldest members of the Institution in Scotland, being one of the first 150 to join it in 1868; Mr. J. W. Kemsley, and Mr. Joseph Goddard. The amount received during the year in Fellows' subscriptions was practically identical with that of last year, while the subscriptions of the two classes of associates and students show together an increase of slightly over 150l. The amount received for "hire of rooms" was about 100l. more than last year. The total investments, calculated at current prices, represent a sum of 13,724l. 19s. The support of the Benedictine Fund has received during the fifteen months since its establishment, while not inconsiderable as regards amount, is not very satisfactory as regards the number of subscribers. The amount received is a little over 7,100l., one-half of which has been subscribed by sixteen members and 74 per cent. by forty-four members, while the total number of contributors falls considerably short of 300 out of a possible 2,800.

The 362 candidates who sat for the different professional examinations in March, 1901, include fifty-three candidates who, having in a previous year passed in the examination as a whole, but failed in passing their 'typical' subject, were required, in order to complete the examination qualifying for election to the class of membership for which they desired to enter, to come up again in the 'typical' subject appertaining to their division and subdivision. The number of these candidates was, in the land agency sub-division seven, all of whom passed; and in the valuation sub-division twenty-nine, of whom twenty-one passed; and in the building sub-division seventeen, of whom ten passed. The number of candidates who, while obtaining the requisite pass marks in the examination as a whole, failed to pass in their 'typical' subject, and were therefore referred back to their studies in that particular subject, was thirty-three. As was the case last year, professional examinations were held contemporaneously with the English examinations, both in Scotland and in Dublin, adjusted as far as possible to special features of practice in those parts of the United Kingdom.

The Council ask the members to again join them in according hearty thanks to the honorary examiners, who have undertaken the onerous duty of setting the papers and awarding the marks in many of the most important subjects. Among these, outside the ranks of the Council, many of whom undertook to act as honorary examiners, special thanks are due to his Honour Judge Philbrick, K.C., Mr. E. J. Castle, K.C., Mr. J. W. Willis Bund, Mr. H. A. Rigg, and Mr. R. F. Colam, who undertook the legal papers, and Mr. F. Lee, Mr. C. John Mann, Mr. J. W. Penfold, Mr. E. B. Panson, Mr. W. Eve, Mr. Gilbert Murray, Mr. A. L. Ryde, and Mr. F. W. D. Theobald. Special thanks are also due to Mr. W. Fraser, of Glasgow, who took upon himself most of the work of organising and carrying through the professional examinations in Scotland.

For some years past the Special Certificate Examinations have fallen into abeyance, the number of candidates who offered themselves being too small to justify the expense involved. In consequence of representations that the uncertainty as to the holding of these examinations in any particular year, discouraged entries, the Council determined to hold these examinations in 1900, irrespective of the number of applications for admission, with the following result:—Three candidates entered for the Forestry Examination and three for the Examination in Sanitary Science, of whom one candidate, in forestry, failed to present himself. Of the five who actually came up, two candidates in forestry and two in sanitary science satisfied the examiners. It is hoped that this result will encourage a larger entry in future years. The examinations will be held again this year, but the Council have decided that in future they shall be held triennially.

The time has arrived when the Council are able to place the members in possession of all the facts relating to the rehousing of the Institution, and, in doing so, they avail themselves of the opportunity of recording, in the briefest possible form, the various steps taken for the purpose. Soon after the building of the old lecture-hall in 1872, it became apparent that a much more comprehensive scheme would shortly have to be considered, should the

Society continue to grow and prosper. For a time there was a prospect that the rehousing of the Institution would be effected, on favourable conditions, under clauses inserted for the purpose in the several Westminster Improvement Bills, but, after many vicissitudes, these bills came to nothing, owing to the intervention of the Government, who took the question of the widening of Parliament-street into their own hands. Early in 1894 the Council felt that action could no longer be deferred. With the growth of the membership and the general enlargement of the scope of the work carried on by the Institution, the accommodation had become totally inadequate. The lecture hall was frequently overcrowded, and the extension of the library was completely stopped for lack of shelf room, while the want of reading and other rooms for general use was much felt by the members. Negotiations were consequently opened with the Ecclesiastical Commissioners, with a view to the acquisition of the two remaining houses in Little George-street, but, on consideration, the Council deemed it advisable to carry out the larger scheme of acquiring the whole block (including the corner house, No. 43, Great George-street), which would provide a site amounting in the aggregate to a little over 6,700 superficial feet. The rents received by the Commissioners for the five houses on this site, including the two already occupied by the Institution, amounted to 1,070l. per annum, but after protracted negotiations, conducted with great skill by the late Mr. Arthur Gaward and Mr. H. T. Steward, an agreement was finally arrived at by which the Institution was to be granted the lease of the whole site for 990 years at a rental of 1,000l. per annum, subject to an undertaking to rebuild the whole block according to plans to be approved by the Commissioners. Before doing so, it was necessary to buy up the intermediate lease of the house No. 4, Little George-street, which was effected for a sum of 750l. It was evident from the sketch plans prepared by Mr. Steward for the use of the Building Committee that a great improvement in the appearance of the new building would result from the removal of the archway and superstructure which spanned the northern end of Little George-street, one-half of it appertaining to No. 14, Great George-street, and an agreement was come to with the adjoining leaseholders, under which they surrendered their interest on consideration of a payment of 500l. towards the cost of rearranging the west side of their building. . . . By September, 1895, the terms of the new lease were formally agreed upon, and designs, based upon the sketch plans prepared by the Building Committee, were invited from several eminent architects, four premiums of 100 gns. each being paid in connexion with the competition. Ultimately the designs of Mr. Alfred Waterhouse, R.A., were accepted, and immediate steps were taken to obtain tenders for the work. These varied from 31,610l. to 27,772l., the latter, that of Messrs. Foster & Dicksee, of London and Rugby, being accepted. The amount was increased later on by additional payments of 700l. in respect of the employment of a special stone of greater durability than that at first specified, and by a sum of 950l. for extra foundations, necessitated by the treacherous nature of the subsoil. The contractors undertook to complete the building in fifteen months, but owing to a number of delays arising from various causes the building was not handed over for occupation until May, 1899—two years and eight months after the signing of the contract. . . . It may be mentioned that the outlay on new furniture and fittings amounted approximately to a sum of 1,000l. It will be satisfactory to the members to know that the whole outlay has been met out of accumulated funds, and that no debt whatever remains upon the building. Everything points to the fact that the policy of rehousing on a comprehensive scale has resulted in a great increase of prestige to the Institution, while from the point of view of material advantage it cannot be doubted that it has become the owner of a property which will in time acquire a greatly increased value, owing to the growing scarcity of building sites in the City of Westminster. . . .

There have been large additions to the library during the year, and a further outlay will shortly be made on the purchase of books. There is shelf accommodation for about 15,000 volumes. The present number of volumes is, approximately, 8,000. During the year the whole of the Law text-books have been replaced by the newest editions, and many other text-books of the kind have been added to the collection. In response to a request from some of the junior members, the Council decided, as an experiment, to open the library on every week-day evening (Saturdays excepted) from October 1 to March 31. This had already been tried on two previous occasions, with not very satisfactory results. The following figures will show to what extent the younger members have availed themselves, during the past session, of the opportunities thus afforded them.

The total number of readers who have used the library during the evening from October to March was 72, of whom 35 (say half) attended once. Twelve—or one-third of the remainder—attended twice, and the remaining 25 averaged 1½ times. The average attendance during the six months was

25 per night. On 16 evenings, out of a total of 112, no one attended. The library catalogue having become difficult for purposes of reference, owing to the great number of interpolations, the whole of the manuscript portion has been rewritten, and will form, with the last printed edition (that of 1893), a complete catalogue to the collections. This is a necessary preliminary step to the republication of the catalogue, which will shortly engage the attention of the Council. The forestry collections have also been carefully rearranged and catalogued, and the Council will be glad to see these collections considerably extended by gifts of timber specimens, which the members are in such an excellent position for contributing. It may be mentioned that the two geological collections, one acquired by the Council many years ago and the other recently presented by Professor C. E. Curtis, have now, with the valuable assistance of Dr. Woodward, of the Natural History Museum, been thoroughly classified and arranged in such a form as to be of real utility to the members.

During the session the Council have promised financial support to, and have nominated two of their members (Mr. A. R. Stenning and Mr. A. Vernon) to act on, a Joint Committee of the Surveyors' Institution and the Royal Institute of British Architects, appointed for the purpose of collecting and tabulating information from all parts of the country as to damage to buildings resulting from lightning, to discover, if possible, how far buildings are rendered lightning-proof by modern systems of protection, and to ascertain what improved methods might be adopted. It is hoped that the members of the Institution in various parts of the country will assist the Committee by agreeing to act as observers, so that actual details, noted on the spot, may be forthcoming. Communications should be addressed to the Secretary of the Lightning Research Committee, 9, Conduit-street, W.

The Council also decided during the session to co-operate with the Royal Institute of British Architects on a Joint Committee with reference to the amendment of the law and practice as to ancient lights, appointing as their representatives on the Committee Mr. H. T. Steward, Mr. A. R. Stenning, Mr. H. Chaffell Clarke, and Mr. G. M. Freeman, K.C., all of whom devoted a great deal of time to the consideration of the subject. As the result of their deliberations, the Committee decided to draft a Bill for introduction into Parliament, and the Council have agreed to share (up to a certain amount) with the Royal Institute of British Architects the expense involved. The draft will come up for consideration very shortly.

The number of applications from members requiring assistants, and from the latter seeking professional employment, has been about the same as last year. The number of names at present on the register is about seventy.

The report and balance-sheet having been adopted, a vote of thanks was accorded to Messrs. H. C. Newmarch and C. P. Hall for their services as auditors.

Mr. Howard Chatefield Clarke moved a vote of thanks to the President, Vice-Presidents, and other members and Associates of Council, for the able manner in which they had carried on the affairs of the Institution.

Mr. King seconded the motion, which was agreed to.

The Chairman (the President-elect) replied and thanked the members for electing him as President for the ensuing year of office; after which Mr. Squarey, past-President, invested the Chairman with the Presidential chain of office.

A hearty vote of thanks was then accorded to Mr. J. W. Penfold, Hon. Secretary, and Mr. Julian C. Rogers, Secretary, for their services during the past year; and these gentlemen having replied, the Chairman delivered the prizes to the successful students, as follows—

The "Institution" Prize of the value of fifteen guineas was awarded to Mr. Montague Price Holmes, a "Valuation" candidate in Division II., who obtained 794 out of a possible 1,000 marks.

The "Special" Prize of the value of ten guineas was gained by Mr. Frederick Stanley Daniell, a candidate in the "Valuation" Sub-Division of Division II., with 765 out of a possible 1,000 marks.

The "Crawter" Prize, awarded for the best work in the subject "Valuations" by a candidate in Division IV., was awarded to Mr. Herbert Andrew Cromartie Warrington, who obtained 86 per cent. of the possible marks.

The "Penfold" Gold Medal was this year won by Mr. William Edward Trent, who, in the "Building" Sub-Division of Division IV., headed the list of Fellowship candidates with a total of 802 out of a possible 1,000.

The "Penfold" Silver Medal, given to the candidate who, in either Division II. or Division III., obtained the highest proportionate number of marks, was awarded to

Mr. David Llewellyn Paton, a candidate in Sub-Division II. of Division III., who also gained

The "Driver" Prize of the value of 15*l.*, awarded to the candidate heading the list in the Division III. (direct Professional Association) examination. This candidate obtained 976 out of a possible 1,200 marks.

The "Daniel Watney" Prize of 10*l.* was awarded in connexion with the Special Certificate Examination in Forestry to Leslie Stuart Wood.

For the "Preliminary" Prize Messrs. W. C. Clemens and A. Salwey were bracketed equal at the head of the list in the Studentship Examination with 468 marks out of a possible 500, and a "Preliminary" Prize in connexion with that examination was awarded to each.

A vote of thanks to the Chairman concluded the proceedings.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME Counties District Meeting of the members of the Association of Municipal and County Engineers was held at Chichester on Saturday, June 1. The members assembled in the Council Chamber of the Town Hall, where they were received and welcomed by the Mayor (Mr. R. Coombe Miller) and the members of the Corporation. Mr. C. H. Lowe (Hampstead), President, occupied the chair, and among those present were Messrs. Radford (Putney), Norrington (Westminster), Winter (Poplar), F. J. C. May (Brighton), R. J. Thomas (Aylesbury), Dyer (Southampton), Catt (Hayling), and others.

The Mayor welcomed the members of the Association, remarking that their work was of the utmost practical utility.

The President briefly acknowledged the reception accorded to the Association on the occasion of their first visit to Chichester, and said they wished to convey their best thanks to the Corporation for the use of the Council Chamber.

Mr. Thomas, district secretary, informed the members that he had received a letter from Mr. Stallard, who was at Bloemfontein, acknowledging the congratulatory message forwarded by the Wimbledon meeting on his departure to South Africa on active service.

Mr. J. Saunders, A.R.I.B.A., City Surveyor, then read a paper on "Municipal Engineering Works in Chichester." He said the question of restoring the Market Cross had been continually under discussion, and the Committee of the Council were now again considering its state and would shortly report on the matter. The Corporation owned a quay situated in the Chichester harbour, and vessels of 350 tons burden could be berthed. There was a very good trade in corn, coal, &c., and about 100*l.* yearly was handed over from the dues in relief of the borough rate. At the request of the Council, the author had prepared a scheme for enlarging the quay, dredging the channel, erecting new stores, and other works, and it was now under consideration. The Corporation also owned a navigable canal, joining the city with the Chichester harbour; it was about $\frac{1}{4}$ miles long, had two locks, and an extensive basin with commodious wharfs and storeyards on the southern side of the city. In 1890 the Corporation erected an isolation hospital at a cost of 2,230*l.*, on lines suggested by the Local Government Board.

There were two large wards, each 24 ft. by 18 ft. by 12 ft. high, and two small wards each 18 ft. by 12 ft. high, with kitchens, caretakers' house, laundry, mortuary, disinfecting rooms, &c. Previously to 1894 the city method of disposal of the sewage being by turning it into soaking cesspools. A scheme by Mr. Baldwin Latham was accepted, the sewers, nineteen miles in length, being designed to take sewage only, the surface water passing through old drains into the Lavant course.

Every house was disconnected from the main sewers by a special form of interceptor trap, having an air inlet in the pavement opposite, the far end of the drain being carried up as a ventilating shaft. A considerable number of complaints respecting these air-inlets had been received, and occasionally, during particular atmospheric conditions, the air-inlets acted as outlets, and the emanations from the house drains offended the pedestrians in the streets. In all fairness, it should however be stated that every case of nuisance arising from the grate-

ings had invariably been found to be caused by the house drains being improperly flushed. The outfall works were about a mile and a half west of the city and occupied about 10 acres of ground.

The sewage first entered a salmon ladder running the whole length of the buildings. In its course lime-water at the rate of three grains of lime per gallon of sewage was added first, to render the sewage slightly alkaline, and further down the salmon ladder alumina ferric at the rate of three grains per gallon was also added, the whole passing then through a rough screen into the precipitation tanks, of which there are three, each measuring 55 ft. 6 in. by 20 ft. by 5 ft. averaged depth. Two of these were worked each day while one was being cleaned, the sludge being pumped up by chain pumps, and lime added in a mixing pit at the rate of 1 cwt. to 100 gallons of sludge. This was afterwards forced with direct-acting pumps into sludge presses. The averaged dry weather flow of sewage was about 300,000 gallons per day, the amount of pressed cake being about 24 tons per week, and about half a ton of rough screenings per day was taken off the gratings. The tank effluent was afterwards passed over about six acres of land, laid out on the ridge and furrow system and retained in a tidal storage tank, holding about 320,000 gallons, until the tide commenced to ebb, when it was discharged. The ground had been cultivated, and last year a very good crop of mangold, cabbages, broccoli, white carrots, &c., was grown, the value realising about 80*l.*, and this about covered the working expenses. The effluent passed into the Chichester harbour through a 21-in. pipe by means of a penstock valve and tidal flap. The harbour is of great extent, and was subject to a tidal change of about 24,000,000 gallons per day.

At the conclusion of the paper Mr. Saunders appealed to the members not to discuss the sewage disposal works in any way, as the Corporation were engaged in litigation in reference thereto, and the case was coming before the Courts in a week's time.

The President promised that the members would respect the wish of Mr. Saunders, and not discuss the sewage question in any way.

Mr. Yabbicomb (Bristol) in moving a vote of thanks to Mr. Saunders for his paper, said that Chichester was to be congratulated upon having a Corporation so energetic and so appreciative of the necessities of modern life as to carry out all the important and useful works which Mr. Saunders had described. He would like to know if the isolation hospital as described in the paper had complied with the Local Government Board requirements (Mr. Saunders: "Yes."). Mr. Yabbicomb said he was interested as he was building an isolation hospital, and he considered that Chichester had a hospital built on very economical lines.

Mr. May (Brighton), who seconded, remarked that the works were so admirably explained that they did not lay themselves open to criticism.

Mr. R. J. Thomas (Aylesbury) congratulated Mr. Saunders upon the state of his roads—their condition and the smoothness of their surface.

Mr. Catt asked why the ancient city gateways had been demolished.

The President congratulated the city upon the preservation of its canals. In many parts of the country sufficient use was not made of the canals. Canal transit was cheap, if it was slow, but there was some transit where time was not an object in the bargain.

Mr. Saunders, in reply, said he believed the gateways were pulled down because their maintenance was an expense to the city. He believed the citizens in those days used to spend their money in riotous living. They could find in the old minute-books entries like this: "The Council made merry," and that was about the time the gateways were pulled down. On the coronation of Queen Anne they made the conduit-pipes which supplied the town with water run with wine.

The members dined together at the Assembly Rooms, under the presidency of Mr. Lowe, and the afternoon was devoted to a round of visits to the various public works.

CARNEGIE PUBLIC LIBRARY, KEIGHLEY.—One hundred and forty-six designs were sent in this competition, and the assessor, Mr. Leonard Stokes, has awarded the first premium to Messrs. McKewan & Swan, Birmingham.

RECENT PROPOSALS FOR AN AMENDMENT OF THE LAW AND PRACTICE AS TO ANCIENT LIGHTS.*

THE purport of this paper is to give a brief account of the efforts that are being made to bring about an amendment on that subject of perennial interest to most surveyors, provincial as well as metropolitan, the law and practice of Ancient Lights, and to discuss the proposals formulated.

It is, I think, generally agreed that the great body of case law which has been built up upon the basis of the simple enactment on the Prescription Act of 1832, that "when the access and use of light to and for any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible," includes many judgments difficult to reconcile with one another, and that there is not to be deduced from them anything like a clear or definite rule by which the owner of an ancient light on the one hand, and the owner of property adjoining, upon which buildings are about to be erected or increased in size, on the other, are able to ascertain what are really their respective rights and to what limitations these rights are subject.

The position of the doctrine of the 45 deg.; the claim to a right for a special quantity of light for extraordinary purposes; the definition of what is meant by material and substantial injury to lights; the question as to whether, if sufficient light be left, it matters as to how much, beyond that sufficiency, is taken away—all these questions and others seem apparently to be insoluble by the Courts and constitute a fruitful field for the production of differences and disputes between building-owners and the owners of ancient lights, and the cause of constant recourse to the Courts at considerable expense in money, time, inconvenience, and irritation, by way of injunctions to retain or actions for damages, with, in many cases, results which are satisfactory to neither party. Some have indeed gone further than this in their complaints of the state of the law, and have contended that the power given to the owner of even a very small and unimportant light to restrict or in any case delay the erection of important buildings, has led to serious hardships, and has in some cases opened the door to what can be described as little sort of blackmailing operations. And it is clear to anybody who has much to do with light and air cases in the Courts that it is difficult for the ordinary legal tribunals to deal with these technical questions without great waste of time, and in many cases uncertainty as to substantial justice being done.

Actuated by these considerations, the Royal Institute of British Architects in the beginning of 1900 came to the opinion that an alteration in the law of Ancient Lights was urgently needed, and placed itself in communication with the Surveyors' Institution, and the two bodies appointed a Joint Committee which made a Report on the subject at the end of 1900, which most of those present have probably seen.

The contents of that Report may be summarised as follows:—

In the first place, it is proposed to limit the right of the owner of an ancient light, where such right has not already been acquired, to a right to receive light sufficient for all ordinary purposes, but not to include a right to an extraordinary amount for special purposes.

In the second place, the difficulty which is sometimes experienced of obstructing a light which would otherwise in the course of time gain dominant rights is obviated by it being placed within the power of the owner of adjoining property over which such rights would, if acquired, be exercised, to give a legal notice to have the same effect as though such obstruction had been put up and submitted to for one year.

In the third place, there is a provision for certification and registration of the plans of buildings about to be pulled down, and I suppose, although the Report does not distinctly say so, the identification of ancient lights existent in the old buildings.

In the fourth place, there is a provision that no building erected after January 1, 1905, shall acquire any further rights of light and air

where it abuts on any way used by the public as an access to various tenements.

In the fifth place (and this constitutes one of the most important parts of the Report), provision is made for the settlement of differences arising between a building-owner and the owner of adjoining ancient lights by means of a tribunal formed of the surveyor for either party or of their umpire, with power to the umpire of determining "the right of the building-owner to carry out his intended works, the alteration (if any) necessary to be made in carrying out the proposed new buildings or alterations to prevent or lessen the obstructions complained of, and the amount (if any) of compensation of every description to be made to the owner, lessee, or occupier, the alterations or improvements to the adjoining premises by light-reflecting surfaces, enlargement of lights, heightening of premises, or other means, the amount of costs to be paid by each or either party, and generally all matters required to arrive at a settlement."

And there is a provision for an appeal to a committee consisting of an architect, a surveyor, and a barrister with power to decide whether and to what extent the proposed new buildings shall be amended or the dominant premises altered. In any case in which a larger sum than 500*l.* is awarded either in money, damage, or works, or in which the interference with the proposed works exceeds 500*l.* in value, there is power of appeal to the High Court. Then side by side with the powers just previously described given to the surveyors, the tribunal, and the High Court there is, in the sixth place, a provision that in any action to restrain a building on the ground of its interference with rights of light, and whether an interim injunction has been obtained or not, either party may apply to a judge either to hear the same with an assessor or assessors, or to refer it to arbitration in the manner before provided.

This Report is in process of being drafted as a Bill, which will then be taken into consideration by the Council of the Incorporated Law Society with the view of the co-operation of that body being obtained. It will be seen, therefore, that the proposals which have been made really amount to this:—

The basis of the law is so far defined as to eliminate from the rights of an adjoining owner any right to light for extraordinary purposes, and to limit them to a right to receive light sufficient for all ordinary purposes, and that the settlement of the question which may arise as to whether sufficient light has been left for all ordinary purposes may either proceed in a way similar to that obtaining in the case of party-walls under the London Building Act (except that the third surveyor or architect called in on light and air cases is to be an independent umpire and not to act in conjunction with one or both of the *ex parte* surveyors), with an appeal to a technical committee, and beyond that to the High Court; or apparently he may still proceed in the old way by an application for an injunction to restrain, which may be referred by the judge to the arbitration before described if it appears to him the claim may be satisfied by damages. This, put briefly, is what the present proposals amount to, but before saying a few words upon them, it may be useful to make some remarks upon the more important of the recent cases which have occupied the Courts which exemplify the accuracy of the view that some simplification of the legal basis for our practice in the subject is absolutely essential.

In the Appeal Court case of *Brown v Collings*, which was decided in 1899, the Master of the Rolls, Lords Justices Rigby and Vaughan Williams concurring, said "it was a question of degree whether there had been such obstruction or diminution of light as to render the premises uncomfortable or unfit for the ordinary purposes of habitation or of carrying on business. He came to the conclusion that a considerable quantity of light which had formerly access to the plaintiff's windows had been cut off by reason of the defendant's building. There ought to be an injunction to compel the defendant to pull down so much of his building as obstructed the access of light as previously enjoyed in the plaintiff's buildings." This was a case where the offending building was to be from 60 ft. to 70 ft. distant from the ancient lights, and the extreme height of same from ground to top of gable was 44 ft. and no more. A portion of the offending wall would have been 32 ft. high, and the Master of the Rolls in his judgment said he thought the

defendant's building should not be above 25 ft. high, and subsequent words he used indicated that it was his opinion that it was not enough to consider whether the plaintiff had a sufficient quantity of light left, but that what had to be considered was the amount taken away. This seems to be a strong judgment in favour of the contention that the owner of an ancient light is entitled to all the light he has enjoyed through it for the statutory period.

It was not many months, however, before a decision embodying quite different principles was given by Mr. Justice Wright, who held, in the case of *Warren v. Brown*, that a house is not necessarily entitled "to have all, or substantially all, the same light coming to its windows as during the twenty years," as this would impose on servient tenements an unreasonable burden and might involve grave public inconveniences. Nor, if that were law, could there well be any presumption that so long as 45 deg. of light, or some approximate angle, is left there is no actionable wrong." The judge, therefore, having found that there was sufficient light left for all ordinary purposes of inhabitation or business, nonsuited the plaintiff and apparently resuscitated the 45-deg. angle theory in a great measure.

This judgment was followed by Mr. Justice Joyce, who held in the case of the *Home and Colonial Stores, Limited, v. Cols*, in a case where the back part of rooms enjoying light through an ancient window was so dark as to have needed artificial light on ordinary days, but where the remainder of the plaintiff's premises would, after the erection of the defendant's building, be well and sufficiently lighted for all ordinary purposes, nonsuited the plaintiffs, although it was shown that they would lose a considerable quantity of the light they had previously enjoyed, feeling bound, as he stated, to follow the decision in the case of *Warren v. Brown* until it was upset.

Apparently the Appeal Court case of *Brown v. Collings* did not seem to be available for use by either of these judges in arriving at their decisions; there is no reference to it either in the arguments or judgments. I understand that both judgments are to be appealed against.

A subsequent case in which I was engaged, and which occupied one of the judges above-mentioned the better part of three days, rests at the present moment upon an expression of opinion by the judge, in which a distinction was drawn which appears to modify to a great extent in certain cases the dictum laid down in the last two-mentioned cases, but under the circumstances I cannot say more than that at the moment.

I do not quote these cases as giving in any way an exhaustive description of the tendency of recent cases, but simply as indications of how complicated the question has become and how impossible it is for a layman, even though he possesses the technical knowledge which the practising surveyor or architect should have, to guide his clients as to what he is in building entitled to do, or what, if the owner of an ancient light, he has the power to prevent his neighbour doing; and I think they show very clearly that some such proposals as those now made are very desirable in the interests of all owners of property.

Some of these proposals appear to me to demand consideration. That part of the preliminary proposition which provides that no right may be acquired to an extraordinary amount of light for special purposes would most certainly have been the subject of animadversion on the part of that section of the community who habitually use light for special purposes, such as watchmakers, goldsmiths, precious stone merchants, and those utilising processes necessitating discrimination in the selection of colours, who in some cases might find the amount of light they have enjoyed reduced, much to their disadvantage, but the sting of the proposition is removed by its not being made retrospective, but only to take effect on the acquisition of subsequent rights, and I think upon the whole the proposition is to the public advantage in permitting the utilisation of sites which under the present law may have to remain vacant or only to be built upon in a limited way, though in some instances there is no doubt that it may be the cause of a certain amount of loss on the part of individuals.

The other part of the first proposition, stating that no new rights of light may be acquired beyond a right to receive light for all ordinary purposes, seems to me somewhat ambiguous, as

* A paper by Mr. Philip E. Pilditch read on Thursday last week at the Conference of the Surveyors' Institution at Southampton.

it may be read either in the limited sense of providing for ordinary light only as an antithesis to extraordinary light, or it may be read as providing that if sufficient light be left for all ordinary purposes there can be no claim, even though a substantial and material quantity of the light previously enjoyed be taken away. If the latter be meant, which I think most likely, then the proposition is far-reaching in its character, and extends to a complete alteration of the law as laid down in many cases, and will permit for the future considerable and material obstruction of light in cases where the windows have not yet become ancient, so long as, in the opinion of the tribunal, sufficient light be left for ordinary purposes. It is as well that the full significance of the change should be appreciated, for it would mean that in all cases where a light is less than nineteen years old the rule of law affecting it would be much more stringent in favour of the servient tenement than in the case of a light already ancient.

Upon the whole I think the change is to the public benefit, though at the same time I think any change permitting the building of higher buildings and the filling-up of spaces now kept open by the existence of the present law of Ancient Lights will not necessarily be an un-mixed advantage, as witness the tendency of modern building legislation. Possibly the removal of this restriction upon the right to build may have a sequel in the further strengthening of that legislation, which now bears more lightly upon buildings in settled closely built over districts than in new ones. It is, I think, better that the regulation of buildings in this respect should be a matter of public regulation than of private arrangement, but I am not sure that all property owners will agree with this, or that those most desirous of the proposed change in the law appreciate what the result may be.

The second and third propositions need no recommendation.

The fourth, however, is one which seems to me to need careful consideration, especially the part of it which provides that no further rights of light shall be acquired by a building erected after January 1, 1905, abutting upon a way used "as an access to various tenements," for this apparently would give the right to a building-owner to absolutely obstruct the whole of the light coming to a window only a few feet away, simply because it happened to be on the other side of a passage-way, and the same objection applies, indeed, to such a right being given to the owner of property abutting upon a public way where that way is narrow, and where, consequently, the same state of affairs exists as I have just described.

It appears to me that if this provision limiting the rights of the owner of an ancient light because it abuts upon a way is adopted at all (I hardly see why such a light should be differentiated from all other lights) there ought to be a provision limiting its operation to cases where the way in question is of a certain minimum width. Moreover, unless I have read the second proposition and this inaccurately, this one is not needed, as the second would give the owner of each tenement the right to prevent the other from acquiring rights over his property by notice, unless there be some virtue in the words "not at the time servient to some neighbouring tenement" in the second proposition. I think both suggestions need making clearer, but this will doubtless be done in the Bill.

The most important of the propositions referred to, viz, the 311 is, I think, likely to be very beneficial in its operation.

All of us who have practised in London have had experience of the ease and expedition with which matters concerning party-walls are habitually dealt with under the similar provisions in the party-wall sections of the London Building Act, and I feel convinced there is nothing in the subject of light and air which will render it impossible to do in such cases what has been done with so much advantage to all concerned in party-wall cases.

On most of the large London estates the custom now obtains of reserving all rights to light when granting a new lease, leaving questions of light and air arising between different lessees on the same estate to be settled by the arbitration of the estate surveyor or architect, and on two such estates with which I am so connected the custom has been found in practice to work admirably. No lessee is hampered by trivial objections, and on the other hand a building lessee is not allowed to ride roughshod over his neighbour's rights, but



Capital, Scarborough Technical Schools. Mr. H. C. Fehr, Sculptor.

Illustrations.

PULPIT, SANTA CROCE, FLORENCE.

THIS pulpit was the work of Benedetto da Maiano. Vasari, in his life of this artist, thus describes it:—"Returning to Florence, he did the present marble pulpit of S. Croce for Pietro Mellino, a citizen and wealthy merchant, considered a work of rare merit, the very best of its kind. It contains in small marble figures stories of St. Francis, executed with such skill and diligence that nothing better could be desired, as he has carved there trees, rocks, houses, perspectives, and other things marvelously. . . . It is said that while this work was in progress he had difficulties with the wardens, for he wished the pulpit to stand against one of the columns which bear the arches supporting the roof, and to cut away the column to make the steps and entrance to the pulpit, and they would not consent, thinking that this would so enfeeble the column that the destruction of the church would ensue. But after Il Mellino had given security that the work would be finished without any harm being done to the church they were satisfied. Accordingly, Benedetto strengthened the part of the column carrying the pulpit with bronze supports, and introduced the steps to mount into it. In proportion as he hollowed out the interior he strengthened the exterior with hard stone, as may be seen, and he completed the work to the amazement of all who saw it, for it possesses the utmost perfection in every part."

TECHNICAL SCHOOLS, SCARBOROUGH

We give this week several illustrations of the new Technical Schools at Scarborough, of which Messrs. Hall, Cooper, & Davis are the architects.

The plans were selected in an open competition in which thirty-six designs were submitted. The completion of the buildings has occupied about four years.

Its situation rendered it essential that the levels should be very carefully considered, having in view the great fall in the ground. The plan of the schools was arranged with the idea of avoiding, as far as practical, unnecessary cost in the construction of the foundations. The northern side of the site has been levelled, and forms the approach, directly connected with the Valley Bridge-road at the north-east corner. The boys' and girls' main entrances are placed on the approach road, and are connected to the schools by bridges placed across the area which is formed to light the basement. Entrances for both boys and girls are also placed on the south side of the site entering direct from the public park. A portion of the site on the south side of the buildings has been levelled off and asphalted for the purposes of a playground, whilst it is proposed to lay out the remaining portion of the site in terraces, lawns, and walks.

an opportunity is afforded the estate surveyor of seeing substantial justice done.

It will be observed that by the sixth proposal it is still open to an aggrieved owner of an ancient light to apply to the High Court for an injunction, and the Court has it within its discretion, in cases where it considers justice will not be met by a reference to arbitration, to decide what may be done or what compensation should be made, to grant an injunction to prevent the erection of the buildings complained of.

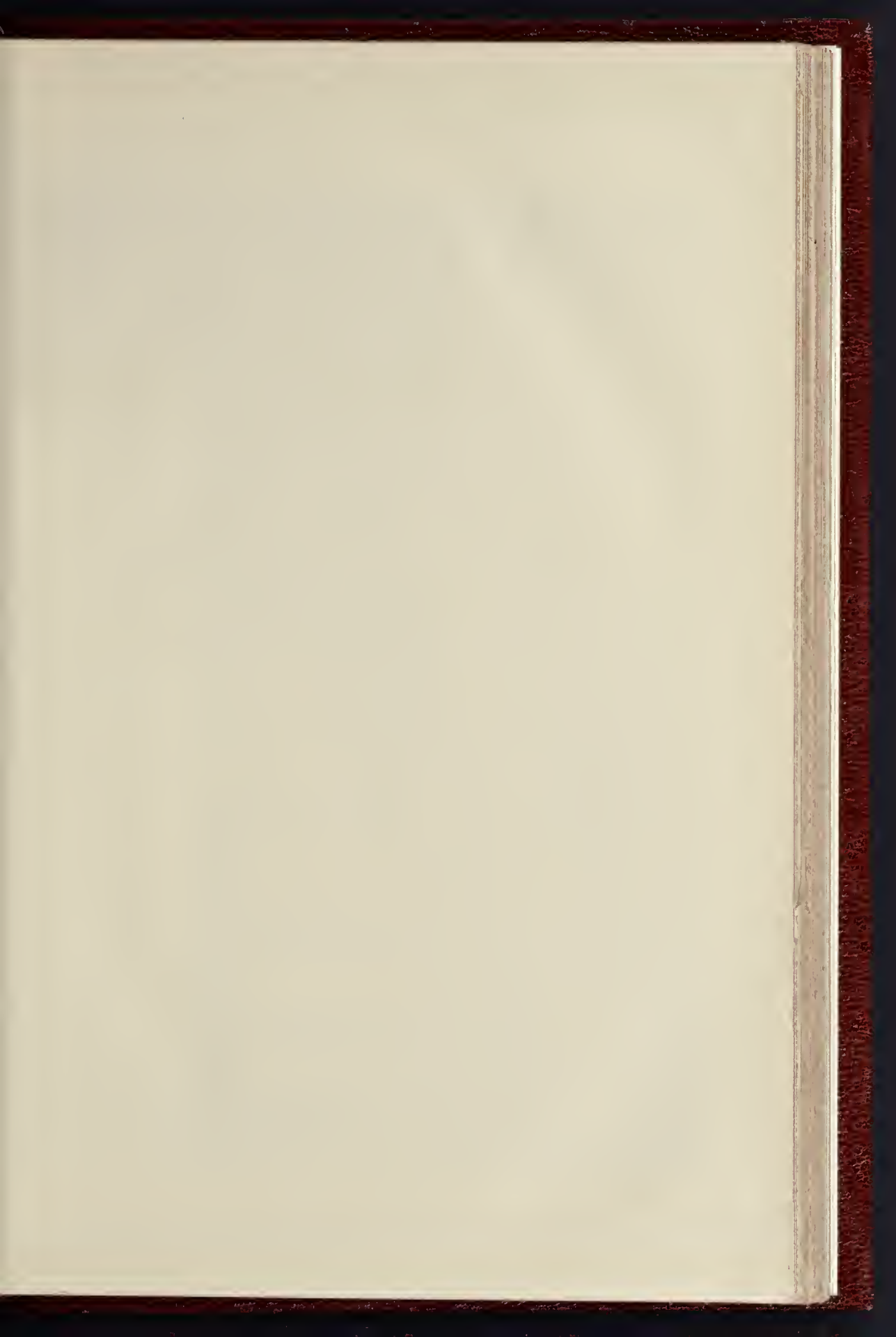
It is in the existence of a tribunal to which, if it appears that the case in question is not of this far-reaching nature, the Courts may have confidence in transferring a settlement of such matters that the proposals now made have their chief value, and it is in my opinion very clear that one consequence will flow from the existence of this tribunal—viz., that a claimant having no solid or serious claim will hesitate before applying for an injunction, which has been so freely done in the past, when the building-owner has so often had to compromise because of the delays to which he would otherwise be subjected, especially as it is now made clear in black and white that if the judge considers an action for an injunction has been commenced unreasonably or unnecessarily he may order the party bringing such action to pay the defendant's expenses and costs on such scale as he may think fit.

In conclusion, I think the proposals made, with some modifications, will, if embodied in an Act, tend to simplify the operations of building and rebuilding in London without any undue interference with the existing rights of individuals, or with the weal of the body politic, and I trust they may soon be given effect to.

COMPETITIONS.

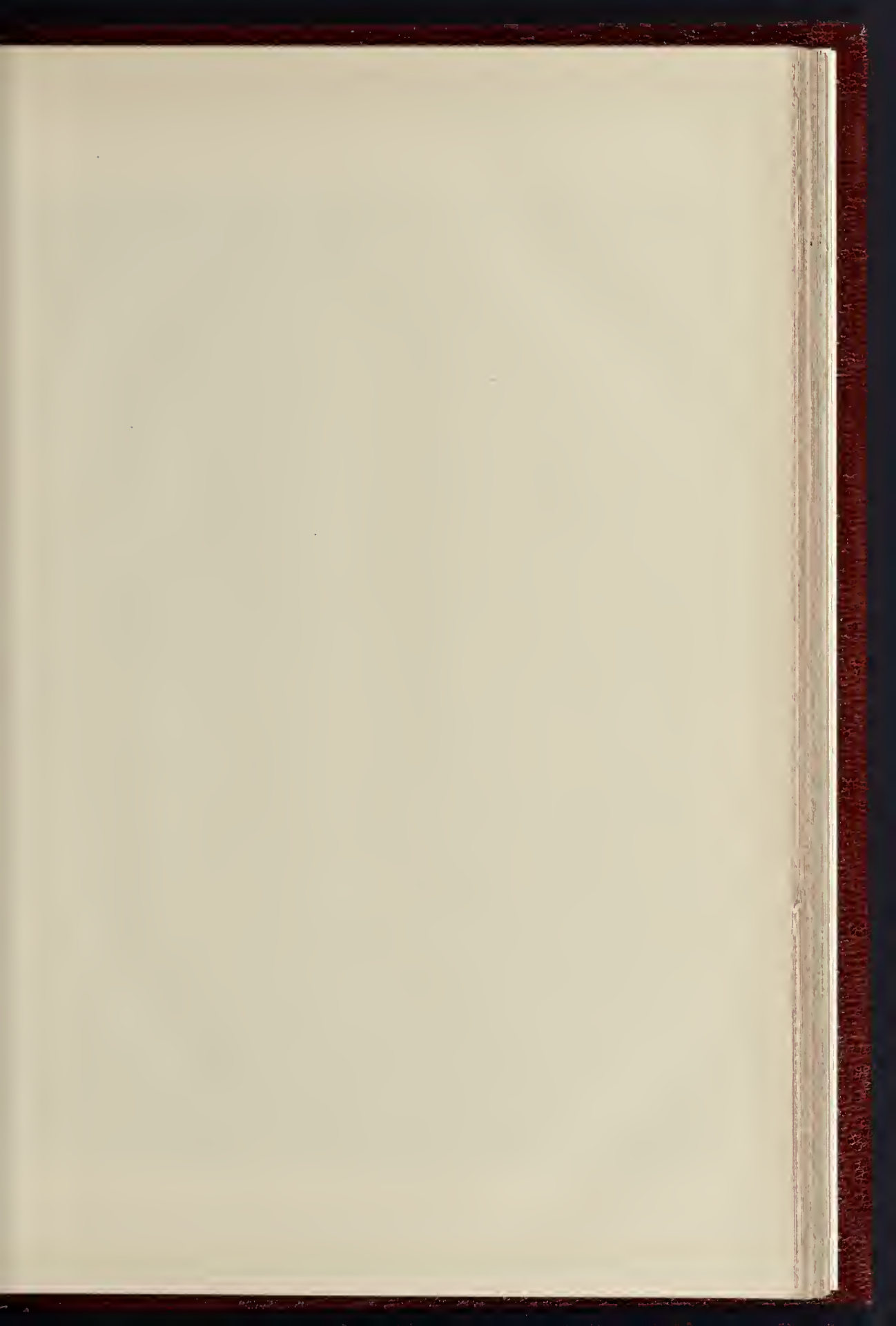
SCHOOL, NEW BROMPTON.—The Gillingham and Grange U.D. School Board advertised in April for designs for a proposed new school in Richmond-road, New Brompton, and in response a number of plans were sent in. The result has just been made known, as follows:—(1) Mr. J. D. Pearson, 27, Chancery-lane, London (1901); (2) Messrs. Newton, Son, and Lawson, 14, Victoria-street, Morecambe (Hotspur); (3) Messrs. Greenhalgh & Brockbank, Broad-street House, London, E.C. (Utility with Economy); (4) Mr. F. M. Kirby, Greenhithe, Kent (North Light). Mr. Pearson has been appointed to carry out the work.

HOUSE AT BARNET GREEN, WORCESTERSHIRE.—Messrs. Bateman & Bateman write to say, in regard to the description and illustration of their house in our last issue, that they had been under the impression that we asked for a description of their design in the Royal Academy, under the same title, but representing another house, and that their description applied to the one in the Academy, not to the one we published last week. The two houses are very similar in general character, and therefore we did not notice any discrepancy.



THE BUILDER, JUNE 8, 1901.



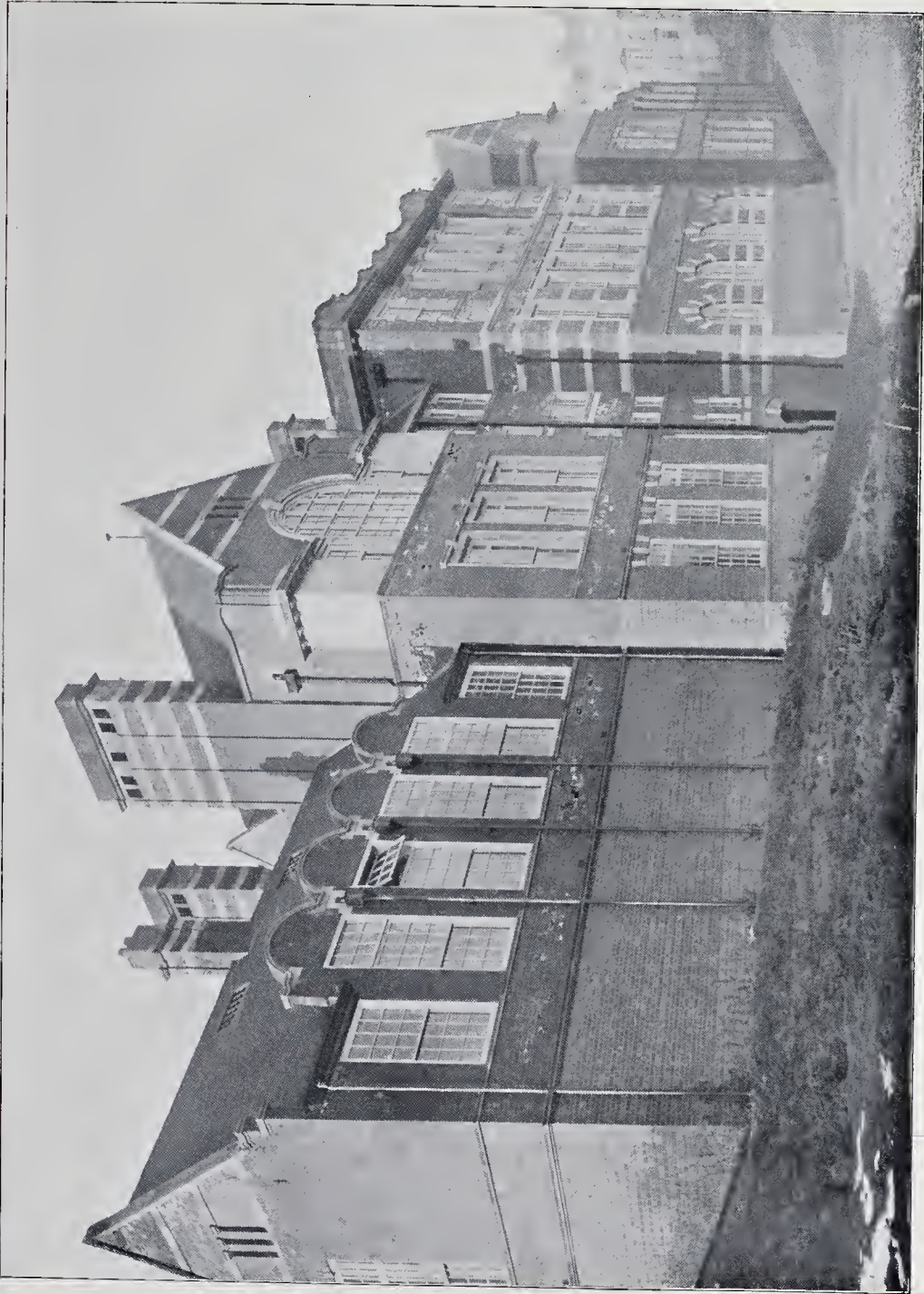


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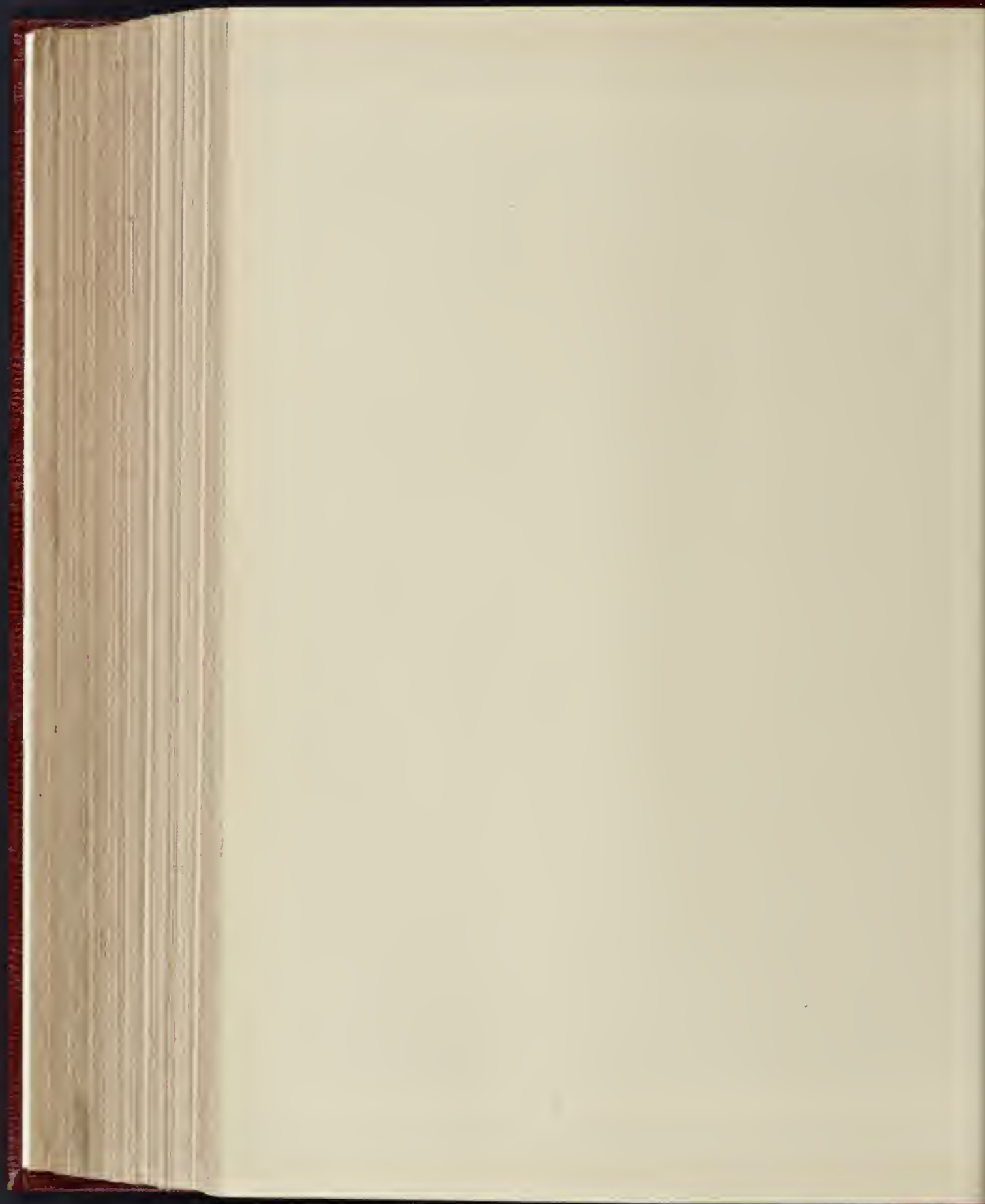
TECHNICAL SCHOOLS, SCARBOROUGH, MESSERS, HALL, COOPER & DAVIS, ARCHITECTS
NORTH SIDE.

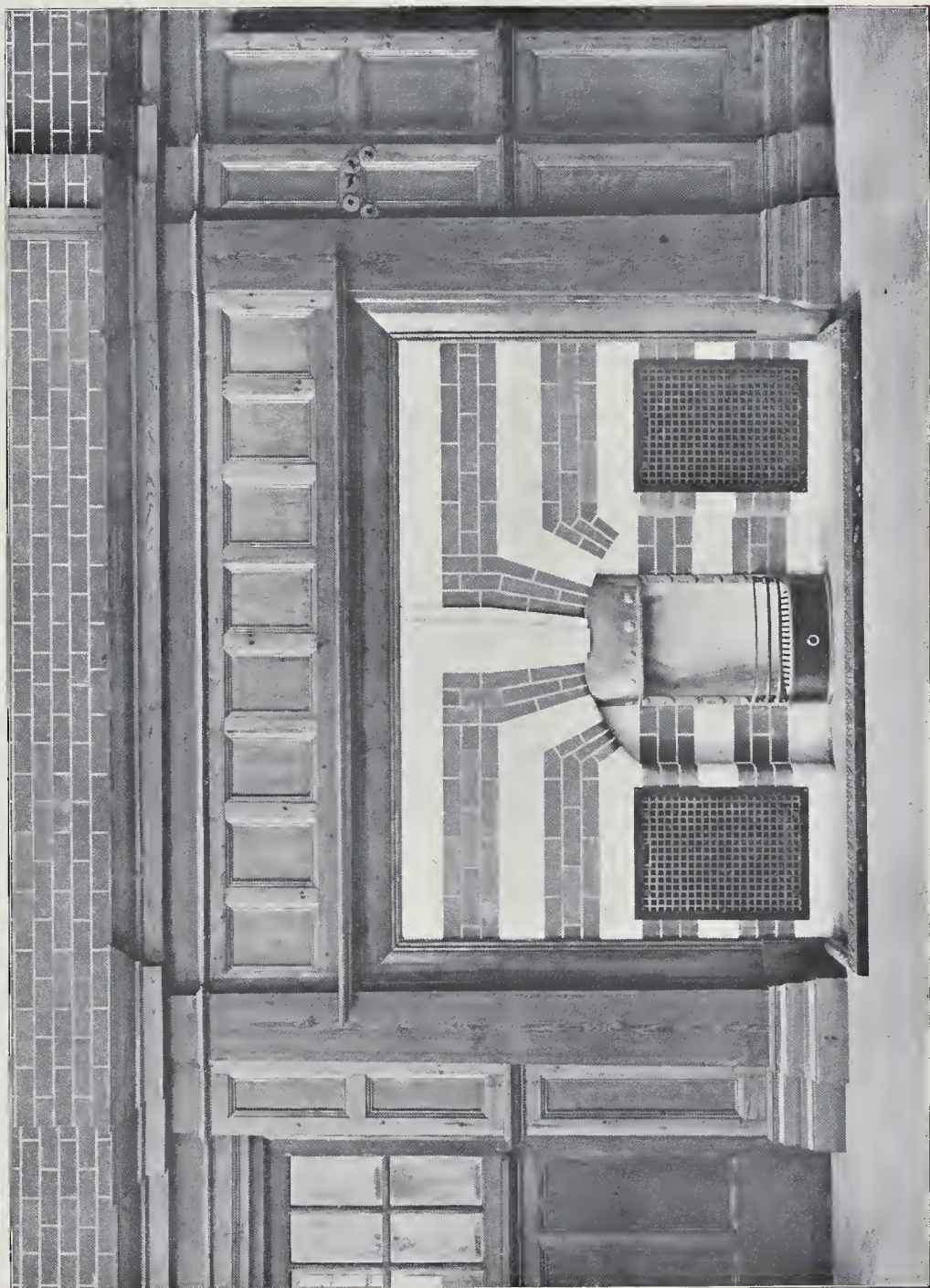
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TECHNICAL SCHOOLS, SCARBOROUGH.—MESSRS. HALL, COOPER & DAVIS, ARCHITECTS.
SOUTH SIDE.

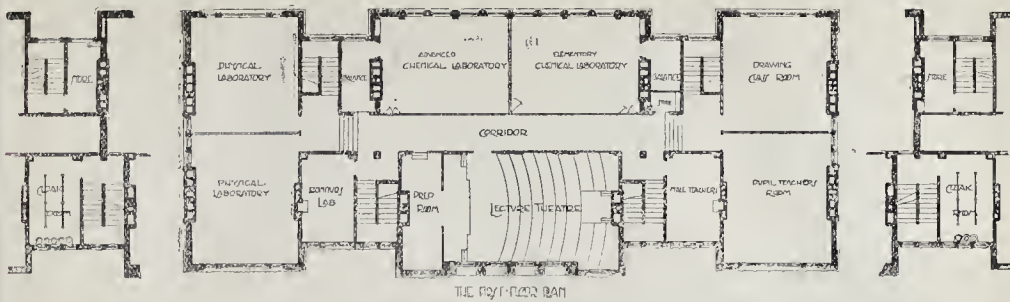




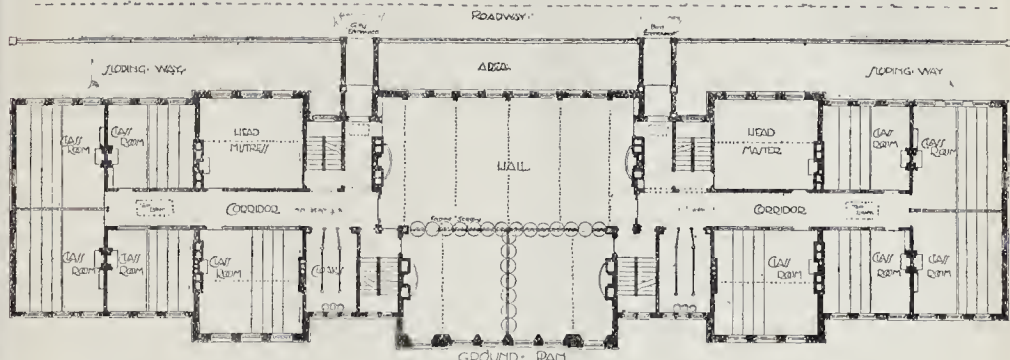
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TECHNICAL SCHOOLS, SCARBOROUGH.—MESSRS. HALL, COOPER & DAVIS, ARCHITECTS.
FIRE-PLACE IN HALL.

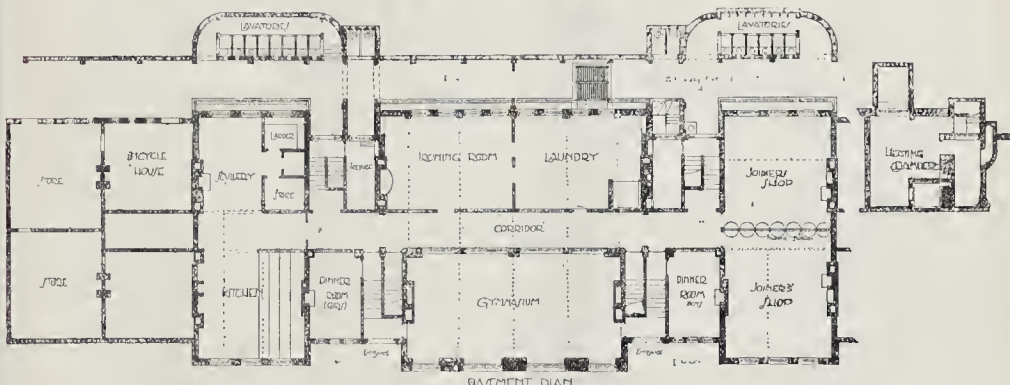




THE FIRST-FLOOR PLAN



GROUND-FLOOR PLAN



BASEMENT PLAN

Technical Schools, Scarborough. Plans.

The basement is 14 ft. high in the clear, and one of its features is a gymnasium, 20 ft. high, reached from both playgrounds by means of boys' and girls' open porch and a separate staircase. There is also a complete laundry, consisting of ironing and washing rooms, with driers, for the instruction of forty girls in two classes. Immediately adjoining this is the cookery kitchen, with scullery and pantries abutting on the girls' main staircase. There is accommodation in the cooking kitchen for thirty-six girls, and it is fitted with gas stoves and open fireplaces, and all necessary shelving, tables, cooking utensils, and requisites for the instruction classes.

Towards the east side are two dining-rooms for twelve children each, accessible from the respective playgrounds. Adjoining the boys' dining-room is a spare classroom, and immediately adjoining this is a joiner's shop, with accommodation for forty boys. There are also unpacking-rooms, storeroom, cloakroom, and lavatory for each department using this floor. A caretaker's room, a boiler-house, heating chamber, &c., are also provided for.

The ground floor is 15 ft. 9 in. in the clear, and is fireproof. The boys' and girls' main entrances are connected with the new ap-

proach road by bridges spanning the areas. Two cloakrooms adjoin the main entrance each having 500 pegs and lavatory basins. There are on this floor four classrooms with accommodation for forty; there are four with accommodation for fifty; and four with accommodation for sixty, making a total of twelve classrooms with accommodation for a total of 600 children. Each classroom is provided with book cupboards, with sliding doors, arranged in recesses in internal walls. Out of the twelve classrooms provided, ten face the south.*

The central hall, of which we gave a view, covers a superficial area of about 3,600 ft. and can be used for a variety of purposes. The fireplaces (see illustration) are built up of red Sussex brick and white stone, and a panelled white dado, 9 ft. high, runs round the entrance hall, with a dentil cornice on the top. Above this the walls are lined with red Sussex rubber brick, which runs up and joins the ceiling and cornice, which is in plaster. On one side of

the central hall is to be found the headmaster's room, ante-room, packing store, with lift communicating, and on the other side the school lavatory.

On the upper floor there are two rooms for assistant teachers—one for each sex—placed over the cloakrooms, and reaching from the second half-pace of the main stairs. There is also a classroom for pupil teachers' instruction, containing 480 superficial feet. A chemical laboratory is provided, with fifty benches divided by glazed partitions into sections, and a room for honours work, the whole being fitted up to the regulations of the Science and Art Department with fume cupboards, blackboards, and stores for re-agents, &c. There is a small balance-room overlooked from the chemical laboratory properly fitted up with glass cases, working table, and draught closet. A physical laboratory for thirty-two students is provided, and is divided into two sections by a screen. There is a lecture-room to accommodate 100 students, provided with demonstration-table and platform, and lantern platform, with shutters to the windows for darkening the room during the lantern lectures. A preparation room is connected with the lecture theatre. There is a drawing classroom with top and north studio

* This is the architects' description, and we presume the school authorities had an opinion in favour of a south aspect for classrooms. We can only say that we think it a serious mistake. South aspect for dayroom or playroom is quite right, but not for a lesson-room.—Ed.

light to accommodate sixty elementary students, and a small classroom for the same purpose for advanced students. These rooms are placed near the boys' staircase, but are accessible from the other staircases. Besides a spare classroom, with accommodation for sixty, a book store, with lift and caretaker's cupboard, are provided.

The latrines are separated from the school and placed under the roadway adjoining the area. They are well ventilated, and have the latest approved sanitary appliances.

The whole building is warmed by open fires and steam radiators at low pressure, the work having been carried out by Messrs. W. Richardson & Co., of Darlington. The school is ventilated by a system of natural ventilation with extra shafts from each room, with inlets at the ceiling and floor levels, and carried into the roof ventilator. There are fresh air inlets at the window levels direct from the outside, passing through steam radiators, the rooms on the top floors having extractors in the ceilings. The building is lighted by sash windows, all of which are made to open.

So far as the erection of the school is concerned, all the contracts were let locally. Mr. James Gales carried out the excavation, brick, and stone; Mr. Hugh Proctor, the plastering; Mr. Geo. Scates, the carpentry and joinery; Mr. Jos. Hardgrave, the red brick tiling; Mr. Thos. Fidler, the painting; and Messrs. Tindall & Williams, the plumbing and glazing. Mr. G. F. Wells, of Scarborough, installed the electric light; Mr. Harry Pickup, of Scarborough, did the ordinary smith work; Messrs. Homan & Rodgers, of Manchester, have done the whole of the fireproof construction floors; and all the movable screens have been made by the North of England School Furnishing Company, according to their own patent. The fittings of the laboratories and scholars' desks are by the Bennett Furnishing Company, Glasgow. The teachers' desks and the fittings in the manual instruction room were supplied by Messrs. Illingworth, of Leeds, and the laundry was fitted by Messrs. Summerscales, of Halifax.

In addition to the practical building work and fitting, the architects desired to have the building adorned with sculpture having some reference to its objects, and they wisely went to an eminent sculptor, Mr. H. C. Fehr. He modelled the five panels which are illustrated in a separate plate. In that illustrating "Chemistry," the central figure is a likeness of Priestley; in "Engineering," that of James Watt; in "Astronomy," Herschel, and we presume the female figure is meant for that of his indefatigable sister, who with him carried on the business of comet hunting through many laborious night; and in "Architecture" we have Wren as the principal figure. "Literature" the sculptor has chosen to represent entirely by women students, perhaps because it is intended specially for the girls' side of the school; a corresponding panel is to symbolise "Music."

As a separate illustration we give that of one of the capitals of the small order which forms an ornament to a portion of the south elevation; this is also Mr. Fehr's work.

We give also the plans of the three principal floors.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The annual meeting of the Devon and Exeter Architectural Society was held at Plymouth on Saturday, the 1st inst. The President, Mr. C. J. Tait, occupied the chair. There were also present Messrs. H. G. Luff, Charles King, Edmund Sedding, M. Alton Bazeley, A. S. Parker, Octavius Ralling, B. P. Shires, A. Heath, W. W. Hitchins, S. Griffin, A. E. Lethbridge, E. Coath Adams, R. A. Mill, A. Tucker, Harold Watts, G. Murray, and Harbottle Reed (Hon. Secretary). It was resolved that a subscription of three guineas and a donation of two guineas be made in response to the special appeal for the Architects' Benevolent Fund. The retiring President (Mr. Tait) then delivered an address. In the course of his remarks he said:—"The event for which this year will be chiefly memorable will be in the minds of us all—the death of the late Queen. . . . Upon anything that occupies a position so near to us as the Victorian era it is impossible to utter the final note of criticism. This can only be accomplished when a period has sufficiently detached itself. Four centuries ago saw a Classic Renaissance in art and letters,

and we can to-day judge of its character and achievements. When we are enabled to view the Victorian age from a perspective point—its hopes and aims for art—we shall, I think, agree that these also found expression in a re-birth, the re-birth of romanticism. This romantic note was heard in its deepest tones, perhaps, at Oxford, and occasioned that upheaval of feeling that is spoken of as the Oxford Movement. In so far as this was a Church movement—and indirectly affected Church architecture—it assisted to bring to the front such men as Augustus Welby Pugin, George Gilbert Scott, and George Edmund Street. But the springs of this movement lay deeper in art than perhaps in anything else, and found therein a more complete expression. Edward Burne-Jones and William Morris, both young Oxford undergraduates and destined for the Church, left the University without their degrees and devoted themselves, the one to painting and the other to architecture. And outside the walls of the University they met with a more paramount influence still—that of Dante Gabriel Rossetti—and the enthusiasms of young men like themselves, such as Madox Brown and Millais. Through the painters, with places for exhibition at their disposal, the new movement gradually reached the public, who was finally convinced, much against its will and not without a hard struggle. To William Morris, in particular, we architects owe more than I can say. He insisted on the importance of colour in architectural accessories; and his commercial undertakings slowly enabled him to force the fashion, that doorway by which alone society is accessible to new ideas. Meanwhile, Burges, Norman Shaw, and E. W. Godwin were grafting a fresher growth on to architecture. But architecture transforms itself with difficulty. Styles have resistant materials to deal with. They are long growing, and they are 'an unconscionable while a-dying.' They further demand specific needs for their true development, and these needs, while our social conditions are in that rapid fluctuation in which we find them to-day, are superseded before they have had time to arrange themselves in definite form. Further, this renaissance of the Medieval, of the romantic sentiment, reveals to us our true position—the position we hold as inheritors of both Classic and Medieval tradition. The claims of Gothic architecture are strong. Nothing can, however, be representative, nothing can be all preceding influences—a something which combines the refinement of the Classic with the freedom of the Gothic. Such a union is no fancy. Something of the kind was achieved by Tudor architecture; and I venture to think that it is also by the combination of these qualities that the most striking successes in modern design have been realised. If this be a principle, as I hold that it is, then it behoves every architect to cultivate a catholicity of taste. His appreciative powers will be quickened, and he will find his life in all respects both fuller and broader. I may be told that specialism is more remunerative. To have your name intimately connected with some particular and limited want or department is the surest way to be recognised by a public who thinks little and whose memory is bad. But the age is not without signs that specialism and cranks in general have enjoyed their most profitable period, and that it is not so patient of the formalist and the pedant as it used to be. Let me quit the events of a century for those of a year. The Strand Improvement scheme resulted in a competition which called forth some half-dozen very interesting designs. The Report upon these, which Mr. Norman Shaw is to make, has not yet been published. It must be noticed, with regret, that the London County Council sought to engage the services of the competitors upon most unreasonable terms, inasmuch as it would give no guarantee that the successful architect should execute his own design; and it was in every way so cavalier in its dealings with the Royal Institute, whom the Council had itself approached, that the Institute was obliged to decline further co-operation. Another circumstance, calling for our attention, was the fact that the County Council had no clear intention as to what it actually required, and hoped, with Mr. Micaewar, that amid the surprises of competition 'something might turn up.' To think that you want to include a municipal building among shops and offices, but are not sure, can lead, one would think, to no very definite

competitive result. Another competition, and one of national importance, at present occupies the public interest—the proposed memorial to the late Queen. It appears to be generally regretted that this endeavour has not been put upon broader lines. The least defensible part of it is undoubtedly the placing, whatever sculpture shall be employed, in the hands of a single sculptor. The only apology that may be made by the initiators of the scheme is that they consider sculpture of such minor importance as to render any multiplication of ideas unnecessary. This, I venture to think, will hardly recommend itself to those who realise the part played by sculpture during the best periods of monumental art. Negotiations have for long been carried on between the Royal Institute and the Builders' Association, with a view to a common understanding upon a form of contract that shall be acceptable to both architect and builder. You are, no doubt, aware that these negotiations have been broken off with their object still unfulfilled. The cause of the failure is apparent. Unless the Builders' Association can obtain a form of contract that is distinctly favourable to it, its members know that they are more safely situated in the hands of the architect directing the work, and prefer to leave matters as they are. The negotiations have, however, been successful in producing an exceedingly fair and thorough arbitration clause, between which and one directing that the architect shall be sole arbitrator there is no half-way house. . . . Mr. Tait was accorded a hearty vote of thanks for his address.—Mr. H. G. Luff was then elected President; Mr. John M. Pinn Vice-President; Mr. Harbottle Reed, Hon. Secretary; Mr. Octavius Ralling, Hon. Treasurer; and Mr. Alton Bazeley, Mr. Charles Cole, and Mr. C. E. Ware members of the Council. Mr. Ralling gave notice that he would move that the Hon. Secretary of the Three Towns branch be *ex officio* member of the Council. Votes of thanks were given to Mr. Tait, Mr. Reed, and Mr. Ralling for their services in the past year.

ARCHITECTURAL ASSOCIATION OF IRELAND.—A general meeting of the members of this Association was held in the Grosvenor Hotel on the 30th ult., the President, Mr. Frederick Batchelor, occupying the chair. Amongst those present were Messrs. J. Rawson Carroll, J. Howard Pentland, W. Kaye Parry (Hon. Sec., Royal Institute of the Architects of Ireland), C. J. MacCarthy, Anthony Scott (Drogheda), F. Shaw (Drogheda), R. M. Butler, T. E. Hudman, G. F. Beckett, J. H. Webb, Fred. G. Hicks, E. Bradbury, &c. This meeting was the concluding meeting for the Session 1900-1901, and the reports of the various classes were read and the results of the several competitions announced. The Class of Design was very satisfactorily attended during the session, and good work is recorded; the prizes in connexion with this class are gained by Mr. W. Connolly (first prize), and Messrs. J. K. Vinycombe and H. J. Leask (tie for second prize). The Hon. Secretary of this class was Mr. G. Lynes. The Architectural History Class (Mr. R. M. Butler, Hon. Sec.) was also well attended, and proved a most useful innovation; in this class the progress and changes in architecture were traced by the lecturers, and illustrated by lantern views of typical examples. In the Building Construction Class the first prize is won by Mr. H. J. Lundy and the second by Mr. W. Connolly. Mr. W. H. Ward was secretary to this class. The report of the Design Club is not so encouraging, and it is hoped that in future better attendances will be maintained. Probably the most satisfactory of all reports is that of the Technical Demonstrations Sub-Committee. The necessity for giving architectural students an opportunity of studying practical details, and of discerning between good and bad materials and workmanship, is one which had not been met heretofore, and early in the session steps were taken to inaugurate what turned out to be a most successful series of practical demonstrations, for the arrangement of which are largely responsible the untiring efforts of the President and of the Hon. Secretary of the Sub-Committee, Mr. H. Allberry. The master-craftsmen of Dublin most readily and generously co-operated in the work, personally conducting the members of the Association over their yards and workshops, and explaining, lecturing, and demonstrating upon the different materials and manners and methods of work. The value of these demonstrations was so very evident, that

many gentlemen became members of the Association in order to avail themselves of them. Prizes were offered for the best series of notes taken, and were awarded in order of merit to Messrs. L. O'Callaghan, H. T. O'Rorke, and F. Morley. The members of the Association have reason to be particularly grateful to those contractors and master-craftsmen who so generously assisted in the work. The Librarian, Mr. J. Geoghegan, submitted a satisfactory report. In addition to the valuable library which Sir Thomas Drew has kindly placed at the disposal of the members of the Association, a lending library has been lately started, the volumes in which have been presented by several gentlemen or purchased from a fund which has been opened for the purpose. The A.A. Travelling Studentship of ten guineas was won by Mr. J. A. Rockett, whose measured drawings of St. Patrick's Cathedral were adjudged by Mr. A. E. Murray, A.R.H.A., as the best of those submitted in competition. The Royal Institute of the Architects of Ireland offered a prize of 10l. 10s. for a design, to be competed for by members of the Association. The subject set for design was "A Technical School," and seven members submitted drawings, under motto, which were kindly assessed by Mr. W. H. Lynn, R.H.A. (Belfast).—Mr. W. Kaye Parry read the assessor's award, which placed first the design submitted under motto "Cui Bono," and upon the President opening the envelope bearing that motto it was announced that the successful competitor was Mr. C. P. Powell. Mr. W. F. Beckett's prize of 2l. 2s. for the best sketch of the campaign in Trinity College is won by Mr. L. O'Callaghan.—The result of the ballot for the officers for the ensuing session (1901-1902) was announced as follows: President, Mr. C. J. McCarthy; Vice-Presidents, Mr. T. E. Hudman and Mr. E. P. Sheridan; Committee, Messrs. H. Alberry, F. Batchelor, R. M. Butler, T. Coleman, F. G. Hicks, J. Holloway, C. H. Mitchell, L. O'Callaghan, R. C. Orpen; Hon. Treasurer, Mr. J. H. Webb; Hon. Librarian, Mr. J. Geoghegan; Hon. Secretaries, Messrs. E. Bradbury and G. F. Beckett; Hon. Auditors, Messrs. M. J. Buckley and J. P. McGrath. The retiring President (Mr. Frederick Batchelor) delivered a short valedictory address, in which he reviewed the work of the Association during the past session, and expressed hopes for the future. He referred to the series of day classes recently inaugurated by the London Architectural Association, and trusted that something of a similar nature, though on different lines, might be started in connexion with this Association. Mr. Kaye Parry proposed a hearty vote of thanks to the retiring President for his valuable services during his term of office, which was seconded by Mr. C. J. McCarthy and carried with applause. A vote of thanks to the retiring hon. secretary, Mr. F. G. Hicks, was proposed and seconded by Mr. H. Alberry and Mr. R. M. Butler respectively, who, as past secretaries, were able to appreciate the arduous nature of his duties. The vote was carried with acclamation, as was also one to Mr. J. H. Webb, Hon. Treasurer, proposed by Mr. T. E. Hudman and seconded by Mr. E. Bradbury. Mr. J. Rawson Carroll having congratulated the Association upon the work done during the past sessions, the meeting terminated.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on the 3rd inst., Mr. Charles Mason, President, in the chair, a paper was read on "Concrete Subways for Underground Pipes," by Mr. Arthur Taylor Allen. In introducing the subject the author referred to the construction of the first subway in England for underground pipes, which took place about the year 1860, in the city of London. This was followed a year or two later by one in the city of Nottingham. He noted the lack of progress there had been in the extension of these new arterial thoroughfares, far beyond one being constructed at St. Helens in 1898, very little had been done in that direction to minimise the evil resulting from the continuous breaking up of roadways for access to the numerous pipes laid under every thoroughfare. He gave a long list of streets broken up in the course of one year for obtaining access to pipes. He also pointed out the danger and inconvenience likely to arise from roadways being laid over a number of gas-

pipes, which might soon prove to be of insufficient capacity or become defective, and over water-mains that were laid years ago when the water supply was very limited. The author referred to the sections of the various Acts in force empowering public companies to break up streets after due notice, causing the total or partial blocking of a thoroughfare, interfering with traffic, and operating temporarily to the prejudice of business-houses, the owners having no claim for any loss sustained thereby. He then alluded to the increasing number of underground pipes, and the possibility of the provisions of the Rivers Pollution Acts being more rigidly enforced, and in the near future throwing upon some authorities the necessity of separate sewers for surface or storm water. The author then described the subways in London, Nottingham, and St. Helens. To relieve doubt as to the possibility of a severe frost affecting the water-mains in the subways he gave satisfactory thermometer readings taken in the Albert-street subway, Nottingham. Turning next to the utility of subways, the author stated that by their construction access could be readily obtained for the purpose of inspection, alteration, or addition to any of the pipes at present hidden and placed beyond inspection. He drew attention to the fact that after works of great magnitude had been undertaken in obtaining a pure water supply to ensure the health and safety of the population, the pipes conveying the supply were hidden. Thus, a defective joint or a burst might remain undiscovered for a length of time, as was the case some years ago, when the first intimation of a leakage in the borough water-mains was reported to him by the sewer men when repairing a sewer in close proximity to the mains. An efficient system of detection and prevention of water pollution or waste would be provided for by subways, and the life of iron pipes would be considerably increased. Electric and telegraph wires need no longer run along poles and roof fixtures; they could be put underground, thus rendering them less dangerous and more reliable and permanent. Having regard to economy of cost, capability of resistance, and rapidity of execution, the author suggested concrete as the most suitable material for such works, and referred to its practical value as exemplified by its extensive use in connexion with works in general. In dealing with subways for large cities and busy thoroughfares where foot passengers experienced difficulty in crossing the street in safety, the author recommended that, in conjunction with the subway, underground conveniences should form a part of the scheme. Entrances would be erected in the centre of the street, so arranged that an easy and ready access (although private) could be gained from the first landing. This might be regarded as a peculiar suggestion, but he alluded to the revenue it was possible for it to bring in, as much as from 200l. to 2,000l. per annum having been cleared as profit for such accommodation. With regard to subways for suburban districts, the author considered all large subways should have lateral ways, about 3 ft. wide by 4 ft. 6 in. high, for the purpose of access and conveyance of gas, water, and other pipes, and he advocated making use of every available space by a specially-designed iron bracket for the pipes. The author submitted a proposal for a subway under each footpath of all new streets to receive the water, gas, and other pipes, the subways to form part of the laying-out of the new street. He considered it necessary that the gas and water mains should be in duplicate; the concrete wall nearest the house would be perforated with 2-in. and 2½-in. holes for the house services, thus obviating the construction and expense of lateral ways. The sewer would be laid under the road with the usual manholes on the principle adopted in the present day, but with the addition of elongated eyes every 20 ft., extending to each subway, the chamber (common to all house drainage) to be constructed in the bottom of the subway by and at the cost of the owner when requiring to connect with the sewer. This method he contended would ensure the surface of the road being kept free from interference. The author gave the cost of some subways constructed in London as 15l. per lineal yard, Nottingham 10l. per lineal yard, and St. Helens 7l. 2s. 4d. per lineal yard. He pointed out, however, that the information was of but little practical value and must be accepted with the greatest caution, it being

impossible to make a useful comparison between the cost of construction at other places without a knowledge of the conditions of each case. Although the initial cost would prove heavy, he pointed out that there might be some compensation if the excavated materials proved suitable for the concrete work. The author considered that the cost of constructing subways should be borne by a loan for a period of fifty years, as the works come under the category of permanent works.

METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of this Board was held at the offices, Victoria Embankment, on Saturday, Mr. Hensley presiding. The Works Committee, reporting upon the proposal to erect an isolation hospital at the Darenth Asylum, recommended that Messrs. Newman & Newman be appointed architects, and the Board concurred. The same Committee, reporting with regard to the South Wharf, Rotherhithe, recommended that the tender of Messrs. Veale & Carter, in 5,620l., for the erection of a medical officer's residence and male staff quarters be accepted. The recommendation was adopted. The other tenders were from Messrs. Lawrence & Son, Waltham Cross, 5,949l.; Jno. Appleby, Stamford-street, 6,032l.; F. & H. Higgs, Loughborough Junction, 6,331l.; W. Irwin, Essex-road, N., 6,432l.; B. E. Nightingale, Albert Works, S.E., 6,475l.; Balaam Bros., Shenton-street, S.E., 6,550l.; H. L. Holloway, Deptford, 6,560l.; Walter Wallis, Balham, 6,732l.; W. Pattinson & Son, Parliament-street, 6,784l.; Thomas Edge, Woolwich, 6,850l.; T. G. Sharpington, Nunhead, 6,890l.; Lole & Lightfoot, Chelsea, 6,897l.; G. Godson & Sons, Kilburn-lane, 7,390l.; and A. White & Co., Rotherhithe, 7,450l.

THE LONDON BUILDING ACT, 1894.

TRIBUNAL OF APPEAL CASE.

ON taking the chair at the Tribunal of Appeal under the London Building Act, on Tuesday, Mr. J. W. Penfold, the new Chairman, referred to the death of Mr. Arthur Cates, who was for some years Chairman of the Tribunal. He said he was sure that every one who had been in the habit of practising before the Tribunal would join with him in expressing deep regret at the loss of Mr. Cates. Though this was not the occasion for alluding to personal friendship, he could not help saying, speaking for himself, that it spoke much for the attractive personality of a man whom, after passing the commonly allotted term of life, one greeted with the same cordiality and esteem as when one first took his hand on entering the business of life at twenty-one or twenty-two. The late Mr. Cates' genial presence and unfailing tact and courtesy very efficiently and pleasantly controlled their proceedings. His orderly and business-like habits, his conspicuous impartiality and his firm persuasiveness when he thought the justice of the case might be met by a friendly compromise were doubtless of great advantage to those who submitted their differences to the judgment of the Tribunal, while his unique acquaintance with the details of the Building Act and his quick perception of the essential points in a case were of great value to his colleagues. As to the future, he (Mr. Penfold) said he had no doubt that the Tribunal, as now constituted, could rely on a continuance of that assistance from the representatives of both appellants and respondent which had conducted so much to the order and regularity of their proceedings.

Mr. Andrews (of the London County Council solicitors' department), speaking on behalf of those who practised before the Tribunal, endorsed the chairman's remarks, adding that he believed the traditions of the past would be fully maintained by the Tribunal as newly constituted.

The Tribunal, consisting of Messrs. Penfold, A. H. Hudson, and E. A. Gruning, then heard an appeal which stood adjourned from the 17th ult. in consequence of the death of Mr. Cates.

The appeal was that in which Mr. H. A. Woodington, on behalf of Mr. B. H. Lynch, sought to reverse the decision of the London County Council not to sanction certain deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of 19 and 20, Bateman-street, Soho, as shown upon the plans submitted by Mr. H. A. Woodington, on behalf of Mr. Lynch.

The case for the appellant was conducted by Mr. Woodington, while the London County Council and Superintending Architect were represented by Mr. Andrews, solicitor.

Mr. Woodington explained that on June 29, 1900, he sent to the District Surveyor drawings, which were certified by him. On September 20 he sent to the London County Council plans showing deviations, and a month later he received an intimation

that the Council refused to sanction the deviations proposed. He inquired by letter upon what grounds this refusal was made, but the Superintending Architect wrote back that he was not authorised to add anything to his previous letter, which merely stated that the Council refused to sanction the plans. He duly gave notice of appeal, but he was still unaware of the grounds of the Council's action, and he was at a loss to know how to go on.

Mr. Andrews said he was quite willing, with the view to expediting matters, to make any admission that might be consistent with his duty, but he thought he ought to point out that it was for the appellant to show that the Council had no good grounds for refusing to sanction the plans.

Mr. Woodington said they were proceeding under Section 43, Sub-Section 1.

The Chairman suggested that the appellant might proceed by showing what he regarded as the advantages of his proposals.

Mr. Woodington proceeded to remark that he knew that Section 4 stipulated that there should be an open space in the rear of such a building at least 10 ft. deep, but he proposed to divert this space into the area for light—which would be more than an equivalent of the space suggested under the Act. He contended that the Council should have approved of the plans because the arrangement was a reasonable one.

Mr. Andrews cross-examined Mr. Woodington on the details of the plans, and on the admissions he made, together with the facts gained by the Tribunal on a personal inspection, the Chairman intimated that, without troubling to enter upon the respondents case, they considered the appeal should be dismissed. Without calling upon Mr. Andrews, therefore, they dismissed the appeal, with ten guineas costs.

BOOKS RECEIVED.

TUNNELLING: A PRACTICAL TREATISE. By Charles Prelini, C.E., and Charles S. Hill, C.E. (Crosby Lockwood & Son, 10s.)

LAND AREA TABLES. Compiled by William Codd. (E. & F. N. Spon.)

AN ITINERARY OF THE ENGLISH CATHEDRALS, By the Rev. T. Perkins. (Geo. Bell & Son.)

DER SCHORNSTEINBAU. By Gustav Lang. (Helwingsche Verlagbuchhandlung, Hanover.)

PROCEEDINGS OF AMERICAN SOCIETY OF CIVIL ENGINEERS. VOL. XXVII: No. 5.

Correspondence.

To the Editor of THE BUILDER.

HOLIDAYS FOR THE POOR.

STR.—There are few people who work harder, and who deserve to enjoy their holidays more, than your readers, and it is on a question of holidays that I wish, with your permission, to appeal to them. There are thousands of children in the London slums who have never seen the sea, and have never played in a green field. Poverty keeps them tied to their close and unhealthy courts and alleys. The Ragged School Union is "opening up the country" to these children by means of their seaside holiday homes, and each year it provides a fortnight's holiday for some thousands of them. The cost of such a holiday is only 10s. per child—a comparatively small amount in the expenses of the average holiday-maker. Last year we sent over 6,200 children for a holiday; this year we hope to increase the number. Will your readers help us? I shall be happy to receive and acknowledge all subscriptions sent to me.

JOHN KIRK.

Ragged School Union and Shaftesbury Society,
72, John-street, Bedford-row, W.C.

DAMP BRICK WALLS.

STR.—Would any of your readers kindly reply, giving a good remedy for dampness of brick walls, to be applied in solution on the outside of bricks that absorb the rain water, which goes through into the house?
A SUFFERER.

CHURCH, TOLL-CROSS, LANARKSHIRE.—St. Margaret's Established Church, Tollcross, which has just been completed, was dedicated on the 31st ult. The church is built on a site south of the railway at Tollcross Station, fronting Braidford-road. The style is Late Gothic. The building will afford accommodation for 322 persons. Ground is also reserved on the north side for nearly doubling this accommodation, and on the east for building a small hall and session-house. The plan consists of a nave with aisle and a chancel or choir raised one step above the floor of the nave. The main entrance is by a porch at the south-west corner, which communicates with nave and aisle. The pulpit is on the north side of the nave, and is of stone. The architect was Mr. W. G. Rowan, Glasgow. The church is intended to cost about 2,300l.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

21.—THE UNSEALING OF TRAPS.

UNDER certain conditions, trap-ventilation is absolutely necessary in order to prevent the seal of the traps being destroyed by the ordinary use of the fittings, but ventilation is of no use in preventing loss of seal in what may be termed extraordinary cases. If a fitting is not used for a long time, the water in the trap may evaporate, and this evaporation will be hastened by the current of air induced by the trap-ventilating pipe. Again, the contents of a trap may be partially or wholly drained away by a piece of rag lying with one end in the trap and the other in the waste-pipe. Evaporation cannot, of course, be prevented, but it can, to some extent, be checked by keeping the plug in the washer in the case of fittings where plug-wastes are adopted, but this destroys the polish and ultimately injures the wood. The retention of pieces of rag in the outlets of traps may be guarded against by having the traps of self-cleansing shape and adequately flushed. The standing water in a trap may also be lowered by strong winds blowing across or down the open end of the ventilating pipe. The most common causes of loss of seal are, however, siphonage and momentum. Strictly speaking, of course, the term "siphonage" ought to be confined to those cases in which the contents of the trap are drawn out below the level of the outlet by siphonic action, and "momentum" to those in which the contents are carried over the outlet by the momentum of the water entering the trap. A round-pipe trap fixed under a valve closet is very liable to unsealing, and in this case the unsealing is largely due to the momentum gained by the water in falling from the valve to the level of the trap. It is obvious that the momentum is not reduced by ventilating the trap. It is equally obvious that a large body of standing water in a trap checks the force of the flush and at once reduces its momentum. If the standing water falls below a certain level it does not offer sufficient resistance, and the trap may be unsealed by momentum. Water-closet traps, which are quite safe under ordinary circumstances, may be unsealed by pouring into them a number of pailfuls of water or slops. The momentum of the first pailful will be considerably reduced by the normal quantity of standing water, with the result that this may be only slightly lowered. The second pailful, meeting with slightly less resistance, will lower the level of the standing water to a still greater extent, and so on until the trap is unsealed. In a wash-down closet with P trap and 1½-in. seal, tested by the writer, the second pailful unsealed the trap. This cumulative effect of successive discharges must be borne in mind in examining water-closets which are also used as slop-hoppers. The effect of a pailful of water rapidly emptied into the basin is much more severe than that of the normal flush discharged through a pipe only 1½ in. or 1¼ in. in diameter.

Although the momentum of the falling water undoubtedly plays a considerable part in lowering the standing water in traps, thorough unsealing is seldom effected unless siphonic action is brought into play, and it is practically impossible to distinguish in every case between the two causes of failure. To avoid unnecessary verbiage, the term "siphonage" will be employed whether the unsealing is due to siphonic action or momentum, or to both.

It cannot be said that a complete series of tests, sufficient to demonstrate the advantages and disadvantages of different forms of traps, has yet been carried out. Tests carried out by the makers of a special trap will naturally be regarded as less authoritative than those carried out by independent witnesses. A committee of the Sanitary Institute* has recently experimented with two forms of water-closet traps—the round-pipe "Dubois" P trap, and the "Anti-D" trap—and as far as these traps are concerned, the tests are fairly complete, and are of sufficient value to merit detailed notice. The apparatus (fig. 1) consisted of a 3½-in. lead soil-pipe 30 ft. 8 in. high, with 3½-in. branches to two short-hopper closets with circular outlets, the upper outlet being 3½ in. and the lower

3½ in. in diameter. The two closets were placed on the ground floor and first floor respectively, and in each experiment both closets were fitted with similar traps. The Dubois ordinary traps were 3½ in. in diameter, with 1½-in. seal, and contained 60 ozs. of water. The Dubois deep-seal traps were of the same diameter, but with a seal of 2½ in. on the lower basin and 2½ in. on the upper basin, the traps containing 60 ozs. and 64 ozs. of water respectively. The Anti-D traps were also 3½ in. in diameter, with seals of 1½ in. on the lower basin and 2 in. on the upper basin, and each contained 40 ozs. of water. The water was emptied into the basins from a pail, six experiments being made in each case. This is, of course, a severer test than would have been obtained by the use of a flushing cistern. Valves were fitted in the anti-siphonage pipes and soil-pipe, as shown in the illustration, so that these could be closed as required for different experiments.

When the soil-pipe and anti-siphonage pipes were open the discharges had practically no effect on the traps, but when these pipes were closed all the traps on the upper basins were unsealed by the discharges through the same basins, while discharges through the lower basins lowered the water in the traps of these basins but did not unseat them. The mean results are shown graphically in fig. 2 by the thick horizontal lines, and the maximum results by the black dots. The normal depth of seal is represented by the vertical dotted lines, and the loss of seal by the vertical full lines; the cross-hatching represents the depth below the dip to which the water was lowered in those cases where the traps were quite unsealed. In the tests marked A the anti-siphonage pipes and soil-pipe were open, in those marked B the anti-siphonage pipes were closed and the soil-pipe open, in those marked C the anti-siphonage pipes were open and the soil-pipe closed, and in those marked D the three pipes were closed.

It will be observed that, with the exception of a single test, the traps attached to the upper closets were the only ones unsealed, and that the unsealing occurred only when the water was poured into the upper basins. The sole exception was in the case of the Anti-D trap, the maximum siphonage (with a three-gallon flush in the upper basin) lowering the water of the lower trap exactly to the bottom of the dip when all the pipes were closed.

The tests were not sufficiently complete to allow a final comparison to be made between the two traps, but as far as they go, they show that neither trap can claim superiority under every condition. When the anti-siphonage pipes and soil-pipe were open both traps retained practically the full depth of seal in every case. When the anti-siphonage pipes were closed and the soil-pipe open there was little difference between the traps under the following conditions—(1) when fitted to the lower basin and tested by discharges through either the lower or upper basin, and (2) when fitted to the upper basin and tested by discharges through the lower basin; but when fitted to the upper basin and tested by discharges through the same basin the Anti-D trap had a decided advantage, the seal remaining practically intact, while the Dubois trap was unsealed time after time. When the anti-siphonage pipes were open and the soil-pipe closed both traps were satisfactory and gave almost identical results. With the anti-siphonage pipes and soil-pipe closed, both traps, when fitted to the upper basin and tested by discharges through the same basin, were unsealed; when the traps were fitted to one basin and tested by discharges through the other basin the Dubois trap gave uniformly better results than the Anti-D trap; but when the traps were fitted to the lower basin and tested by discharges through the same basin the Anti-D trap was decidedly superior.

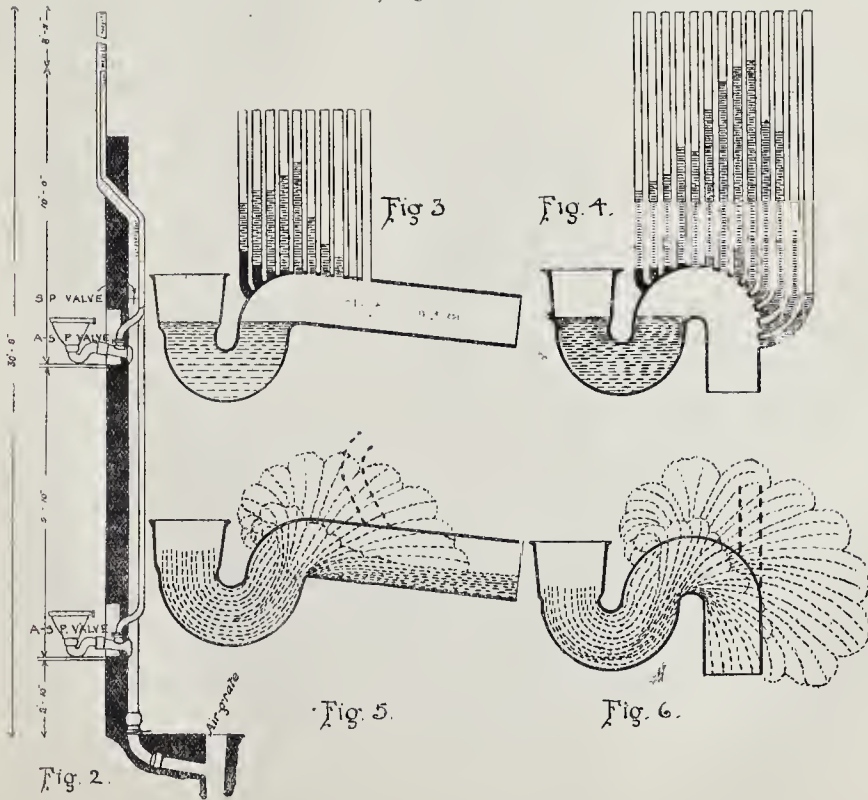
It would have been more satisfactory if additional tests of the upper traps had been made with the branches from the lower traps closed, and *vice versa*, and also if a complete series of tests had been made with the air-grating at the foot of the soil-pipe closed. The foot-ventilation of the soil-pipe is a feature not often adopted in current practice, and renders the tests less useful than they would otherwise have been.

The tests illustrated in fig. 2 refer to the Dubois trap with ordinary seal. The deep-seal trap fitted to the upper basin and tested

* See the "Journal" of the Sanitary Institute, April, 1901.

	Flash in gals	Dubois				Anti-D				depth in in.	Flash in gals	Dubois				Anti-D				depth in in.
		A	B	C	D	A	B	C	D			A	B	C	D	A	B	C	D	
Water into Upper Basin Effect on Upper Trap	2	[Diagram]				[Diagram]				0	[Diagram]				[Diagram]				0	
	3	[Diagram]				[Diagram]				1	[Diagram]				[Diagram]				1	
Water into Lower Basin Effect on Lower Trap	2	[Diagram]				[Diagram]				0	[Diagram]				[Diagram]				0	
	3	[Diagram]				[Diagram]				1	[Diagram]				[Diagram]				1	
Water into Upper Basin Effect on Lower Trap	2	[Diagram]				[Diagram]				0	[Diagram]				[Diagram]				0	
	3	[Diagram]				[Diagram]				1	[Diagram]				[Diagram]				1	
Water into Lower Basin Effect on Upper Trap	2	[Diagram]				[Diagram]				0	[Diagram]				[Diagram]				0	
	3	[Diagram]				[Diagram]				1	[Diagram]				[Diagram]				1	

Fig. 1.



Illustrations to Student's Column.

by discharges through the same basin gave better results when the soil-pipe was open and the anti-siphonage pipes closed, but was unsealed time after time when all the pipes were closed. Under other conditions, the ordinary trap gave, on the whole, as good results as the other.

Many old soil-pipes are trapped at the foot. This trap is a source of danger, especially if two or more closets on different floors are connected to the soil-pipe. When the uppermost closet is discharged the water acts as a piston in the soil-pipe, and must expel part of the air in the soil-pipe either through the trap at the foot or through the trap of one of the lower closets. As the latter generally offers less resistance, the air (fouled by the soil-pipe) is driven into the building. The force of the upper discharge is sometimes so great as to eject a considerable portion of the contents of the lower trap on to the floor of the room; in other cases, the water in the trap may be merely raised in the basin, but the momentum gained in falling back will carry part of the water out of the trap into the soil-pipe. Thus the trap may be either partially or wholly unsealed.

It is unnecessary to describe in detail other conditions which lead to the unsealing of traps. The principal points to be borne in mind are the necessity of trap ventilation (especially when the waste-pipes or soil-pipes are of great length or receive the discharges from two or more fittings), the importance of confining the waste-pipes and soil-pipes (but particularly the latter) upwards to serve as ventilation pipes, and the danger arising from trapping the lower parts of waste-pipes and soil-pipes.

The position of the anti-siphonage pipe requires some consideration. According to the by-laws of the London County Council, an anti-siphonage pipe should be connected with the branch pipe at a point not less than 3 in., and not more than 12 in. from the highest part of the trap—of course, on the soil-pipe side of the standing water. If the anti-siphonage pipe is connected too near the highest part of the trap, the end will be fouled, and perhaps ultimately "furred up," by the discharges from the fitting rising into the pipe; if it is connected to the branch pipe at too great a distance from the trap, it will be of little use in preventing siphonage. The Committee of the Sanitary Institute already referred to carried out other experiments with the view of determining the best position for the anti-siphonage pipe. Dubois traps of P and S shape, and $3\frac{1}{2}$ in. and 4 in. in diameter, were tested by fitting them to a short-hopper closet with $3\frac{1}{2}$ -in. circular outlet, and by flushing the closet (1) with 2 gallons of water "thrown into the basin from a pail" and (2) with discharges from a 2-gallon siphon cistern fixed 4 ft. 9 in. above the top of the basin, and connected to it with a $1\frac{1}{2}$ -in. lead flush-pipe. Glass tubes were fitted to the traps in various positions, so that the height to which the water rose could be observed. "Only one tube was fitted at a time, the other openings being carefully closed." Figs. 3 and 4 show the results obtained with $3\frac{1}{2}$ -in. traps, the P-trap having a seal of $2\frac{1}{2}$ in. and the S-trap a seal of 2 in. The shaded portions represent the maximum heights (out of six tests in each case) to which the water rose in the tubes, when the flush was thrown from a pail, and the black portions give the maximum results obtained when the closet was flushed from the cistern. These tests show that, for a closet used as a slop-hopper, the crown of the trap is not a suitable position for the anti-siphonage pipe. The further tests, illustrated diagrammatically in figs. 5 and 6, were made by cutting a slit $1\frac{1}{2}$ in. wide along the top of each trap, and observing the extent of the splashing. The light lines show the results when the closets were flushed from a pail, and the dark lines those obtained when the cistern was used. It is clear from these illustrations that the anti-siphonage pipe will be seriously fouled if it is connected at right angles to any line tangential to the curve of the trap. The thick dotted lines in figs. 5 and 6 show how the anti-siphonage pipes may be connected so that the risk of fouling is minimised.

In concluding this account of the Committee's experiments, it ought to be stated that the bare facts only are recorded in the "Journal" of the Sanitary Institute, and the Committee cannot therefore be held responsible for the deductions which the writer has drawn from these facts.

OBITUARY.

MR. W. J. HOPKINS.—We have to record the death, on the 28th ult. at Sansone Lodge, Worcester, of Mr. William Jeffrey Hopkins, aged eighty, Fellow of the Institute of British Architects, and Diocesan Architect of Worcester. In our issue of November 10, 1898, we recorded the restoration of the ancient wayside cross at Eckington, Worcester, after the design of Mr. Hopkins; the base and a portion of the shaft alone remained, and he renewed the upper portion and added a cross as a finial. He was architect of Hallow Church near Worcester, commenced in 1879, which he completed by the addition of a spire in 1900.

MR. G. E. WALLIS.—Alderman G. E. Wallis, builder and contractor, died on Friday morning, the 31st ult., at his residence, "Elverton," Boxley-road, Maidstone. Mr. Wallis was born at Boxley on August 6, 1823, and came to Maidstone when a boy, starting life as a journeyman plasterer and bricklayer, and when only nineteen years of age entered into matrimony, his wife being the daughter of his then employer, Mr. William Bow, who was the originator of the artificial stone manufacture. Eventually Mr. Wallis succeeded to the business, and in 1860, in partnership with the late Mr. Jas. Clements, started as building contractor, and in the course of nearly thirty years, during which the partnership existed, carried out many important works, including additions to Barming Asylum, and Kingsnorth Industrial Schools, and other works for the county of Kent, mansion at Boxley for Major Best, St. Faith's and St. Phillip's Churches, Maidstone, and schools for most of the parishes of Maidstone and vicinity, Framlingham Brewery, &c. In 1889 the partnership was dissolved, and in conjunction with his three sons the firm of G. E. Wallis & Sons was formed, and a larger sphere of operations entered into, comprising large War-office contracts at Shorncliffe, Aldershot, Lydd, &c., work for the London School Board, &c. The deceased took an active part in municipal affairs, having been a member of the Town Council for the last twenty-five years, also a Guardian of the Poor and a Governor of the Grammar School, and warden of his parish church. He was also a prominent member of the Masonic fraternity, being P.M. of the Belvidere (503) Lodge and P.Z. of the Belvedere Chapter, holding the office of Treasurer at the time of his death. He was also an enthusiastic musical amateur, and performed on the violoncello with quite exceptional ability, his knowledge of the instrument being entirely self-acquired, and his devotion to it remained to the last, he having formed one of a quartette party only the night before his decease.

GENERAL BUILDING NEWS.

PRESBYTERIAN CHURCH, MUSWELL HILL, N.—The design submitted for this church in a recent competition (limited to five architects), under motto "New Era," has been adopted, and the authors of the design, Messrs. George Baines and Reginald Palmer Baines, Clement's-inn, Strand, W.C., have been instructed to proceed with working drawings. The style adopted is a free treatment of the Perpendicular period of Gothic architecture. Externally the building is to be faced with whole white flints, the dressings being of red Costessey work. A square tower, terminating in a spirelet, forms a prominent feature at the angle of the block, the site being at the corner of two roads. There are three moulded doorways in front, flanked by buttresses; a seven-light traceried window is in the central gable, and traceried work in the apex of gable. The plan approximates in form to a Greek cross. The ceilings internally will be vaulted in wood, the large central vault being carried up higher than others for effect and better ventilation, and being carried upon clustered green marble columns, with moulded stone bases and carved stone capitals. These support four main moulded arches, and other smaller ones spanning the in moulded arches, and other will all be filled with ornamental lights. Electric lighting is arranged for, and low-pressure hot-water heating apparatus will be provided. Seating accommodation will be: on ground floor, 750; in front gallery, 100; total, 850, or a mixed congregation of about 1,000 persons.

CHURCH OF ST. JAMES, MUSWELL HILL, N.—The first portion of this church, consecrated on May 25 by the Bishop of London, consists of the chancel and morning chapel, and two bays of nave and aisles, together with vestries and organ transept. When completed the nave will be 96 ft. by 30 ft., inside dimensions, and aisles of same length by 13 ft. wide. The chancel is 40 ft. by 28 ft., and morning chapel 40 ft. by 15 ft. 3 in. The choir and clergy vestries are divided by a movable screen, and will form a parish hall when the screen is folded back. The style of the church is Perpendicular Gothic, which admits of large windows and very ample lighting, and this has been fully availed of in this case, in view of possible gifts of stained glass and the reduction of light which would inevitably follow from its use. The walls are faced inside with sawn Ancaster stone, and similar stone, roughly faced, is used for the outside casing of walls. The moulded pillars, arches,

and traceried windows, doorways, &c., are of selected Bath stone, twice coated with fluate of magnesia, to prevent risk of decay. The roofs are all open-timbered, of pitch-pine, those to nave and chancel and chapel being of circular barrel-shape, and panelled by means of principals and ribs. The floors in chancel and passages are paved with marble mosaic, those under seats with maple wood blocks. Canadian oak seats and clergy and choir stalls are provided. Seating for 950 persons will be provided in the completed church; the present seating is for about 500. The cost of the present portion of the church is about 6,500. The complete church, exclusive of the upper part of the tower and spire, will cost about 13,000, and it is intended to proceed with the erection of the remaining portion of the nave and aisles, and the lower part of the tower as soon as the original old Chapel-of-Ease has been removed. The architect is Mr. J. S. Alder, of Arundel-street, Strand, W.C. The builder is Mr. John Bentley, of Waltham Abbey.

WESLEYAN CHAPEL, BIRKENSHAW.—A new Wesleyan chapel is in course of erection at Westgate-hill, Birkenshaw, on a site close to the old chapel. It is proposed to spend 4,000l. in erecting and completing the new chapel, in addition to which amount 2,000l. is required to convert the old chapel into a schoolroom and to build a caretaker's house. From one of the front corners of the building will rise a decorative spire to a height of 100 ft. The chapel will comprise nave, chancel, and transepts. The two front entrances will communicate with a central vestibule, which will be covered by a small end gallery sufficient to accommodate ninety persons, and the body of the chapel will provide seating for 454 persons. The ceiling of the nave and transepts will be trefoil in form, and all the windows will have stone tracery heads and will be filled with leaded lights. The heating will be by means of hot-water pipes on the low-pressure system. Messrs. Walker & Collinson, Bradford and Morecambe, are the architects, and the work is being carried out by the following firms:—Messrs. John Brown & Sons, Bingley, masons; Messrs. H. & T. Riddiough, Cross Hills, joiners; Messrs. G. & R. Minus, Rawdon, plumbers; Messrs. Charles Howroyd & Son, Bradford, plasterers; Mr. T. Thornton, Shipley, slater; and Mr. T. Batty, Drighlington, painter.

RESTORATION OF ST. PETER'S CHURCH, RINGLAND, NORFOLK.—At St. Peter's Church, Ringland, on the 4th inst., a special service was held to mark the completion of the restoration of the church. The church has just received a new oak pulpit, surmounted on a moulded stone base; the chancel fittings include the ancient poppy-headed bench ends, worked as ends to new choir seats; the old deal communion rail with balustrading has been replaced with a well-designed oak rail on circular columns and supported by traceried spandrels. The work has been designed by Mr. Arthur J. Chambers, architect, of Norwich, and carried out by Mr. Robert Wegg, builder, Norwich.

NEW WING, STAVELEY GRAMMAR SCHOOL, DERBYSHIRE.—A new wing has been added to Staveley Grammar School. It contains manual instruction-room, lecture theatre, cookery-room, physical and chemical laboratories, and balance-rooms. On the main staircase of the new building have been placed the several coats of arms of the respective founders of the institution. The building was designed by Mr. W. Cecil Jackson, architect, Chesterfield, and Mr. Wm. Forrest, of Chesterfield, has had the contract for erection.

NEW BOARD SCHOOL, ABERDEEN.—On Monday there was opened at Mile-end, Stockel, the new public school just finished for Aberdeen School Board. The building is of granite, and is three stories in height, occupying a site in line with Queen's Cross and Fountain-hall-road. The walls of the two lower floors are of hammer-blocked ashlar, and the upper part of the building of picked ashlar. In the basement are a Cornish steam-boiler and a large air-propeller driven by a Tangye gas-engine, and all the arrangements for mechanical ventilation and heating of the entire building have been taken charge of by Mr. J. Ogg Allan, architect for the School Board. The total cost of the building, the architect of which is Mr. A. H. L. Mackinnon, Aberdeen, will be about 12,000l. The school will accommodate 120 pupils, and the contractors have been:—Masonry work, Jas. Gauld; carpentry work, A. Hall; slating work, Adam & Co.; plastering work, Stephen & Gibb; plumbing work, J. F. Adams; painting work, J. Mason & Son; heating work, R. Tindall; desks and furnishings, J. Garvie & Sons; electric lighting, Shirras, Laing, & Co., Limited; tar macadam, J. McAdam & Co., all of Aberdeen.

CHAPEL, COWLEY POOR LAW SCHOOLS, OXFORD.—The new chapel which has recently been erected at the Cowley Poor Law School has just been dedicated. The chapel, the designs for which were executed by Mr. W. H. Castle, the City Estate Surveyor, is situated on the south-west side of the school, and is 47 ft. by 22 ft. The accommodation provided is for 143 children, the construction of the chapel being such that, if necessary at a future date, the building may be enlarged by the addition of a chancel. The main entrance is on the west side, but when the weather will not permit of the children walking in procession, a corridor connecting the school and the chapel will be available. The building is erected with local

stone, similar to that used for the school, the dressings being of Bath stone. The work has been carried out by Messrs. T. H. Kingler & Son.

COUNCIL CHAMBER, WYBBY.—A block of new buildings has just been completed for the Whitley and Monkseaton Urban District Council. The walls of the building are faced with deep red pressed bricks, the dressings being of stone. Upon entering the entrance hall the offices of the clerk and the rate collector are found on the right hand, and those of the surveyor and the sanitary inspector on the left. At the back is a living-room and a kitchen with scullery and the accommodation for the caretaker. On the upper floor is the Council chamber, 30 ft. long by 18 ft. 6 in. wide, and 15 ft. high. Behind the Council chamber is a waiting-room, with lavatory and other accommodation. These rooms take up the space on one side of the staircase, and on the other side are two committee-rooms. Connected with the Council chamber is a cloakroom. Above these rooms there are three attic bedrooms for the caretaker. These constitute the main block; but there are, besides, two separate out-buildings, one being the fire brigade house and the other is to provide storage. The whole of the works have been designed by Mr. J. P. Spencer, architect, of Newcastle and North Shields, under whose supervision they have been carried out by Mr. James Douglas, contractor, of Cullercoats.

BUILDING IN ABERDEEN.—There has recently been a revival in the house-building trade in Aberdeen, and a great many villas and mansion-houses are now being erected in the west-end suburbs, while towards the centre of the city numerous business premises are being rebuilt or improved. There is also a good prospect of work in the construction of public buildings, and the present boom promises to last for three years at least.

ELECTRIC LIGHTING WORKS, ROTHERHAM.—The opening of the electric light and power station erected by the Rotherham Corporation took place on the 23rd ult. at the new works, Rawmarsh-road. The buildings, the architect for which was Mr. J. Platts, are built of pressed bricks, with stone and buff terra-cotta dressings, the insides of the walls having glazed brick dados. The principals are of wrought iron, with pitch-pine boarding, varnished. The engine-room floor is laid with encaustic tiles, the battery-room with acid-resisting asphalt, and the passages and lavatories with terrazzo pavement. The switchboard platform is of white glazed bricks, with wood-block flooring and teak handrail and cast-iron standards. The site is enclosed with a brick boundary wall. The chimney is 162 ft. high. The boiler lodge for condensing purposes is 167 ft. long by 16 ft. wide, with a holding capacity of 220,000 gallons. The terra-cotta was provided by Mr. Jabez Thompson, of Northwich, and iron roofs by Newton, Chambers, & Co.

MIDLAND RAILWAY INSTITUTE AT DERBY.—An extension has just been made to the institute which was erected at Derby by the directors of the Midland Railway Company for the benefit of the staff in 1897. The building, which is situated close to the Midland station, originally included a reading and magazine room, a lending and reference library containing about 14,000 volumes, a restaurant, billiard-room with three tables, and a large concert-hall with proscenium and scenery. The new extension comprises a dining-hall capable of seating about 200, where dinners will be served daily, with an adjoining dining-room of smaller dimensions. On the ground floor is a new restaurant for the salaried staff of the company, and a café for the workmen, with connecting service-rooms and kitchen fitted with the most modern cooking appliances. Lavatories with hot and cold water are annexed. The new extension has been designed and carried out under the direction of the company's architect, Mr. C. Trubshaw.

TECHNICAL COLLEGE, DURHAM.—The new technical college at Durham, which is to be known as the Johnston Institute of Science and Art, was opened on the 22nd ult. The front of the college is in South-street. The building, which is three stories high, occupies a large site, and on the east side overlooks the wooded banks of the River Wear. It has been built on designs by Messrs. Oliver, Leeson, & Wood, architects, of Newcastle, by Messrs. J. G. Graddon & Son, contractors, of Durham. It is of red brick, with a tiled tile roof, and a main entrance in South-street of stone. The upper apartment is intended for the art classes, the middle floor for chemistry and engineering, and the basement for physics, cookery, &c. There are large classrooms and accessory apartments, well equipped for the proper study of science, art, and technical subjects.

NEW PUBLIC HALL FOR HULL.—At a recent meeting of the Hull Corporation Property Committee Mr. Hirst, City Architect, reported that he had interviewed the Corporation's tenants in Waterworks-street, Junction-street, St. John-street, and Charlot-street. It was proposed to take down all the old buildings, to provide a large square close to the Monument, and to erect thirty-four shops, some with ground floor and basement only, and others with four floors. There were also provisions for a public hall, sitting-rooms, and three large reception-halls. The halls were to be on the first floor, with a main entrance from the square, and eight subsidiary entrances and exits in Waterworks-street

and St. John-street. The large hall, which would accommodate 3,000 persons, would have side and rear galleries and an orchestra. It was proposed to carry the buildings out in two portions, commencing at the square. Provision being made during the reconstruction for the older tenants, to whom option of position would be given when the buildings were completed. The square would measure 272 ft. from north to south, and 216 ft. from east to west, and would form an open space in the very heart of the city. The approximate estimate for erecting the building, including the purchase of necessary land, is 92,000*l.* The estimated rentals from the new shops, including two licensed houses to be rebuilt, one of which could be used in connexion with the public hall, is 6,836*l.*, and for the public hall, 1,014*l.*; increase of rents on shops, 632*l.* It was moved by the Chairman and seconded by Councillor Skinner that the scheme be approved, and it was unanimously carried.

TOWER, PARISH CHURCH, BROUGHTON-IN-FURNESS.—The new tower to the ancient parish church of Broughton-in-Furness and the new peal of bells were dedicated on the 27th ult. by the Bishop of Carlisle. The tower was designed by Messrs. Austin & Paley, of Lancaster, and is in keeping with the Norman architecture of the church. The new bells are eight in number.

MISCELLANEOUS.

PROPOSED COUNCIL HALL FOR MARYLEBONE.—We hear that the Improvements Committee of the St. Marylebone Borough Council have recommended the acquisition of a fresh site for a County Hall, to include a hall for public meetings, instead of the present Court House and Vestry offices at the south end of Marylebone-lane, near Oxford-street. The site in question extends over 28,000 ft. superficial, and is situated between Circus-street and Wyndham-street, Marylebone-road, near Bryanston-square.

SPITALFIELDS MARKET.—Mr. Hargreaves Brown's Select Committee of the House of Commons have passed as proved the preamble of the London County Council Bill for the purchase of the freehold and leasehold interests in Spitalfields Market, which is at present held upon an eighty-four years lease from 1882 at an annual rent of 5,000*l.* The Select Committee's decision disposes of the Bill promoted by the Corporation of London for the same purpose. In each case we gather the promoters had made a provisional agreement to acquire all existing rights and franchises of the market and its site for 176,750*l.*, together with 1 per cent. upon the purchase moneys for the costs, as agreed upon, of the vendors. The Committee were of opinion that (1) the rights of Stepney to become the market authority should be preserved; (2) the right of the City of London under their charter of 1267, Edward III. should be preserved as it was by Section 41 of the Act of 1851; and (3) whilst that particular market could be best dealt with by the County Council, the County are not a market authority for the metropolis; and (4) the measure must not be regarded as a precedent in any way.

SHADWELL FISH MARKET.—Mr. Brown's Select Committee of the House of Commons has passed as proved the preamble of the Bill introduced by the Corporation of London for purchasing the riverside fish market at Shadwell. They at the same time agreed to insert a clause which shall stop the Corporation from preventing the West Ham Borough Council from establishing and maintaining a market within the county borough. The market at Shadwell was established by a company under the powers of an Act passed in 1882. Though the Corporation opposed that measure at the time, upon the grounds that their intended improvements at Billingsgate would meet all requirements of the fish trade, they have since become owners of the market, and have agreed to take it over at the price of 175,000*l.* Under their present Bill, against which the London County Council have petitioned, the Corporation take powers for a ratification of their purchase, the widening of the High-street, Shadwell, the improvement and enlargement of the market, and the erection of houses to be let at moderate rents to the working classes.

THE STRAND AND THANET-PLACE.—On Monday, 10th inst., will be offered for sale at auction the site, upon a building lease for eighty years (with the option of acquiring the freehold), of Nos. 231 and 232, Strand, and the whole of Thanet-place in the rear, covering an area of more than 8,500 ft. superficial, opposite the Courts of Justice. The freehold of the nine houses in Thanet-place, occupying an area of 7,800 ft. superficial, and yielding a rental of 550*l.* per annum, was sold on November 30, 1898, for 20,500*l.* Thanet-place, named after the Tuttons, Earls of Thanet, marks the site of the Rose Tavern, cited for its vine-tree and garden in Thomas Fairchild's "City Gardener," 1722; in two letters written to Cole in 1776 Walpole refers to the painted room at the Rose Tavern without Temple Bar.

THE LATE MR. J. M. BRYDON.—The following gentlemen, among others, were present at the funeral of the late Mr. J. M. Brydon on the 20th ult.—Mr. Wm. Emerson, President of the Royal Institute of British Architects; Professor Atclison, past-President; Sir L. Alma-Tadema, R.A.; Sir

John Taylor; Dr. Murray (British Museum); Dr. Rowland Anderson; and Messrs. Aston Webb, A.R.A.; John Belcher, A.R.A.; Leonard Stokes; T. W. Cutler; W. D. Carpe, F.S.A.; H. B. Wheatley, Society of Arts; Edwin T. Harcourt, H. H. W. Seth-Smith, President of the Architectural Association; Ernest George, and W. J. Locke, Secretary R.I.B.A.

THE CARLTON HOTEL, LIMITED.—A subscription list has been opened of 300,000*l.* 4 per cent. first mortgage debenture stock of this Company, which was formed in 1869 for acquiring the Carlton Hotel and adjoining property in the Haymarket and Pall Mall, comprising the Carlton Hotel, His Majesty's Theatre, and the Royal Opera Arcade, which are held under a lease from the Crown to the Company for a term of 72 years from October 10, 1898, at a yearly rent of 4,200*l.*, underleasess of the theatre (at a rent of 3,700*l.* per annum) and of the arcade with other minor parts of the property (at peppercorn rents) having been granted for the whole of that term—a few days excepted. In May last Messrs. Farnbrother, Ellis & Co., acting for the Company, valued the property, with furniture, effects, and other assets, at the sum of 650,000*l.*, and the Company state that their net trading profits during the period July 15, 1899—August 31, 1899, amounted to upwards of 50,000*l.* The Carlton Hotel was opened on July 15, 1899, having been erected upon a site of about 23,500 square feet from drawings made by the late C. J. Phipps; the completion of the fabric (with modified plans for the interior) was carried out by Mr. L. H. Isaacs and Mr. H. L. Florence, the decorations and equipments being by Messrs. Waring & Gillow. His Majesty's Theatre (illustrated in the *Builder*, May 8, 1897) was built from the designs and under the direction of C. J. Phipps, with whom was associated Mr. R. Walker for the internal decoration and scheme of colour; the general builder's work being by Mr. Lovatt. The Arcade was given to the Company by the late King's Theatre or Italian Opera House, as part of the alterations and improvements, made in 1816-17 by John Nash conjointly with G. S. Repton, of the building (1790-1) designed by Michael Novosielski.

LIGHT RAILWAYS IN THE ENVIRONS OF LONDON.—Applications have just been made to the Light Railways Commissioners by the County Council of Middlesex for the construction and working of a large number of light railways in the Counties of London, Middlesex, and Hertford, comprising new lines in the parishes of Islington, Hornsey, Tottenham, Friern Barnet, Southgate, Finchley, Hendon, Willesden, Acton, Brentford, Ealing, Wembley, Harrow, Great Stanmore, Harrow Weald, Hampstead, Chiswick, Staines, Sunbury, Hampton, East Twickenham, Heston, Cranford, Twickenham, and others adjacent. A gauge of 4 ft. 8½ in. is adopted. The motive power proposed to be used is animal power, or electrical power applied upon a system approved by the Board of Trade, or any mechanical power other than steam power. For purposes of power stations, car depots, and other buildings, the promoters seek to acquire sites in Redbourne-avenue, Finchley (about 3 acres), Port-lake, Sunbury (10 acres), at Bull's Bridge, Norwood, Middlesex (10 acres), and on the Bath-road, Heston (8 acres). With two or three exceptions, where fields are to be traversed, the lines will be laid along streets or roads or waste lands by the roadside. For the widening of roads where necessary so much property will be taken as may be needed for making up the metalled portion of the road to a minimum width of 32 ft. between the kerbs, and for providing a footpath along each side of the road from 6 ft. 6 in. to 10 ft. wide. Where fields are crossed (as at Heston, Bedford, Old Oak-lane, Willesden, and the Alexandra Park Estate) permanent way, 24 ft., will be made across them.

EMIGRATION IN THE BUILDING TRADES.—According to the annual report of the Board of Trade on emigration and immigration, the male adults who left the United Kingdom in the year 1900 included 158 builders; 708 bricklayers, masons, plasterers, slaters, &c.; 37 brick and tile makers, potters, &c.; 1,089 carpenters and joiners; and 428 painters, paperhangers, plumbers, and glaziers. Of this total of 2,470, British North America was the destination of 121, Australasia of 245, and the United States of 1,055, whilst 998 went to "other places."

ELECTRIC LIGHT WORKS, PERTH.—The new electric light station buildings, Perth, erected from plans prepared by Mr. R. McKillop, the Burgh Surveyor, under the direction of the consulting engineer, Mr. W. C. C. Hawtayne, M.I.E.E., London, are of red facing brick. They are situated at the harbour road, adjoining the River Tay. They comprise an engine-room, 115 ft. long by 38 ft. wide; a boiler house, 115 ft. long and 42 ft. wide; and an accumulator room, 48 ft. long by 31 ft. wide. The test room and offices are to the front, and over these a dwelling house is provided for the engineer who will look after the works. The cost of the new work and installation is about 40,000*l.*

PROPOSED MEMORIAL TO PROFESSOR ANGEL.—It is proposed to found a prize or scholarship in memory of the late Professor Angel, who was for many years instructor in steam, applied mechanics, and practical plane and solid geometry, at the City of London College City Polytechnic. Former pupils and others who wish to subscribe to the fund are requested to communicate with Mr. P. J. Gillbard, Hon. Secretary to the "Henry Angel

Memorial Fund," City of London College, White-street, E.C.

BERLIN INTERNATIONAL FIRE EXHIBITION.—The attention of the British Fire Prevention Committee having been called to the fact that the lack of enterprise on the part of the English fireproofing and fire appliance trade had resulted in this country being scarcely represented at the Berlin International Fire Exhibition, steps have now been taken to see that Great Britain is at least represented by some scientific exhibits. A large stand has now been retained by the Committee to show photographs, plans, &c., of such materials and systems of construction as have been before the Committee for investigation, and a number of models are also being sent to Berlin. Further, some large plans and drawings of London fires are being shown, together with a very interesting collection of old insurance plates. Although the British Fire Prevention Committee has from patriotic motives tried to step into the breach at short notice with exhibits arranged from a scientific point of view, the lack of enterprise on the part of the trades concerned is highly regrettable, as the natural result can only be that much of the business to which Great Britain might well lay claim must again drift into the hands of the more energetic foreign competitors who have taken the pains to show what they can do in meeting the requirements of fire protection.

NEW PIER, MINEHEAD.—On the 25th ult. a new pier was opened at Minehead. The pier is 700 ft. long and 24 ft. wide at the narrowest width, and it is widened out at the head to a width of 76 ft., the level of the deck being about 20 ft. above high water of ordinary spring tides. In addition to the widening at the head of the pier, there are two embayments on each side, suitable for either kiosks or wind shelters. The pier is built of composite piles of cast iron and steel, and lattice girders. A cast-iron hand-railing surrounds the pier, with seats at frequent intervals, lamp standards being placed at suitable intervals. The work has been carried out from the designs, and under the superintendence, of Mr. John J. Webster, M.Inst.C.E. The whole cost of the works was under 12,000l.

MEMORIAL WINDOW, ST. MARY'S, CHARD.—The fourth of a series of memorial windows at St. Mary's Church, Chard, has just been erected in the north aisle of that church. The subject of the window is that of the three Marys. Beneath the window, on a polished marble slab, is a brass tablet bearing an inscription. Both window and brass are from the studios of Messrs. F. Drake & Sons, of Exeter.

CAPITAL AND LABOUR.

OPERATIVE PAINTERS, NORTH STAFFORDSHIRE.—The operative painters of North Staffordshire having through their trades union sent to the Masters' Association a demand for a penny an hour advance and alteration in the working rules, Mr. T. Blashill, F.R.I.B.A., London, was appointed by the Board of Trade under clause 9 of the working rules to arbitrate upon the matter. He sat at the Grand Hotel, Hanley, recently, to take evidence, and was met by twelve members of the Conciliation Board—six masters and six operatives. The operatives' representative said they made their claim for an advance of wages on the ground that the painters were not adequately paid according to the wages paid in other branches of the building trades, and they were not getting a living wage. The loss of time in the winter months was another reason why they asked for an advance in wages. To this the employers stated that the wage paid to painters in this district was quite up to the average in other towns, and compared favourably with the wages paid to other branches of the building trades. The arbitrator asked for some comparison on this view of the question, and the following figures were supplied:

	Painters	Joiners	Brick-layers.	Plas-terers.
North Staffs...	7½	8½	8½	9
Bolton	8½	9	10	10
Manchester ...	8½	9½	10	10
Wolverhampton	7½	8½	8½	8½
Crewe	7	7	8	9

An operative stated that they had only received one advance in twenty years. The wages at the beginning of 1874 were 6d. per hour. An advance of 3d. per hour was given in April, 1874, making the wages 9d. per hour. This was taken off in 1880, and the wages were raised in 1894 to 7d. per hour. Wages were raised again in 1897 to 7½d. per hour, at which they remain at the present time. (This matter was arbitrated on last year in May, when the arbitrator decided that the wages should remain as at present, not less than 7½d. per hour.) An alteration of working rules was asked for as follows:—Rule 4.—The operatives asked for 6d. per day for expenses on all toiling off jobs on the ground of extra expense and loss of comfort when lodging away from home.—To this the employers plead that there is no precedence for such a course, it not being the custom in the building trades. Rule 5.—That paying on the job be discontinued, and wages paid at the shop, or time being allowed to be at the shop at pay time.—The employers said they would leave it entirely to the arbitrator, as this did not affect many wages,

generally being paid at the shop at 12 o'clock. A vote of thanks to Mr. Blashill closed the inquiry, after two hours' discussion.—*Staffordshire Sentinel.*

BUILDERS' LABOURERS' DISPUTE, LEICESTER.—The award of Sir William Markby in the dispute between the builders' labourers engaged in the new Wholesale Market and their employers has been published. The workmen originally "turned out" mix or lay concrete. But the arbitrator has adopted the view of the employers on the subject, and affirmed their right to employ navvies for this purpose if they choose.

DUNDEE QUARRYMEN'S STRIKE.—The strike of workmen at the quarries in the vicinity of Dundee recently acquired by a syndicate from the trust estate of Messrs. James Morrison & Son, has come to an end. At the Westhall and Duntrune quarries a section of the employees came out on strike against a reduction of 3d. per hour on the rate of wages. The men, or at least the majority of them, have returned to work on the employers' terms.

NORWICH CARPENTERS AND THEIR WAGES.—It will be remembered that on March 1 the carpenters and joiners of Norwich made a demand for an increased rate of wages, giving the three months' notice required by the rules. A conference between the employers and the men took place about three weeks ago, and it was carried on in a very amicable spirit on both sides. Correspondence followed on various matters, and terms were received from the masters. At a special meeting recently of the Amalgamated Carpenters and Joiners' Society it was decided to accept the employers' offer of 3d. an hour advance to begin on January 1 next; time and a quarter for overtime instead of the 3d. per hour previously paid; the settlement to stand for four years.—*Eastern Daily Press.*

FRENCH QUARRIES.—The officials of this quarry are now working as quarrymen, and several charges of molesting them were tried at Bangor Petty Sessions on the 4th, fines being inflicted. The quarry is to be opened to the men on the 11th, but it is not anticipated that many will resume work; it also seems impossible to give effectual police protection to men whose homes lie scattered over a wide mountain district.

LEGAL.

CASE UNDER THE LONDON BUILDING ACT.

DISTRICT SURVEYOR OF EAST HACKNEY (SOUTH) AND NORTH BOV v. GEO. S. SHAW.

This case was heard at the North London police-court, before Mr. Fordham, on the 24th ult. The District Surveyor explained that he found a stove fixed in this house in a dangerous way and served notice on the occupier to amend it. It was amended. He then applied to the occupier for a fee of 10s. for fixing a stove for trade purposes. Meanwhile the occupier left and could not be found. He then applied to the owner (the defendant). The defendant admitted he was the owner, but said that he knew nothing about the stove. The District Surveyor claimed under Section 154. The case was adjourned for seven days in order that the magistrate might consider it.

Mr. Fordham delivered judgment in the case on May 31. He said he felt it was a case that pressed rather hardy on the defendant, but he had examined the sections in the Act and cases bearing on the point, and come to a definite conclusion on the case. He recounted the facts as above stated, and that there was no builder in this case, but Section 5 (3) stated that where no builder is employed the owner becomes the builder. He therefore gave judgment that the fee of 10s. was due and 13s. costs.

The Surveyor remitted the 10s. awarded for his attendance under the circumstances, and 13s. was paid by the defendant.

ALLEGED INFRINGEMENT OF ANCIENT LIGHTS AT FOLKESTONE.

The case of White v. Flude came before Mr. Justice Buckley in the Chancery Division of the High Court of Justice on the 4th inst.

Mr. Henry Terrell, K.C., and Mr. Cave appeared as counsel for the plaintiff; and Mr. Astbury, K.C., and Mr. Watson for the defendant.

It appeared from the opening statement of Mr. Terrell that the action was brought by the plaintiff for an injunction to restrain the defendant from interfering with two ancient lights in the plaintiff's premises, No. 30, Victoria-road, Folkestone. There was no question raised as to the plaintiff's lights being ancient. That was not traversed. The plaintiff's title was also not traversed, and there was no question of acquiescence. The only question was, whether or not defendant's building interfered with the access of light to plaintiff's ancient lights. The defendant had put up a mission hall adjoining the plaintiff's house, and this was said to interfere with the access of light to the basement window, a kitchen window, and with the light of a little window in the outhouse or store shed, at the end of the yard opposite the plaintiff's premises. The plaintiff had enjoyed the light to these windows for upwards of twenty years, and

there was now in consequence of the defendant's building a very substantial diminution of light coming to both windows.

Mr. Andrew George Bromley, an architect and surveyor practising in Folkestone and Canterbury, and Mr. Howard Chatfield Clarke, an architect and surveyor, gave evidence to the effect that the defendant's building had materially affected the access of light to the windows in question.

In the result, his lordship, having heard the evidence of Mr. Ravenscroft Roger Smith, professor of architecture at King's College, and of Mr. Tilton, Tunbridge, a builder, to the effect that the mission hall did not interfere with the light coming to the plaintiff's two windows, characterised the action as a frivolous one, and dismissed it with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

2,177.—**A DEVICE FOR HEATING APPARATUS:** *J. F. Royle.*—The contrivance is intended for regulating the steam or hot-water supply of rooms that are warmed with steam or hot-water pipes and for similar apparatus. The force of expansion due to changes of temperature is utilised to work a valve that controls the flow of a fluid under pressure acting upon a piston or diaphragm which works the valve that regulates the supply; the thermostatic apparatus is available for regulating the temperature of water in a swimming-bath, for working boiler-dampers, or for ventilators. See also Specification No. 19,410, of 1893, for the expandible metal thermostat.

2,209.—**WINDOW-SASH FASTENINGS:** *R. Hine.*—A withdrawing spring is fitted upon a bolt in an arm pivoted to a bracket on the upper sash, a right-angled extension from the base of the bracket is affixed to the face of the meeting-rail, and a tongue projects from the lower side of a handle carried by the front end of the bolt. For fastening purposes one turns the arm downwards between two brackets on the lower sash so as to cause the tongue to engage with ratchet teeth on the faces of the brackets.

2,212.—**ELECTRICAL ARC AND INCANDESCENT ARC-LAMPS:** *W. Peritz.*—To prevent the electrodes from becoming consumed the inventor encloses them in a sealed glass globe that contains an inert gas or is exhausted as entirely as is possible. The electrodes may be movable or have a movable core for striking the arc. For incandescent arc-lamps he encloses the arc in a mantle composed of some refractory material such as rare earths mixed together, and insulates it from the electrodes with glass at some little distance from the arc.

2,220.—**APPLIANCES FOR EXCAVATORS, DREDGERS, &c.:** *E. McGregor.*—The carrying rope, which is passed over supports and is anchored at a distance, can be splined from its normal position with weights and other supports will avail to vary its normal position horizontally. The rope is passed through a cradle carried by a trolley to be traversed along rails upon the support by the turning of a screw. The remotest support may take the shape of a curved rail upon supports; arms and pulleys sustain the scoop, which is drawn along the carrying rope with a sling joined to the hauling rope. The scoop is a spring-catch to which the sling is secured in such a manner that as the hauling rope becomes abnormally strained when the scoop is deeply embedded the sling will fall into the position for release.

2,222.—**ELECTRICITY QUANTITY-METERS:** *A. Wright and Reason Manufacturing Company.*—A mercury voltmeter comprises a stoppered or entirely-sealed glass vessel, wherein is a mercury anode within a pocket at a level higher than that of a mercury cathode, into which platinum connecting wires are sealed, the vessel being filled with a suitable electrolyte—say, a solution of mercurous nitrate; as the mercury cathode increases in volume it flows over a ridge in regulated small quantities into a long vertical tube, which at the outset holds solution only, whereupon the position of the anode induces the dense solution upon its surface to flow down to the cathode; in order that the circulation may not be impeded by the reduction of the anode below the level of the lip upon the edge of its pocket, the vessel is provided with an auxiliary bulb in which an automatical supply of mercury keeps the anode surface at its proper level; the quantity of passing electricity is indicated by an adjacent scale which records the height of the mercury in the vertical tube. The instrument, which is used "shunting," can be reset by being turned over to the left hand and then replaced.

2,249.—**MACHINES FOR TENONING WOOD:** *T. N. Robins.*—A sliding table carries the piece of timber and when it has been fed forward between the rotary cutters a treadle is depressed for throwing the feed mechanism out of gear; brackets which slide upon the vertical face of the pedestal carry the rotary cutters; a hand-wheel that regulates the velocity-ratio of friction discs controls the speed of the feed, the feed being started by means of the pressure—by the treadle—of a friction disc against the friction-wheel; a strap wound around a drum pulls the table forward and weight pull the table backwards again at the liberation of the treadle.

2,364.—A FASTENING FOR DOOR-KNOBS: *M. Solomon*.—The two spindles are fashioned so that they can be screwed into the lock-follower upon different pitches to thread, for example, twelve, and twenty-four, to in., and are joined with a screw of eighteen threads to in.; thus either knob cannot be unscrewed when it is turned, since it becomes locked by the differential threads, but the knobs may be disconnected when they are being unscrewed at suitably relative speeds. The contrivance is described as being also adapted for other articles.

2,375.—A CONTRIVANCE FOR SLIDING WINDOWS: *S. Taylor*.—For a sliding window that can be swung out of its guides the lower sash is arranged to slide within an inner and higher frame, whilst the upper sash slides in an ordinary frame; a stop is fixed at one side of the upper part of the inner frame, and beneath that is hinged a deeper stop; frame-ribs engage with tongues upon the lower sash, their upper ends being cut away so that the lifted sash may be moved inwards and be then lowered and swung into the room when the deeper stop has been turned backwards; two pairs of weights on the inner and outer frames, respectively, balance the lower sash, and another pair on the outer frame balance the upper sash; the upper portion of the outer frame has guiding strips, and the lowered upper sash is guided with pins that run in grooves of which the horizontal parts will admit of the sash being turned downwards; a plate (which also serves as a lock) upon the outside of the lower sash to be forced against one of the frame-ribs with a pin fastened to the plate and passed through the sash to the inside, will prevent it from rattling.

2,420.—AN AUTOMATIC FLUSHING VALVE: *G. E. Ridgway*.—The valve, whilst more particularly devised for the discharge of effluent sewage from filter-beds, is adapted for other flushing purposes; a hinged flap-valve reposes against the inclined seat of the distributing channel, and the sewage will flow through holes in the valve and its seat, respectively, into a vessel mounted upon the valve as soon as the liquid has risen to a certain level. When the vessel is filled it tilts so as to overbalance and open the valve; an outlet or valve of the vessel provides for the escape of the imprisoned fluid. In another form a pipe from the side of the distributing channel conveys the fluid into the containing vessel, which is mounted upon a bracket attached to the valve, and is provided with a siphon or other suitable outlet for determining the times of discharge.

2,450.—AN APPLIANCE FOR USE WITH THE ALARMS OF GAS, WATER, OR ELECTRICITY SUPPLY SYSTEMS: *G. T. Weldon*.—For the turning-on of the supply at any pre-determined time a weight dial hangs upon the winding level of the alarm mechanism is joined with a cord to the tap-cock or electrical switch, and will fall when the alarm has been sounded; the movement of the lever is limited with stop-pins.

2,451.—LIFTING JACKS: *C. Portway and J. T. Graham*.—In order that the operation of the lifting lever shall lower the load step by step, the inventors have devised a two-pronged pivoted lever in such a manner that projecting side-springs engage with the mechanism in front and under surfaces of two clutches as soon as the handle is forced downwards; thereupon the action of the clutches becomes reversed—the one locks the stem, whilst the other becomes disengaged as it moves upwards. The invention embodies an improvement of that described under No. 7,190 of 1880.

2,473.—ELECTRICAL ARC-LAMPS: *E. C. Maray*.—The arc is formed at the free ends of the carbon rod and a surrounding hard carbon helix. If a globe is employed for enclosing the arc and carbons, the latter should be made as incandescent lamp filaments.

2,524.—LIFT-VALVES: *H. Adams*.—For a stop-cock adapted for domestic water supply the inventor fashions the casing with its lower portion enlarged in order to constitute the seating of a ball-valve. Through the top of the casing he inserts a spindle, upon the end of which the ball is screwed. Stops upon the spindle restrict the movement of the valve, which may be seated in the lower extended portion of the casing.

2,534.—AN APPLIANCE FOR USE WITH STEAM PILE-DRIVERS: *H. H. Cochrane and A. H. Cochrane*.—For pile-drivers wherein the cylinder, sliding upon the piston-rod, serves for the monkey the inventors provide upon the piston an upper tubular piston-rod that projects through the upper end of the cylinder, together with a lower solid piston-rod projecting through the lower end of the cylinder so as to rest upon the pile. A plate retains in its place a lug from the cylinder, that moves between two vertical balks, and a tubular valve joins the steam-pipe to the piston-rod. In the sliding part of the valve are two cylinders having different diameters and separated by an annular passage. The diameters are arranged so that the pressure of steam shall maintain the valves as "cut off," and steam from above the piston shall be exhausted through openings, the tubular piston-rod, and the tubular valve. Upon the depression of the valve by the action of a pivoted lever, the steam will flow from a pipe through the openings and the tubular piston-rod into the cylinder.

2,535.—STONE-SAVING MACHINERY: *G. F. Filton*.—Channel-iron is used for the construction of the swinging frame at its ends and sides with distance

corner-pieces, and for the movable heads on to which the ends are secured, the heads being fastened to the ends with double T-headed bolts that are passed between the channels and then turned. For a heavier frame a built-up box section is contrived and a guideway for the movable heads is provided in the shape of angle-irons affixed to it; the swinging water-supply pipes are counter-balanced with weights over their axes, and are fashioned in L instead of J shape. Arrangements for ensuring either a slow or a quick feed or return are made by means of spur-wheel gearing in each instance, upon a pivoted lever.

2,621.—AN INDICATOR FOR USE IN ELECTRICAL LIGHTING: *A. Rührstrat and E. Rührstrat*.—The inventors seek to indicate the occurrence of short circuit in a lighting circuit. In one form they put a lamp in shunt with the main fuse; when the fuse blows at the lighting of the lamp a short circuit is announced, the other lamps becoming dim or extinguished; a fuse may be employed as a protector of the lamp.

2,644.—FLAP AND SLUICE VALVES: *S. H. Adams*.—In order that the valve, which is hinged on to the framework, may be operated apart from the action of the fluid that flows through it, the inventor joins a crosshead to the flap with ears, and provides a screw, or other suitable mechanism, for the lifting or lowering of the crosshead; the valve may be maintained in its closed position by means of the engagement of the extended ends of the crosshead with catches set upon the framework.

2,675.—AIR-HEATING STOVES: *C. Fänger*.—The whole of the stove—the fireplace excepted—is built up with chamotte bricks, and with Dutch tiles for the external facing. Two partitions divide it into three compartments; a plate normally closes the shoot down which the fuel is shot from a fixed scuttle. The flames and products of combustion pass through horizontal passages and apertures into a narrow channel and thence through angle-wise tubes into the escape-pipe. Adjustable openings admit air into the lower part of the stove; a channel and openings conduct it to a space around a coil of tubes, whence, after having been warmed, the air escapes through a pierced plate; fresh air from the lower portion of the stove enters through two pipes, and the draught through the pipes can be regulated by a suitable adjustment.

MEETINGS.

SATURDAY, JUNE 8.

British Institute of Certified Carpenters.—Visit to *Kew Gardens*. 4 p.m.
Northern Architectural Association.—Visit to *Hexham*.

MONDAY, JUNE 10.

Circle of Works Association (Carpenters Hall).—Monthly meeting. 7.30 p.m.

WEDNESDAY, JUNE 12.

Institute of Sanitary Engineers (Incorporated) (19, *Bloomsbury-square, W.C.*). General Purposes and Finance Committee at 4 p.m. Half-yearly general meeting at 7 p.m.

THURSDAY, JUNE 13.

Society for the Encouragement of the Fine Arts.—Dr. *Phené, V.P.*, F.S.A., on "Our Highly Refined Forerunners in Pre-Roman Britain." 8 p.m.

FRIDAY, JUNE 14.

Edinburgh Architectural Association.—Annual excursion, to *Hexham and Durham*.

SATURDAY, JUNE 15.

Edinburgh Architectural Association.—Annual excursion (concluded).

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

May 12.—By <i>Moses Smith & Sons</i> (at <i>Wrington</i>), <i>Wrington, Somerset</i> .— <i>Redhill Farm</i> , 22 a. 2 r. 32 p., f.	£1,000
Wington Hill Farm, 13 a. 1 r. 35 p., f.	1,075
Tutton's Piece, 3 a. 0 r. 9 p., f.	120
May 13.—By <i>T. J. Barnett & Son</i> (at <i>Birmingham</i>).— <i>Harborne, Staffs.</i> — <i>The Home Farm</i> , 9 a. 1 r. 15 p., f.	5,000
<i>Northfield, Worcester</i> .— <i>Bartley Green Estate</i> , 47 a. 1 r. 29 p., f.	2,200
By <i>Moses Smith & Sons</i> (at <i>Bristol</i>).— <i>Westerleigh, Glos.</i> — <i>Weston's Farm</i> , 13 a. 3 r. 17 p., f.	850
Various enclosures, 27 a. 3 r. 13 p., f.	1,292
<i>Frenchay, Glos.</i> — <i>Goreham Mead</i> , 11 a. 2 r. 23 p., f.	1,275
<i>Goreham Hill enclosure</i> , 4 a. 0 r. 18 p., f.	202
<i>Hampton, Glos.</i> — <i>Residents and 7 a.</i> , 3 r. 34 p., f.	1,550
Various enclosures, 127 a. 1 r. 19 p., f.	6,925
A Pennant stone quarry and 3 a., f.	240
By <i>Edwin Evans</i> (at <i>Clapham Junction</i>).— <i>Fulham</i> .—40, <i>Amelsand-rd.</i> , ul. 72 1/2 yds., g.t. 26. 10s.	300
<i>Battersea</i> .—22, <i>Kersley-rd.</i> , ul. 72 1/2 yds., g.t. 23 1/2, g.t. 45s.	340
11 and 13, <i>Lavender-rd.</i> , ul. 25 yds., g.t. 3l.	460
<i>Windsor</i> .—449 and 441, <i>York-rd.</i> , ul. 81 yds., g.t. 17s.	355
8 to 12, <i>Summerley-st.</i> , ul. 79 1/2 yds., g.t. 50s.	800
<i>Balham</i> .—34 to 40 (even), <i>Cathles-rd.</i> , ul. 90 yds., g.t. 27s. 10s. 3/4d.	1,240
<i>Totting</i> .—22 and 24, <i>Graveney-rd.</i> , ul. 77 yds., g.t. 10l.	358
May 24.—By <i>Stafford & Rogers</i> (at <i>Bedford</i>).— <i>Goldington, Beds.</i> — <i>The Cottage and 1 a.</i> , 3 f. 1 p., f.	600

Two enclosures, 4 a. 2 r. 17 p., f.	£270
Enclosures of garden land, 54 a. 3 r. 39 p., f.	4,300
<i>Wall Close</i> , 14 a. 1 r. 8 p., f.	900
Twelve cottages and 2 a. 2 r. 20 p., f.	1,970
Enclosures of land, 1 a. 1 r. 7 p., f.	215
Inappropriate the rent-charges of 36 1/2 12s.	5,800
By <i>Clements, Son, & Hughes</i> (at <i>Coventry</i>).— <i>Stoneleigh, Warwick</i> .— <i>Residence and 1 a.</i> , 1 r. 25 p., f.	560
By <i>Linnett & Lane</i> .— <i>Marlesden</i> .—24, <i>Greenhill-park</i> , f., g.t. 60s.	925
8, <i>Baker-rd.</i> , ul. 81 yds., g.t. 74s. 10s., g.t. 40s.	230
<i>Walsgrave, Middlesex</i> .— <i>Palmerston-rd.</i> , a block of land, f.	350
By <i>A. J. Sheffield</i> .— <i>Poplar</i> .—33 and 35, <i>Augusta-st.</i> , ul. 47 yds., g.t. 6l.	235
By <i>F. & W. Stocker</i> .— <i>Lee</i> .—26, <i>Turner-rd.</i> , f.	430
By <i>W. N. Willoughby</i> .— <i>Norwood</i> .—9, <i>Chestnut-rd.</i> , ul. 82 yds., g.t. 8s.	550
<i>Herne Hill</i> .—171 and 173, <i>Norwood-rd.</i> , ul. 70 yds., g.t. 12s. 18s., g.t. 64s.	720
May 25.—By <i>Sampor & Godwin</i> (at <i>Blandford</i>).— <i>Charlton Marshall, Dorset</i> .—Enclosures of down land, &c., 203 a. 3 r. 33 p., f.	500
Four cottages and 5 a. 1 r. 0 p., f.	244
Various enclosures, 22 a. 3 r. 21 p., f.	1,260
May 29.—By <i>Matthews, Matthews, & Goodman</i> .— <i>North Cheam, Surrey</i> .— <i>London-rd.</i> , <i>The Laurels</i> and nearly a f., f.	950
<i>Staines, Middlesex</i> .— <i>Leacroft-rd.</i> , <i>Craigmar</i> , f., f. 43d.	655
By <i>Rogers Bros</i> .— <i>Forest Hill</i> .—13, 15, and 17, <i>Dalmain-rd.</i> , ul. 60 yds., g.t. 12s.	450
82, <i>Ewart-rd.</i> , ul. 75 yds., g.t. 4l. 10s.	170
<i>Old Kent-rd.</i> .—25 to 43 (odd), <i>Copner's rd.</i> , ul. 32 yds., g.t. 40s.	1,979
<i>Dulwich</i> .—26 and 38, <i>East Dulwich G. ave.</i> , ul. 71 yds., g.t. 14s. 7d.	765
<i>Peckham</i> .—123 and 125, <i>Albert-rd.</i> , ul. 64 yds., g.t. 10l.	523
100 to 202 (even), <i>Albert-rd.</i> , ul. 53 yds., g.t. 57s. 18s. to 188 (even), 202 and 204, <i>Albert-rd.</i> , ul. 1 g.t. 12l. 6s. ul. 55 yds., g.t. 40s.	1,400
By <i>Waxstap & Sons</i> .— <i>Holloway</i> .—108, <i>Lady Margaret-rd.</i> , ul. 67 yds., g.t. 6l. 15s., g.t. 50s.	580
By <i>Willis & Crouch</i> .— <i>Acton</i> .— <i>High-st.</i> , 1 g.t. 45s., ul. 55 yds., g.t. 20s.	310
<i>Norwood</i> .— <i>Auckland-rd.</i> , <i>Stamington-rd.</i> , ul. 82 yds., g.t. 10l. 8s.	465
By <i>Wyatt & Son</i> (at <i>Chichester</i>).— <i>Stockbridge, Sussex</i> .—A freehold cottage.	270
Six plots of land, f.	315
<i>Westergate, Sussex</i> .— <i>Cophthold enclosures</i> , 13 a. 3 r. 8 p.	400
By <i>Peirce & Thorne</i> (at <i>Northampton</i>).— <i>Tilfild, Northants</i> .—A freehold farm, 77 a. 1 r. 23 p., f.	2,050
<i>Pottishall, Northants</i> .— <i>Phipps Barn Farm</i> , 42 a. 2 r. 39 p., f.	825
<i>Stonetip Leys, Sign Hill</i> , and Allotment closes, 47 a. 1 r. 7 p., f.	1,072
A freehold farm, 57 a. 3 r. 22 p.	1,125
<i>Descote, Northants</i> .—Two enclosures, 27 a. 1 r. 22 p., f.	600
<i>Kastrole, Northants</i> .—Two enclosures, 8 a. 3 r. 33 p., f.	460
<i>Homestead and 7 a.</i> , 1 r. 25 p., f.	530
<i>Elm Tree Close</i> , 3 a. 2 r. 37 p., f.	220
By <i>Boyton, Program, & Beckmaster</i> (at <i>Waltham Green</i>).— <i>Shepherd's Bush</i> .—8, <i>Thornfield-rd.</i> , ul. 76 1/2 yds., g.t. 7s. 2d.	270
<i>Fulham</i> .—22, <i>Epirus-rd.</i> , ul. 80 yds., g.t. 74s. 7s.	240
12, <i>Waltham-av.</i> , ul. 78 yds., g.t. 6l.	100
By <i>Thornborough & Co.</i> (at <i>Penrith</i>).— <i>Penrith, Cumberland</i> .—Enclosures of land, 43 a. 2 r. 35 p., f.	2,150
<i>Newton Reigny, Cumberland</i> .—Enclosures of land, 13 a. 2 r. 33 p., f.	350
By <i>C. R. Morris, Sons, & PEARO</i> (at <i>Bridport</i>).— <i>Powerstock, Dorset</i> .— <i>Nappercombe Farm</i> , 308 a. 3 r. 25 p., f.	7,200
By <i>Biowell & Sons</i> (at <i>Cambridge</i>).— <i>Cambridge</i> .—11, <i>Penshill</i> , area 1,660 ft., f., 80s. 1/2, 2, and 3, <i>Wheeler-st.</i> , area 1,214 ft., f., 1 r. 102d. 10s.	2,650
2 and 3, <i>Parson's-court</i> , area 1,506 ft., f., 1 r. 50d.	1,300
By <i>Albert Bull</i> (at <i>Ventnor</i>).— <i>Godshill, Isle of Wight</i> .— <i>French Mill</i> and 9 a. 2 r. 24 p., f.	750
<i>Fairfield's Estate</i> , 68 a. 1 r. 27 p., f.	3,000
<i>Whitwell, Isle of Wight</i> .— <i>Southford Mills</i> , f., f. 40d.	700
<i>Niton, Isle of Wight</i> .—1 and 2, <i>Shipton Villas</i> , f.	290
<i>Ventnor, Isle of Wight</i> .— <i>High-st.</i> , <i>Havelock Villa</i> , f., f. 40d.	615
<i>St. Boniface-rd.</i> , <i>Clovelly</i> , ul.	540
<i>Belle Vue-rd.</i> , <i>Castle View</i> , f.	540
May 30.—By <i>John Davies</i> .— <i>Tottenham</i> .—2, <i>Braemar-rd.</i> and 30, <i>Cluvel-rd.</i> , f. <i>Kensington</i> .—50, <i>Abingdon-rd.</i> , ul. 58 yds., g.t. 5l. 10s. 7d. 4s.	810
<i>Norwood</i> .—50, <i>Palace-rd.</i> , f., f. 32d.	400
By <i>Messrs. KERSWELL</i> .— <i>Rainham, Essex</i> .— <i>Uppington</i> , a block of building land, 9 a. 1 r. 4 p., f.	2,560
<i>Wandswoth</i> .— <i>Park-rd.</i> , f.g.t.'s 144, reversion in 78 yds.	360
<i>Horsely Rise</i> .— <i>Lambton-rd.</i> , f.g.t.'s 180 12s., reversion in 77 yds.	480
By <i>Wm. Stevens</i> .— <i>Walthamstow</i> .—1 to 23 (odd), <i>Park-rd.</i> , ul. 87 yds., g.t. 18l.	1,295
<i>Stoke Newington</i> .—19, <i>Victoria-gt.</i> , ul. 94 yds., g.t. 5l. 5s.	230
By <i>R. J. Suter</i> .— <i>Walthamstow</i> .—4 and 11, <i>Nicholson-rd.</i> , f.	735
By <i>J. A. Trythall</i> .— <i>Croydon</i> .—9, <i>Tanworth-rd.</i> , ul. 49 1/2 yds., g.t. 6l., 1 r. 20d.	300
By <i>Newson, Edwards, & Shephard</i> .— <i>Holloway</i> .—55, <i>Parkhurst-rd.</i> , ul. 23 yds., g.t. 7l. 10s., g.t. 55s.	470

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Table with 4 columns: Nature of Work, By whom Advertised, Premiums, and Designs to be delivered. Includes entry for 'Laying out Winter Garden' by Penzance Corporation.

CONTRACTS.

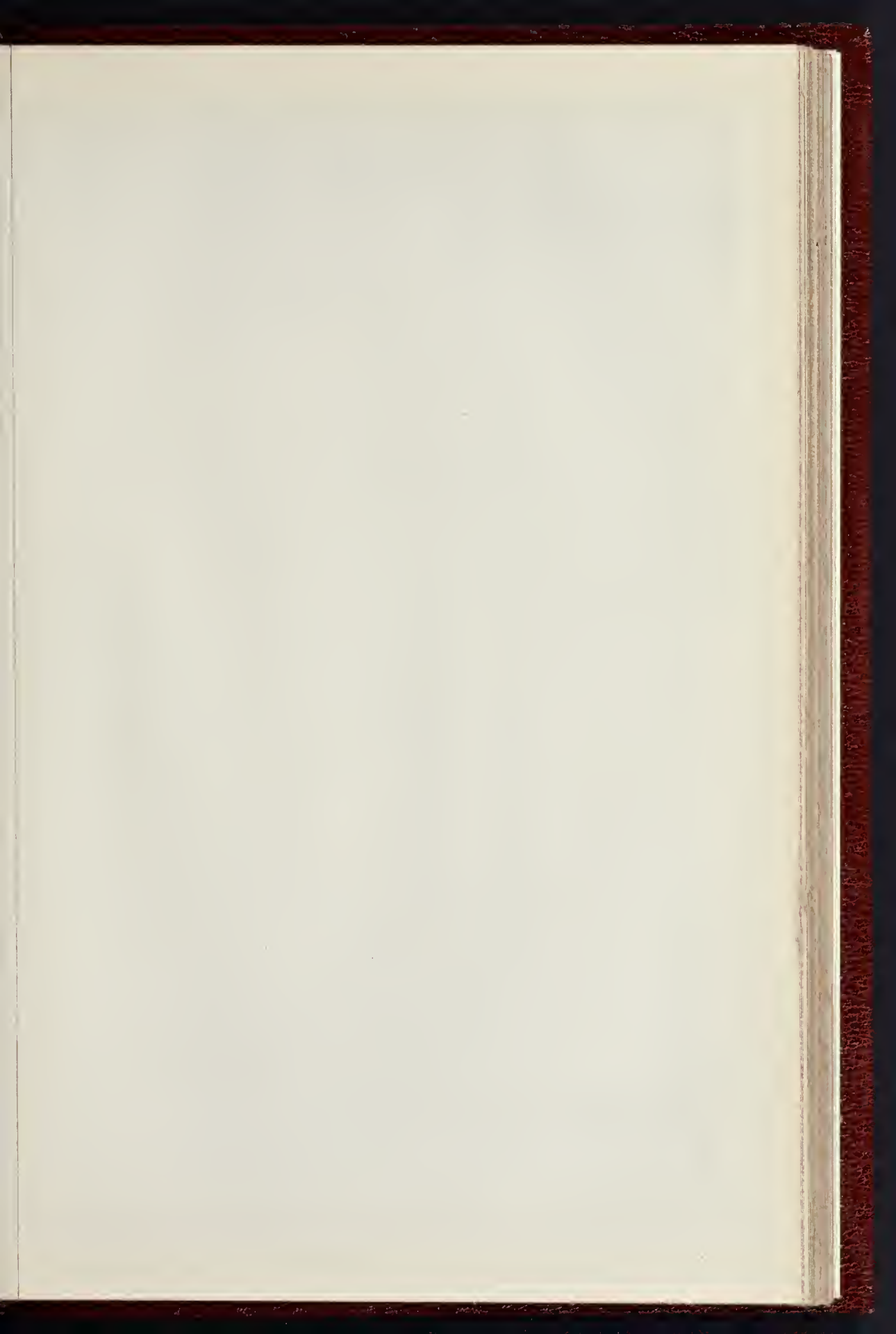
Table with 4 columns: Nature of Work or Materials, By whom Required, Forms of Tender, &c., Supplied by, and Tenders to be delivered. Lists various construction projects like 'Electrical Plant', 'Hospitals', and 'School Buildings'.

PUBLIC APPOINTMENTS.

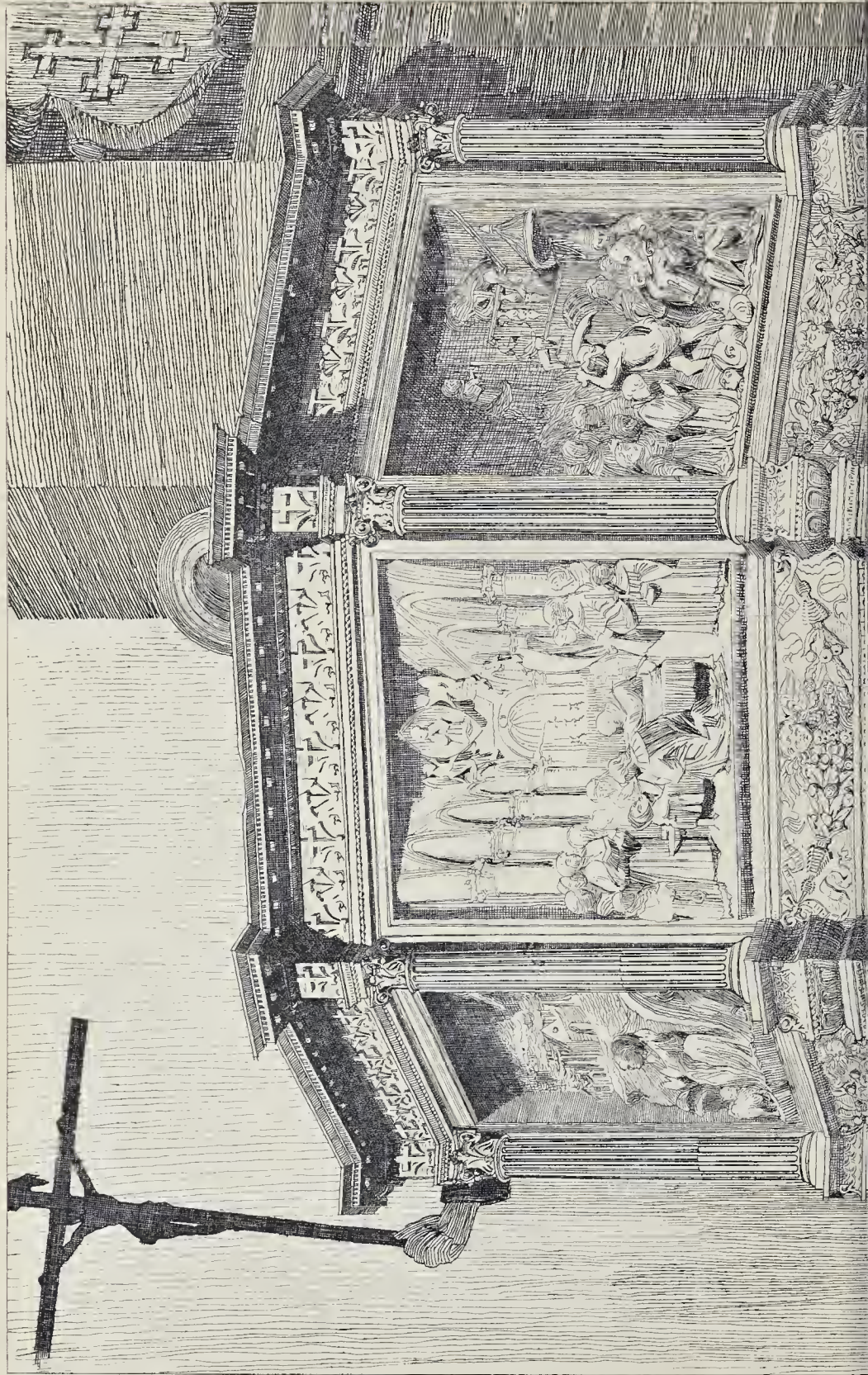
Table with 4 columns: Nature of Appointment, By whom Advertised, Salary, and Application to be in. Lists positions like 'Road Foreman', 'Assistant', and 'Chief Assistant'.

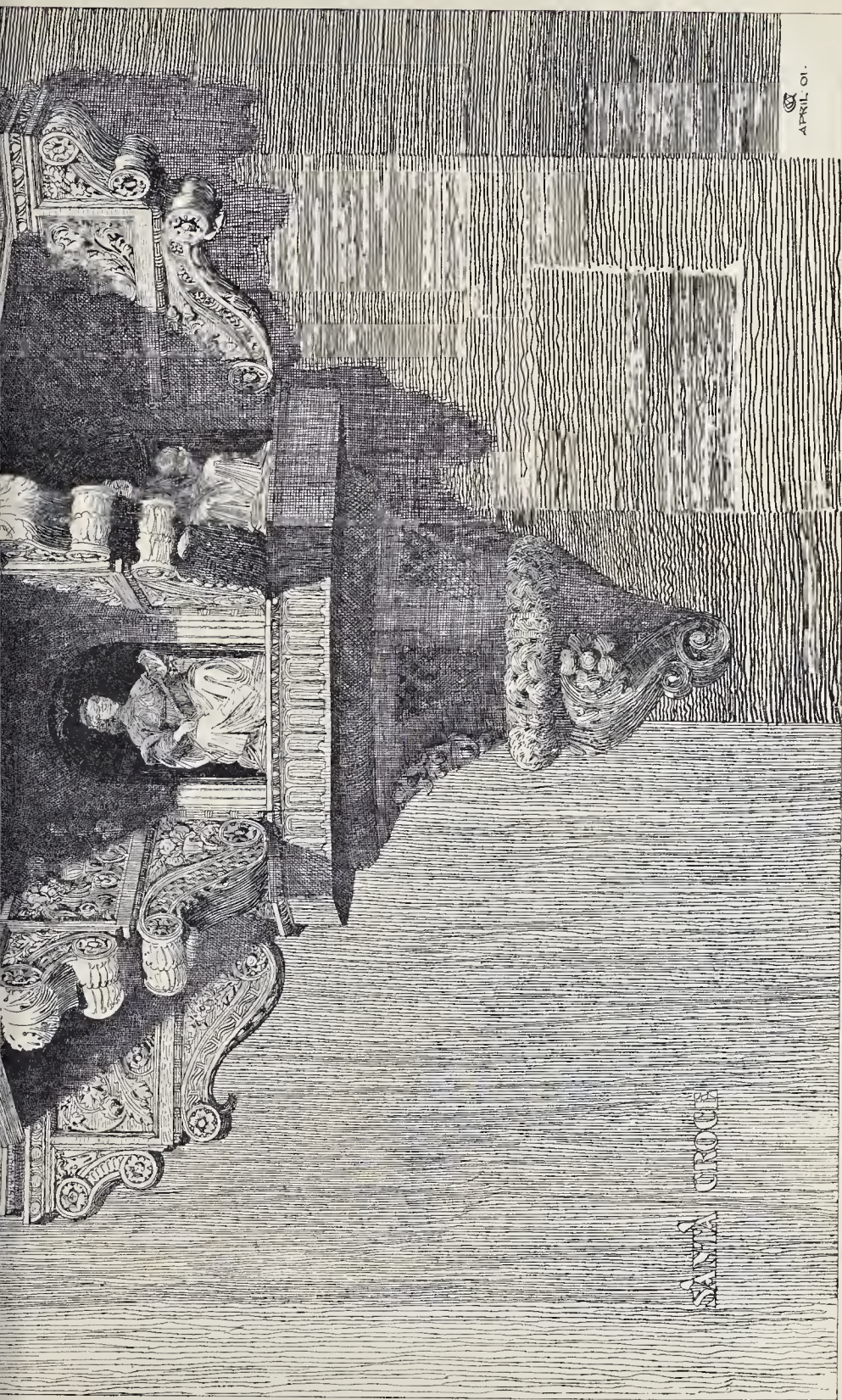
Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.

Table with 4 columns: Location, Area/Details, Price, and Remarks. Lists various plots for sale or lease, such as 'Dalston', 'Leyton', and 'Leigh'.



THE BUILDER, JUNE 8, 1901



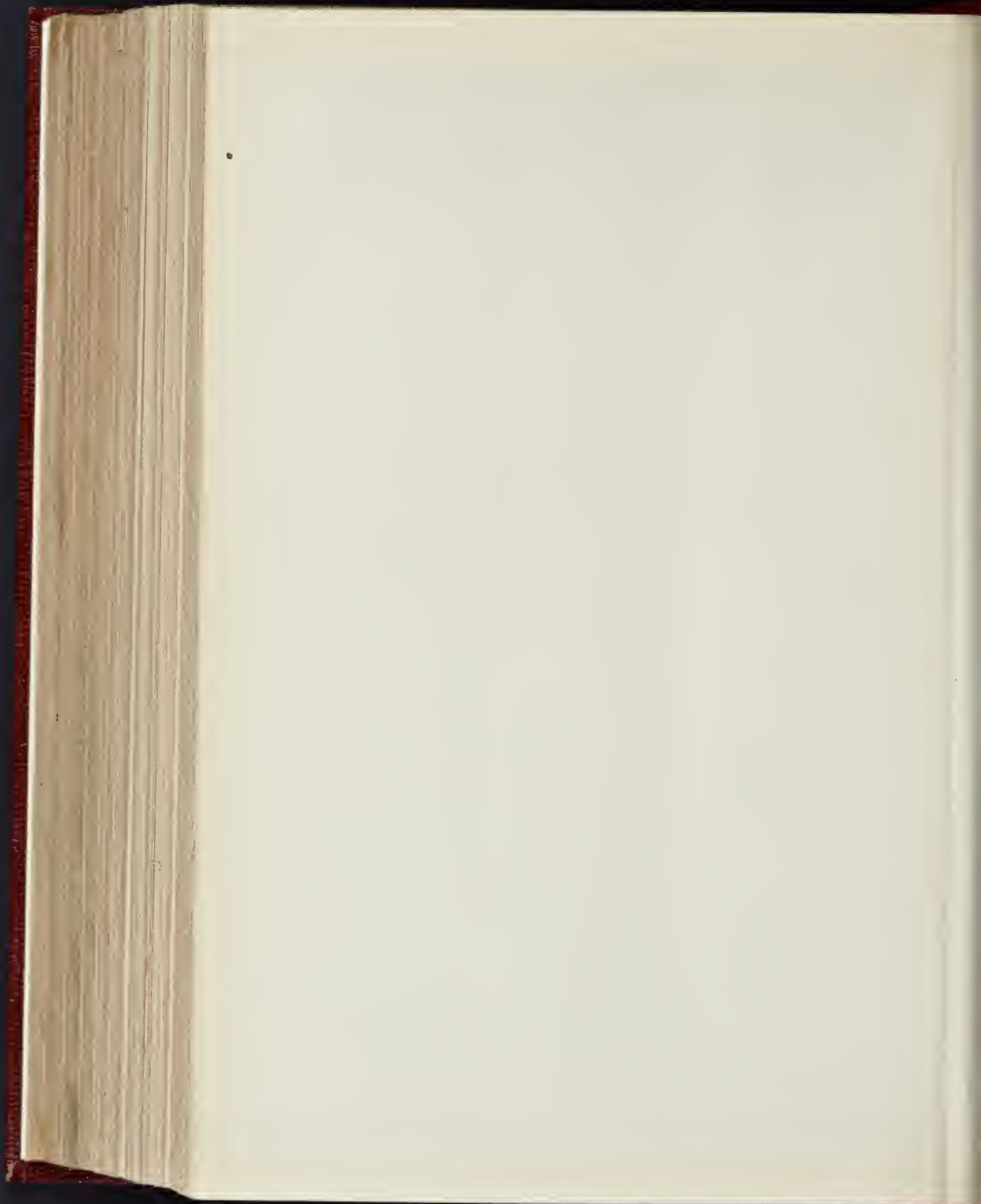


SANTA CROCE

PULPIT, SANTA CROCE, FLORENCE.—FROM A DRAWING BY MR. W. CURTIS GREEN

PHOTOLITHO SPRAGUE & CO. LITH. 445 EAST MADISON STREET, CHICAGO, ILL. U.S.A.

APRIL 01.



PRICES CURRENT OF MATERIALS.

* * * Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

Table listing various materials like Hard Stocks, Rough Stocks, Facing Stocks, Shippers, etc., with prices in £ s. d. and quantities.

NOTE.—The cement and lime is exclusive of the ordinary charge sacks.

STONE.

Table listing stone materials like Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, etc., with prices.

SLATES.

Table listing slate materials like 20x10 best blue Bangor, 11 5 0 per 1000 of 1200 at ry. dep., etc.

TILES.

Table listing tile materials like Best plain red roofing tiles, Hip and valley tiles, etc.

WOOD.

Table listing wood materials like Deals: best 3 in. by 11 in. and 4 in., Hip tiles, etc.

PRICES CURRENT (Continued).

WOOD. At per load of 50 ft. £ s. d. £ s. d.

Large table listing various wood materials like Fir timber, Second yellow deals, White Sea: First yellow deals, etc., with prices.

METALS.

Table listing metal materials like IRON—Common Bars, Staffordshire Crown Bars, etc., with prices.

PRICES CURRENT (Continued).

METALS. Per ton, in London. £ s. d. £ s. d.

Table listing metal materials like LEAD—Sheet, English, 3 lbs. & up., Pipe in coils, etc.

ENGLISH SHEET GLASS IN CRATES.

Table listing glass materials like 15 oz. thirds, fourths, etc., with prices.

OILS, &c.

Table listing oil materials like Raw Linseed Oil in pipes, in barrels, etc.

VARNISHES, &c.

Table listing varnish materials like Fine Elastic Copal Varnish for outside work, etc.

TO CORRESPONDENTS.

The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications...

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday, N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £50, unless in some exceptional cases and for special reasons.]

Table listing tender notices for Bolney (Sussex), Bracknell, and Brighton, with names of architects and dates.

[See also next page.]

LONDON.—For electricity and destructor station for the Borough of Woolwich.—

Table with columns: Foundations, Station, Total, Extra if Portland stone, Saving if Terra-cotta. Lists contractors like E. Proctor, D. Gibb & Co., Martin, Wells, & Co., etc.

BRIGHTON.—For alterations and additions at No. 43, Dyke-road, for Messrs. Beckwith. Mr. W. C. F. Gillam, architect, Brighton:—

EASTBOURNE.—For the Sanatorium extension, for the Borough of Eastbourne. Mr. Wm. Chapman Field, Borough Architect, Eastbourne:—

Table with columns: Original Estimate, Deductions, Amended Total. Lists contractors like Gregar & Co., Johnson & Co., J. C. Lacey, etc.

EASTBOURNE.—For alterations to Town Hall, Eastbourne. Mr. W. Chapman Field, Borough Architect:—

LONDON.—For the erection of shops and offices, Middlesex-street, E.C. Messrs. Dale & Gadsdon, architects, 8, Union-court, Old Broad-street, E.C.:

SANDGATE (Kent).—For the erection of stores, cartshed, and entrance gates, for the Urban District Council. Mr. A. Robert Bowles, Surveyor to the Council. Quantities by Mr. Alfred R. Evans, 8, St. Martin's-place, W.C.:

STEYNING.—For the erection of a pair of villas, for Mr. W. P. Breach. Mr. F. Slaughter, architect, Steyning and Shoreham. Quantities by architect:—

C. B. N. SNEWIN & SONS, Ltd. MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, 30, & 31, RAY STREET, FARRINODON ROAD, E.C.

WALTHAMSTOW.—For erection of shops and office premises, Wood-street, Walthamstow, for the Charity Trustees. Mr. W. A. Longmore, architect, Bridge-chambers, Walthamstow:—

Table with columns: Contractor, Amount. Lists contractors like J. Holliday, West Bros. & Pettit, S. J. Scott, etc.

WEST BRIDGFORD (Notts).—For additions to church, Lady Bay. Mr. William R. Gleave, architect, 18, Low Pavement, Nottingham. Quantities by architect:—

WEST BRIDGFORD (Notts).—For pair of houses, Millicent-road. Mr. William R. Gleave, architect, 18, Low Pavement, Nottingham. Quantities by architect:—

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The Modern Walls of Jerusalem.

AFTER the disappearance of the Latin feudal kingdom of Jerusalem at the close of the thirteenth century, and the extension of the Egyptian Mohammedan government in the Levant, the famous city seems to have sunk into a very unimportant condition; no monuments of any size or architectural character can be attributed to the fourteenth and fifteenth centuries. The Christians must have been content with such ruins as they were permitted to occupy, and the Egyptians have left very few traces of their presence in the Holy City. This may partly be accounted for by the fact that during these centuries the capital of the district was once more constituted at Ramleh, on the great caravan route by Gaza, where, in the days before the Crusades, the Ommayyeds had founded their centre of government. At the beginning of the sixteenth century Ramleh was falling into the decay in which we now see it, and Jerusalem was restored as a walled city, after two centuries of ruin. The "Aksa" or principal sanctuary of the "Haram" enclosure (this enclosure, occupying the ancient acropolis of the city, is usually known as the "Mosque of Omar") is probably the only monument of any size erected by the Egyptian Government. According to an inscription it seems to have been built, or rebuilt, by the Mamluke Sultan Mohammed *ibn Kalanin* in 1327. It is merely a very poor attempt to copy a Christian church; the materials are all second-hand, and the mode of construction and the few attempts at ornament are probably amongst the poorest and meanest examples of the Mohammedan style. At the north end is an arcaded porch recalling the design of a common Cairene type of mosque of the period. As an example of

Saracenic architecture it is beneath criticism. One or two small monuments scattered about the Haram without order or arrangement also date from this time.

With the beginning of the sixteenth century came a very great change in the condition of Jerusalem. The Osmanli Turks, in the extension of their immense empire, took possession of Palestine, and one of the most important monuments of the reign of the first two Turkish rulers of Palestine is the singular, and in some respects magnificent, wall erected round Jerusalem (see lithographed plan in this issue). This imposing work evidently dates from the commencement of their rule in 1517, as the inscriptions on the north side of the city record the name of Selim I. Suleiman II, his successor, is perhaps to be credited with the greater portion of the work and its completion. The dates on mural tablets inserted in various portions of the wall range over a period of about twenty-five years. At this time the Ottoman Empire was attaining its most splendid development, and the retreat of the Knights of St. John from Rhodes in 1522 marks perhaps its greatest victory over the Western nations. Fifty years later the battle of Lepanto put an end to all Turkish advance westward, and heralded the decay which is associated with the Turkish name at the present day.

The innumerable voyages, travels, and histories written by pilgrims of the sixteenth century on their return from their perilous journey to the Holy Sepulchre naturally contain many references to this then new wall. These worm-eaten volumes may be found on the dusty shelves of all the older European libraries, and a few extracts from them will suffice to give some idea of the Holy City in those days.

Ludovico degli'Agostini, of Pesaro, wrote an account of his pilgrimage about 1550 for the Duke of Urbino. He describes the new wall of Jerusalem as the finest to be seen in the whole world. It was built of fine white stone properly squared, and decorated with merlins and many turrets, &c. As in many Turkish cities, there was also a fine castle

which reminded him of that at Ferrara. The wall was built by Sultan Suleiman, in accordance with his father Selim's intention, as an *ex voto* to the holy Mohammedan city. Selim, in his victorious progress through Syria on the way to Egypt, had camped outside near the gate of St. Stephen or Bab Sitti Mariam, and here he meditated the complete destruction of Jerusalem. But his intentions were changed in consequence of a dream in which he seemed to see the Holy City being devoured by two lions. Instead of destroying it he determined on surrounding the holy places with the present magnificent wall; but he seems to have desired it should not be prepared for artillery. Before leaving Jerusalem he presented rich gifts to the inhabitants, including the Christian communities. The story of the vision of two lions is supposed to be commemorated in the two very conventional attempts to represent such animals which may be seen over the arch of the Bab Sitti Mariam. The Sultan's decision not to regularly fortify the town originated in the policy of previous Mohammedan rulers, who, for fear of having a strong fortress within their borders, which the Christians would desire to secure, had always destroyed the mediæval walls whenever they became masters of the city.

In the middle of the sixteenth century Jerusalem was supposed to contain 15,000 inhabitants within the new wall, which was about three Italian miles in circuit. The guard, called "Tambraçanò" was changed every six hours to the sound of drums and fifes, and this served for a sort of clock in addition to the call of the muezzin from the minarets, bells being, of course, out of use.

The Seigneur de Villamont, who visited Jerusalem in the latter half of the sixteenth century, was surprised to find the city gates without any *pont-levis* or outworks. At the entry of the château were a number of cannon, some in bronze, others in iron, "qui sont braquées pour la défense de la porte." The château was of great extent, similar to those in Italy, but "sans aucunes tours, fors une bien haut élevée, et en forme

de donjon, qui sert pour faire la sentinelle." Evidently this château, or "Castrum Pisanum," as it was known all through the Middle Ages, has been added to since the sixteenth century, for at the present day there are two or three very distinct towers in its construction.

Quaresimus, "Guardian of Mount Sion," at the beginning of the seventeenth century, hardly mentions the city wall in his voluminous "Elucidatio Terræ Sanctæ." He merely states its having been built by Suleiman, and the legend that the architect had his head cut off at the conclusion of the work (a convenient mode of settling his commission), because he had excluded the portion of Zion on which the Cenaculum stood. Quaresimus also gives the Hegira dates, which were inserted at different points on the wall in small stone tablets, as follows:—

St. Stephen's Gate (A.D. 1516) . . . A.H. 921
Gate of Flowers . . (A.D. 1539) . . . A.H. 944
Damascus Gate . . (A.D. 1539) . . . A.H. 944
Sion and Dung

Gates (A.D. 1542) . . . A.H. 947

The materials were partly quarried for the purpose, but Christian buildings furnished the greater part. The Minorites were expelled from the Mount Sion Convent in 1549 (*Gesta Dei per fratres Minores*), but they only occupied the modern convent of S. Salvator in 1559.

Francis I., King of France, seems to have exerted himself on behalf of the dispossessed Minorites, and an interesting brief on the subject addressed to him by the Sultan Suleiman has been published in various books on this chapter of history. The Jews were accused of intriguing with the Mohammedans to turn the Franciscans out of the Cenaculum, who, after their expulsion, were condemned to remain outside the city for years, exposed to the attacks of Arab marauders.

The voyage of the French Ambassador, M. d'Aramon in 1547 contains some references to Jerusalem. His arrival outside the walls of the city is described, and the way in which he was met by all the notables, escorted by a large body of arquebusiers. The city is described as having been enclosed with walls by the Turks, but its aspect seems to have been disappointing. The streets being uninviting and apparently in ruins, the arcades, which had anciently covered them and permitted of one's passing about the city dryshod in wet weather, had fallen down. The market was near the *Porta Speciosa*. M. d'Aramon seems to have been chiefly impressed by the ruinous condition of the interior of the city.

An old semi-devotional description of the Holy City at this period was written by Fra Bonifazio Corsetti in 1553. It is called "*Liber de perenni cultu Terræ Sanctæ*," and contains some curious particulars. From this it would appear that the ancient wood doors of the Golden Gate were removed at the time of rebuilding the walls, and they were presented to the Franciscans as a relic, and placed in the collection of relics preserved in the Church of the Holy Sepulchre. About this time the annual commemoration of Christ's supposed entrance by the Golden Gate, which was celebrated by a procession of the Franciscan monks from *Eetaphage* to the Cenaculum through the valley of *Jehosophat*, was discontinued.

A sort of guide-book for pilgrims, written by Fra Noe, of the Franciscan Order, of uncertain date, but apparently of about the middle of the sixteenth century, states that nothing remained of ancient times except the Golden Gate and some antiquities in the church of the Franciscans of the Cenaculum. The only important fragment of earlier Jerusalem left in the course of reconstructing the mediæval walls in 1516-1542 was the Golden Gateway. This most interesting late Roman monument does not come within the range of the present notice, except in as far as it affords a singular contrast with the characteristic mode of constructing gateways of Levantine cities during the Middle Ages. The old Roman gateway was with two side-by-side archways, with a straight cut through the wall, much in the way of the gates of Aurelian's wall round the capital. In the sixteenth century the Turks had a very different mode of constructing the entrances to their castles and cities. Rey, in his "*Colonies Franques de la Syrie*," draws attention to the great difference in style of design between the Christian and Mohammedan fortresses, and it is curious to find that which he identifies with the Mohammedans (and also with the buildings of the Order of the Temple) surviving at a period about three centuries after the Crusades. In nothing is this curious survival more noticeable than in the mode of constructing the city gateways. In the Mohammedan style the gateway, instead of being a simple archway defended by one or more portcullis, a drawbridge over a moat, a barbican, &c., as in European fortresses, is always planned on a crooked principle, by which the assailants, after forcing the outer gate of wood and iron, found themselves inside a vaulted passage turning either to the right or left, at the end of which was another heavily constructed gate. By this system the assailants were trapped in a small space and at the mercy of the defenders of the fortifications, who could kill them off through loopholes arranged for the purpose. It will be noticed that all the gates of Jerusalem except the "Golden Gate," which was preserved by the Turks as traditionally built by Solomon the Wise, are planned on this principle, a system evidently found sufficient for the purposes of Eastern warfare before the introduction of more scientific gunnery in the seventeenth century. Such a plan for a gateway almost prohibits the entrance of wheeled vehicles into a town, and until the last few years, when the Bab Sitti Mariam and the Jaffa Gate were altered for the purpose, Jerusalem was almost impracticable for carriages, the only entrance to the city large enough for such a purpose being the Damascus Gate, which still remains in the condition in which it was first built, and still affords an opportunity for the Arab "Arbughi," or coachmen, to display their skill in turning corners with the modern carriages, which nowadays have taken the place of horse litters. All the gates of Jerusalem are decorated with scraps of mediæval carving gathered from the ruined Christian churches, and used up in a meaningless manner. Capitals of columns stuck into the walling as brackets, archstones over windows which they do not fit, and odds and ends scattered about on the principle of shell grotto architecture, have a grotesque appearance. Such orna-

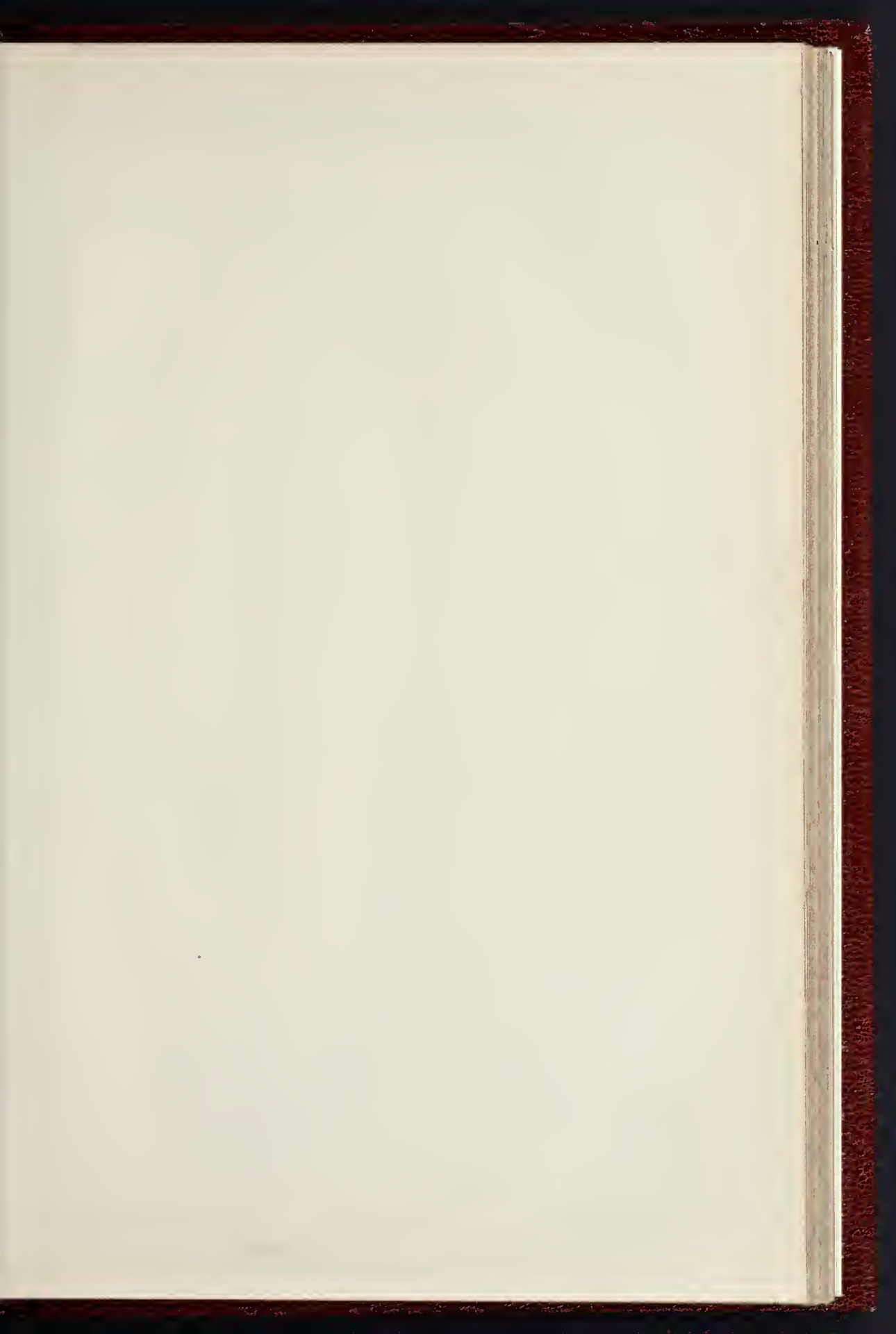
ments as seem to have been cut expressly for the position they occupy are of the most meretricious character. And here it may be noted that all over the walls as well as on the gateways a feature presents itself peculiar to the Levant. In the true mediæval fortresses it was the custom to utilise the granite, marble, and stone columns of the old Romano-Greek cities such as *Cæsarea*, *Jerusalem*, *Askalon*, &c., as bond stones in the thickness of the walls. They seem to have been specially adapted to resist the effects of mining and battering. In the sixteenth century walls of Jerusalem this older style of construction has been imitated with a very curious result. But at this period the supply of columns must have come to an end, or the mere appearance of such a system of building was thought sufficient, and so Suleiman the Magnificent was content with a series of round *patere* dotted over the surface, each one of which is generally carved with a different design of the usual interlacing Arabic style, and slightly projecting from the wall to represent the section of column. The result is as unsatisfactory as such a tawdry sham might naturally be expected to produce, and adds to the unreal character of the work as fortifications.

Jerusalem, since the Middle Ages, has never been provided with any regular trenches or other usual elements of fortification. Merely this imposing wall, three miles in length, and of an average height of about 30 ft., has formed for three centuries and a half an enclosure to the Holy City. Since it was built the city has only once been subjected to a hostile attack, and that from the very Turks who built its wall. In 1825 the inhabitants endeavoured to resist an imposition of taxes, but were quickly persuaded in the matter by a slight bombardment.

SCULPTURE AT THE ROYAL ACADEMY.

It can hardly be said that there is any great work in sculpture in this year's Academy. Of the colossal seated statue of the Queen by Mr. Onslow Ford we have already spoken. As a monumental statue it is broad and dignified in treatment, but we can hardly regard this class of work as fulfilling the highest aims of sculpture; still less the large bronze realistic figures of Cromwell and Dean Hook, by Mr. Pomeroy. It is to be supposed that people will have statues of this kind, but it is rather regrettable to see an artist of Mr. Pomeroy's attainments engaged upon them, when he might be so much better employed.

Taking the other works in the octagon in the order of placing, we come first on a piece of decorative work by an Italian artist, Signor Sortini. This is a model of a bell covered with bas-relief subjects, which are well treated in themselves, but the bell is the wrong shape and proportion for producing tone, being too high and narrow in proportion, and a worse fault is that the hanging loop is formed by figures of angels, which are thus put to a function for which they are quite unsuitable, and which is a degradation of the figure from being a source of expression to acting as a mere mechanical connexion. Mr. Toft's "Spirit of Contemplation" represents a nude female figure seated in a rather too



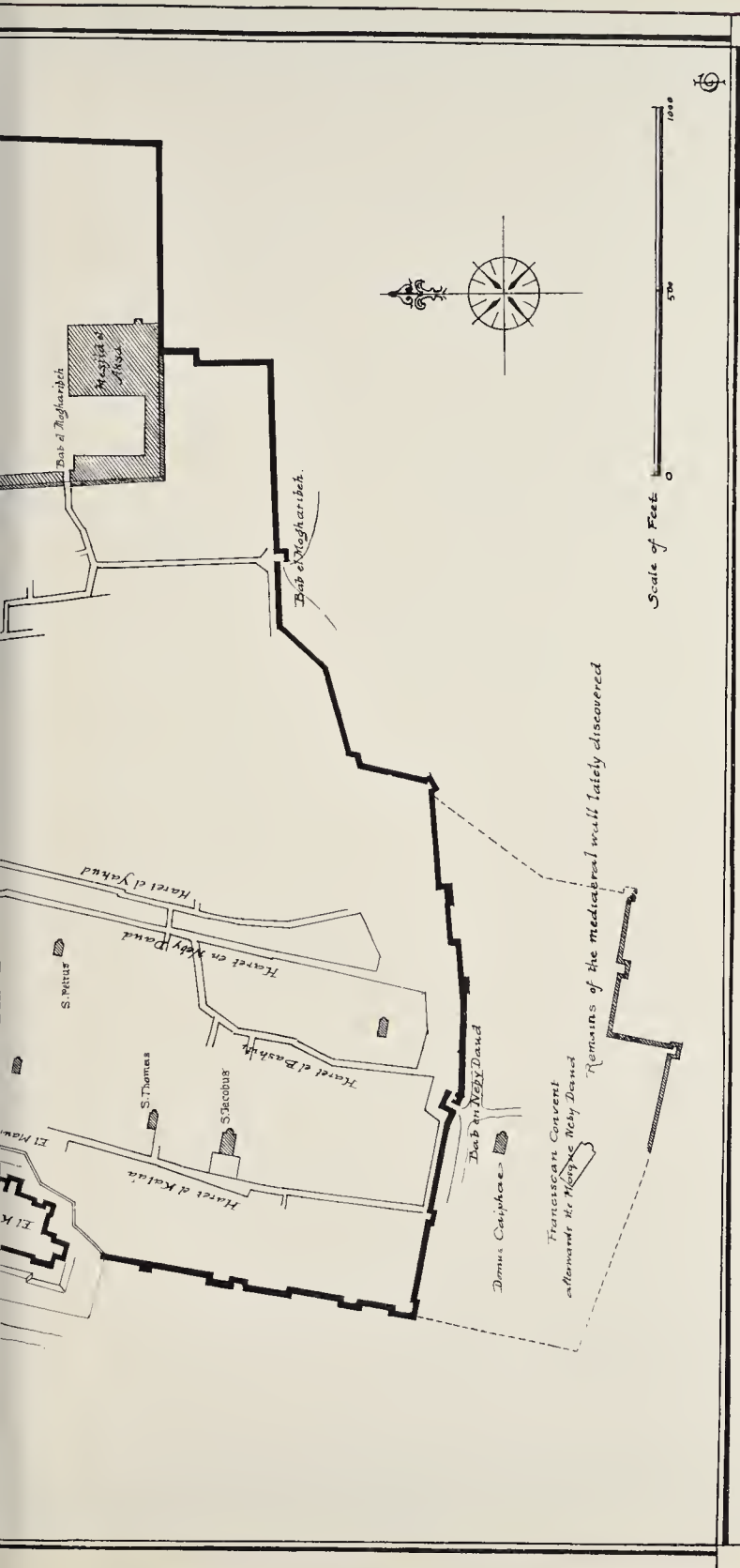
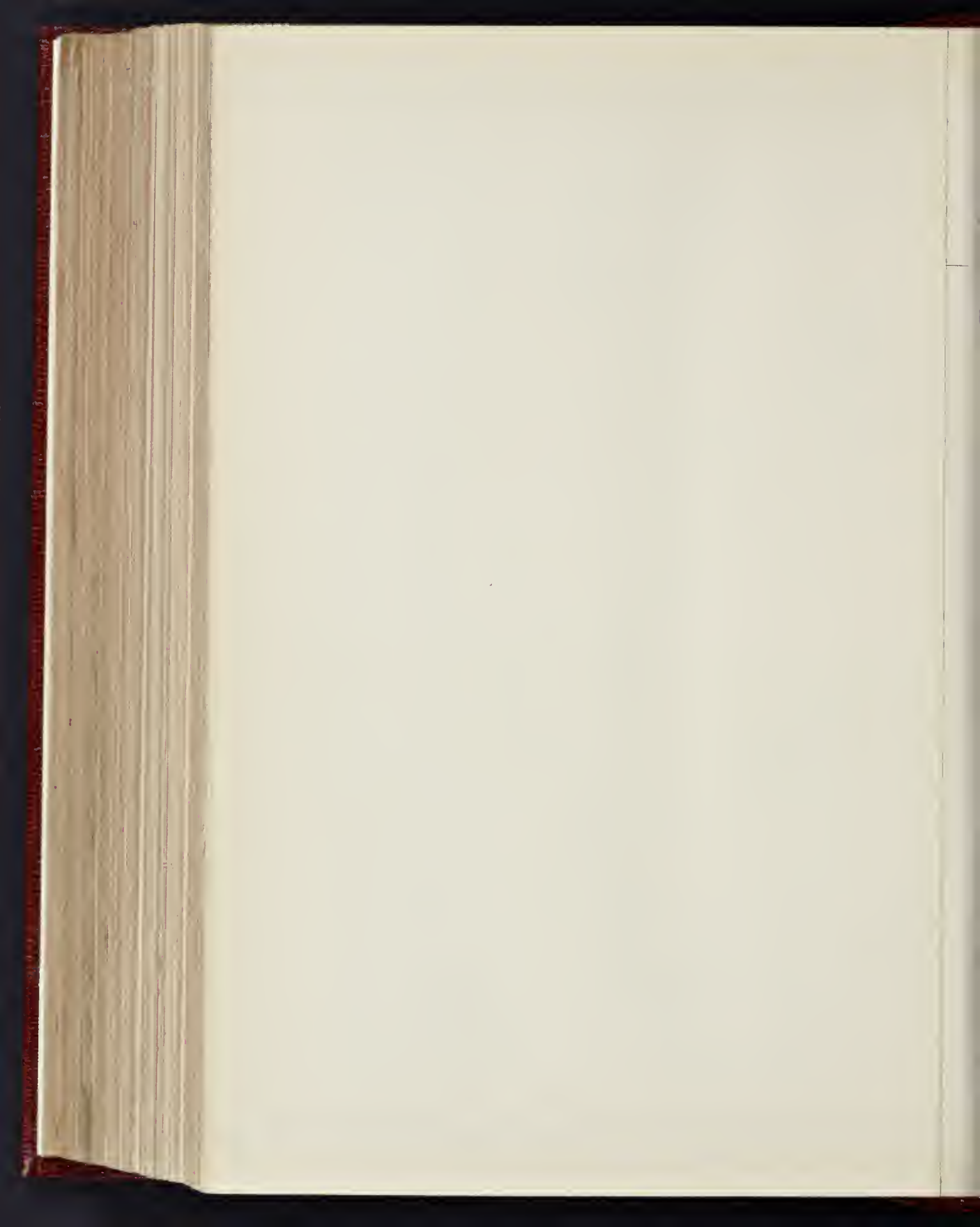


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THE MODERN WALLS OF JERUSALEM.—FROM A PLAN BY MR. GEO. JEFFERY, ARCHITECT
 (See first article in this issue)



in Prescott-street, Goodman's Fields. Having been incorporated in 1758, it was removed to its present site next eastwards of "the Horn-work" or "Mill Mount," one of the earthworks thrown up in the winter of 1642-3, when the King's headquarters were at Oxford. In 1781-3 the buildings were enlarged by James Spiller, and subsequently by Wood, and John Robinson. The "Alexandra" wing, for seventy beds, was added in 1864; in 1876 Queen Victoria opened the "Grocers'" wing, the accommodation being thus raised to a total of 776 beds.

On Friday last week the Archbishop of Canterbury dedicated an open-air pulpit, which has been erected at a cost of 200*l.* in the graveyard of Christ Church, Spitalfields, (Hawkesmoor, 1714-29), as a memorial of the late Dr. Billing, Suffragan Bishop of Bedford for the East End of London, who was rector of the parish for a period of ten years. The old open-air pulpit-cross, where the Spital Sermons used to be preached, was pulled down in the course of the Civil War. It had been rebuilt, 1594, in the place of one which stood in the churchyard—since Spital-square—of the Priory Hospital founded at the close of the twelfth century by Walter Brune and his wife Rohesia, and dedicated to Christ and the Virgin Mary. There are three other open-air pulpits in London: at St. Bartholomew Church, Bethnal Green (Railton, 1843-4); St. Mary Matfelon, Whitechapel (E. C. Aytton-Lee, after the fire of August 26, 1880), built in memory of Dean Champneys, who had been rector during twenty-three years; and, in 1892, in a window in the south wall of Holy Trinity Church, Marylebone-road (Sir John Soane, 1824-8), erected as a memorial of Canon Cadman, a former rector of the parish.

In the May number of the "Proceedings of the American Society of Civil Engineers" will be found an exhaustive paper recording the results of a series of experiments, commenced in 1893 and continued until 1899, by the chief engineer to the Board of Water Commissioners of the City of Detroit, Mich. The purpose of the investigation was to determine the effect of curvature upon the flow of water in closed circular conduits under pressure, and particularly to examine the effect of changes in radius of curvature upon the losses of head in those cases occurring in ordinary waterworks distribution systems. As the paper covers nearly two hundred pages, and includes numerous tables, figures, and plates, we may reasonably abstain from detailed discussion of its contents, and pass on to the most important of the various demonstrations which they afford. The experiments, taken as a whole, appear to prove beyond question that hitherto accepted ideas of the laws governing curve resistance are wholly in error. The resistance due to curvature is shown to be very much less in short than in long radius curve, for the same total length of pipe and angle of deflection. From many experiments upon a 30-in. and a 12-in. pipe, it is apparent that the 90 deg. curve involving the least resistance in a total length of 80 diameters is one between 2 and 2½ diameters radius. This result—or perhaps we ought to say discovery—is sufficiently startling, and, presuming the accuracy of the observations, its meaning is that the theory and

practice regarding curve resistance, as set forth in the hydraulic treatises of all nations up to the present time, are absolutely inaccurate, and are diametrically opposed to the true conditions. The authors do not profess by any means to have exhausted the subject, and as their investigations merely refer to curves of 90 deg., and do not extend to the long radius curves occasionally used, there is ample room for further inquiry.

THE Electrical Review published last week the paper which was recently read to the American Institution of Electrical Engineers by Dr. Kennelly describing a novel storage battery invented by Mr. Edison. This new cell is a very distinct advance on anything that has hitherto been done, and if Mr. Edison can supply it, as he says he can, at the same price as the ordinary lead storage cell of commerce, it will revolutionise many of our methods of electric traction. In practice a good lead battery can be got which will give a horse-power per hour at its terminals for every 150 pounds of its weight. It is stated that the Edison cell gives a horse-power per hour for every fifty-three pounds of its weight, an advance which is in itself quite sufficient to make electric traction for motor cars a commercial success. It will be remembered that the London Electric Cab Company failed because the batteries were ruined by being allowed to run down too far. Dr. Kennelly states that this new cell can be allowed to run down until there is no charge left in it without doing it any harm. In fact, a cell has been discharged and then charged up in the reverse direction without doing it any real damage. The negative pole, that is the one corresponding to the zinc of a primary battery, is iron, and the positive pole is a special superoxide of nickel. It is therefore a nickel-iron cell. The positive and negative plates of the battery are mechanically alike. They consist of plates made of thin sheets of steel 0.024 in. in thickness, out of which rectangular holes are stamped. Each opening is filled with a shallow perforated steel box nickel-plated containing a briquette of the active material. The plates are finally placed in a 20 per cent. solution of potassium hydroxide contained in a vessel made of sheet steel. This electrolyte does not attack any of the parts of the cell, nor are any of the ingredients forming the briquettes soluble in it. The electro-motive force of the cell when fully charged is 1.5 volts, and it is stated that it can be charged in an hour, although the most economical rate of charge is three and a half hours. There is no more important problem at the present time in connexion with electrical engineering than the invention of a light storage battery, and Mr. Edison's invention has naturally aroused the greatest interest.

THE Art for Schools Association has just issued its Annual Report for 1900. The work of the Association, as many of our readers are aware, is to supply elementary schools with good prints and photographs of beautiful and interesting works of art, with the idea of interesting children in pictorial art, and thus prepare the way for the work already being done by loan exhibitions of pictures in poor districts of London and

other large towns. The Association supply these schools at prices allowing a mere nominal profit, and they have, therefore, in order to secure a regular income, started a publishing business supported by annual subscribers, who receive, in return for their subscriptions, copies of all the publications of the Association. These publications are issued annually, and consist of historical subjects, studies of natural objects, and reproductions of standard works of old masters. The usefulness of the Association depends largely on the number of annual subscribers, who by their help enable it to respond to the increasing calls of numberless schools which are anxious to avail themselves of these publications. The number of these sold last year was nearly 5,000.

Fine Art Society's Gallery. THE water-colour drawings by Mr. Arthur Severn, at the Fine Art Society's Gallery, form an interesting collection, some of them very beautiful. A considerable proportion of them may be classified as studies of special effect in landscape. Thus we have "Abbeville by Moonlight" (13), a very moonlight effect except that the towers of the church, with the moon behind them, show rather too much colour for moonlight—this seems to have been purposely done to enhance the cold tone of the moonlit portions of the scene. "Sun effect Cumberland Coast" (23), is good, but open to the objection that the sun is far too large in scale; "Sunset Cloud over the 'Old Man, Coniston'" (28), is fine; "Rain Cloud effect at Sunset, Trouville" (32), and "Early Morning, Cannes" (37), seem rather exaggerated, but may not be so. The finest drawing in the collection is, to our thinking, "Cumulus at Sunset, Cumberland Coast" (18). One or two sea studies, especially "Sea at Alassio," are very free and effective. The "Drawings of Birds and Animals in Motion," by Mr. J. Guille Millais, in the same gallery, are not very artistic in quality; they impress us rather as the observations of a keen sportsman with a talent for drawing, and are in that sense interesting, though disappointing as works of art.

The Modern Gallery. AT the Modern Gallery, 175, Bond-street, is a collection of water-colour drawings by Mr. and Mrs. Albert Stevens—"Gardens at Home and Abroad" and "Sunshine and Shadow in Foreign Lands." The collection includes 130 drawings, many of them of great merit, showing a broad style of work and a good perception of colour effect. The large drawing "In the Olive Woods Cap Martin" (122), by Mr. Stevens, is an admirable work; and many others may be studied with pleasure; we may mention especially Nos. 20, 32, 39, 66, and 69. The work of the two artists is distinguished by the letters "A.S." or "M.S." in the catalogue. We must confess that the artistic honours seem to rest with the gentleman rather than with the lady; at least, we find that nearly all those we had marked as especially good bear the "A.S." initials; but Mrs. Stevens's "Old Vicarage Garden, Norfolk" (7), is an exception, and is a charming bit of colour.

ADDITION TO NEWHILLS CONVALESCENT HOME, ABERDEEN.—Tenders have been accepted for a new wing for sixteen consumptive patients—a new branch of treatment at the institution. Mr. George Coult, Aberdeen, is architect.

THE SAFETY OF ST. PAUL'S CATHEDRAL.

AFTER many years conflict with vested interests and other inimical forces, the tubular railway system has become an accomplished fact and a popular institution. Apart from criticism upon some matters of detail, nothing but praise was awarded to the two first electric subways of the metropolis. When the third was finally opened for traffic, and numerous Bills were deposited for the consideration of Parliament relating to further undertakings of the kind, the inhabitants of London began to feel assured that the true remedy for congested traffic had at last been placed within reach. Moreover, there appeared every reason for believing that the remedy would be unattended by disadvantages, such as sometimes attend the employment of therapeutic agents in the practice of medicine. The solid bed of clay underlying the metropolis to a depth of some 100 ft. was almost universally regarded as affording an ideal matrix for the production of innumerable underground railways. It was assumed that the stiff and tenacious nature of the material would permit of endless burrowing, and that the restless activity of the busy hive below would be unheard and unfeared at the surface. It was with sincere regret that we found reason to doubt the accuracy of the latter assumptions. First came complaints from residents along the line of the Central London Railway of undue vibration and noise, and then suggestions that the stability of buildings might be seriously affected by the same undertaking. Some of us were possibly inclined to regard the contentions of property owners as somewhat fanciful, and no doubt the advocates of such were in duty bound to present their cases in the most forcible manner, but no one now denies the fact that undue disturbance has followed the construction of the railway. Eminent authorities attributed this unfortunate result to defects in the design of the rolling stock, and in the construction of the permanent way, and consoled us by the hope that when these faults had been remedied there would be no further cause for anxiety. Nevertheless, we believe the travelling public must be prepared for an access of watchful opposition on the part of the property owning public to all new lines projected beneath the metropolitan area. Perhaps one of the most serious of the evils apprehended is injury to the historic buildings to be found in various parts of London. Already it is the fact that the spire of Bow Church, in Cheapside, is nearly two feet out of the perpendicular, and this deviation is attributed to excavations in connexion with the Central London Railway. The accuracy of this view has not yet been established, but the fact that it is seriously advanced is sufficient to prove the uneasy feeling that exists with regard to low-level lines in the metropolis. Bearing in mind the previously considered points, we can quite understand the anxiety entertained by the Dean and Chapter of St. Paul's Cathedral as to the possible effects that might attend the construction of the proposed City and Piccadilly Electric Railway. Archdeacon Sinclair, who has doubtless had the benefit of technical advice, recently said that as the soil under Ludgate-hill and the immediate neighbourhood is chiefly made up of loose gravel and sand, any excavations which would tend to drain off the underground water, would, in all probability, cause a crack in the extensive block of concrete upon which the Cathedral rests. In such an event, the authorities believe a collapse or a settlement of the building might result, and the example presented by the Church of St. Mary-le-Bow in no way tends to allay their apprehensions. We observe that the promoters of the new line make the announcement that a deviation will be made in the vicinity of the Cathedral so as to ensure the avoidance of possible injury; but if there is to be any excavation, tapping underground springs at a lower level, the diversion could hardly possess the anticipated virtue.

Our readers will no doubt remember that the pioneers of low-level railways have always spoken of the London clay as a stratum, impervious to water, in which tunnels might be cut as safely and easily as a mite eats its way through cheese. The fact is, however, that the tunnels of tubular lines are not invariably driven at a level where continuity of the clay can be assured. Trouble has before now been caused by the presence of water, coming down through faults in the clay or met with during

occasional penetration of the overlying beds of sand. In such cases, it would naturally be futile for the engineers to attempt draining off the underground water in the manner apparently suggested, or feared, by the authorities of St. Paul's. No engineer in his senses would dream of such a thing, and, as our readers are well aware, operations are conducted in all cases of the kind by the aid of compressed air until the springs are permanently sealed by the finished tube with its impervious grouting. Very likely the proximity of a subway to the upper edge of the clay may tend to accentuate vibration under certain conditions, but we cannot understand how any settlement can be caused so long as the tube remains intact and dry.

The methods adopted by coal and salt miners are constant sources of inconvenience in the North of England, but similar practice does not enter into the philosophy of the deep-level railway engineer, and it is very difficult to understand how injury to surface buildings may be expected to result from his work. At the same time, it must be remembered his operations are conducted in an unknown and unexplored land, where unexpected problems may arise to baffle the most carefully-laid plans. At no distant date we may expect to find the question discussed fully, and we shall then know better than at present how far the fears of the Dean and Chapter may be justified, and whether the safeguards proposed by the railway company may be looked upon as entirely satisfactory.

THE INTERNATIONAL CONGRESS OF FIRE BRIGADES AT BERLIN.

ON Thursday, the 6th instant, the International Congress of those interested in fire brigade work and cognate subjects, which has been organised by "Le Grand Conseil International des Sapeurs Pompiers," was opened at 10 a.m. by a formal and ceremonial meeting under the Presidency of the Minister of the Interior, at the Imperial Houses of Parliament. The House of Representatives in which this meeting, as well as the subsequent business meetings of the Congress, was held could only accommodate a small proportion of the 2,000 members attending the Congress.

After formal addresses of welcome and thanks by representatives of the various nationalities present, the following papers were read—(1) "The Relations between Fire Brigade Work and Building Regulations" by Fire Brigade Inspector Kleber, of Stuttgart; (2) "The Automobile Traction of Fire Engines" by Captain Cazier, of Creil, France, Vice-President of the "Grand Conseil des Sapeurs Pompiers"; (3) "The Organisation of the British Fire Prevention Committee and its Investigations with Fire-resisting Materials" by Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee; (4) "Smoke-resisting Apparatus" by Captain Welsch of the Fire Brigade of Ghent.

In the afternoon a visit was made to the highly-interesting and well-organised works of the General Electrical Company, in whose two factories (connected by an underground railway) over 6,000 men are employed in the manufacture of electrical apparatus.

In the evening a formal dinner, attended by about 400 members, was held in the restaurant of the "International Exhibition of Fire-prevention and Fire-combating Appliances," an exhibition organised in connexion with the Congress, and of which we shall give a detailed description in a future number.

On the following day, Friday, the 7th inst., the Congress resumed work at 9 a.m., and the following papers were read—(1) "The Participation of Fire Insurance Companies in the Cost of Fire Protection Generally," by Fire Brigade Inspector Krameyer, of Merseburg. This led to an animated discussion, after which a resolution was carried by a large majority affirming the desirability of fire insurance companies being compelled by law to contribute towards the expense of maintaining fire brigades, a decision by no means surprising seeing that almost every one of those present was a member of a fire brigade, that so realistic opinion is strong in Berlin, and that municipal insurance, rather than underwriting by public companies, is a considerable element in Germany, where, indeed, it may be said that fire insurance companies are to-day fighting for their lives with the odds, in public opinion,

heavily against them. The remaining papers were (2) "Remarkable Fires in Russia, and the Question of Fire Extinction and Water Supply in Extremely Cold Weather," by Lieut.-Colonel E. von Lunds, Fire-Brigade Major, of Odessa; (3) "Fire Protection in Warehouses," by Fire Brigade Director Rabstrat, of Stettin; (4) "The Development of the Carbonic Acid Fire-engine and its use in combination with Steam Fire-engines and Hydrants," by Fire Brigade Director Dittmann, of Bremen; (5) "Electric Lighting Installations as the Cause of Fires, and their Comparison with other Lighting Systems," by Signor Ugo Penné, First Lieutenant of the Milan Fire Brigade; (6) "The Use of Small and Large Hose," by Captain Müller, of Vienna; (7) "Fires on Board Ship and Cotton Fires," by Fire Brigade Officer Präbels, of Hamburg.

The social functions of the Congress for this day comprised a visit in the afternoon to the Royal Palaces; a fire brigade parade in the courtyard of the head fire station, where the methods of training firemen and of turning out on receipt of a call were illustrated; and in the evening a popular concert in the Zoological Gardens. There were besides several semi-private dinner parties, including that given by Mr. E. O. Sachs and the Executive of the British Fire Prevention Committee at the Hotel Bristol, which included amongst the guests the British Ambassador, Sir Frank Lascelles; Herr Hinckeldey, Director of Public Works, the Prussian Ministry of Works, President of the Berlin Architekten-Verein; Captain Gamble, of the London Fire Brigade; Major Fox, of the London Salvage Corps; Herr Westphalen, Chief Officer of the Hamburg Fire Brigade; Herr Dittmann, Chief Officer of the Bremen Fire Brigade; Herr Müller, Chief Officer of the Vienna Fire Brigade; Herr Meier, Chief Officer of the Amsterdam Fire Brigade; Count Komarovsky, of St. Petersburg; and Count Fernandez, of Oporto.

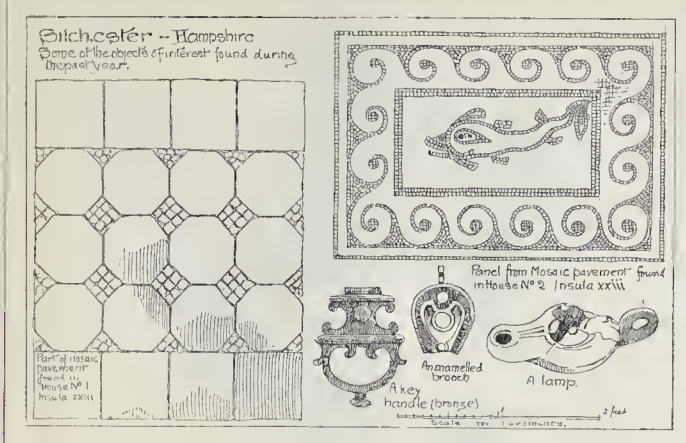
On Saturday, the 8th instant, the following papers were read (1) "The Benevolent Funds of the German Fire Brigade Unions," by Fire Brigade Director Weigand, of Chemnitz; (2) "Spontaneous Combustion," by Professor Dr. Madem, of Greifswald; (3) "Fire-resisting Construction and Materials," by Fire-brigade Director Prinz, of Altona; (4) "First Aid to the Injured, more especially in Relation to Accidents occurring at Fires," by Dr. Leu, Army Surgeon, of Berlin; (5) "Hydrants," by Fire-brigade Inspector Bahrdt, of Berlin; (6) "Description of the Installation of Fire Alarms in a Street in Amsterdam, by which each House can give an Alarm to the Fire Brigade," by Fire Brigade Director Meier, of Amsterdam; (7) "New Forms of Fire-alarm Apparatus," by Herr Grebel, of Berlin.

On the social side were visits to the establishment of Messrs. Wertheim, the Whiteleys of Berlin, and to the factory of the Berlin Electrical Company, whilst in the evening a reception, attended by some 800 members of the Congress, was given by the Mayor and Corporation of Berlin in the Town Hall.

On Monday, the 10th inst., pleasure alone was the object of the Congress in the form of a steamboat excursion and a visit to the cable factory of the General Electrical Company.

From the nature of the papers read and the fact that some 2,000 members attended the Congress from all parts of Germany, from Austria, France, Russia, Italy, Denmark, Holland, Belgium, and the United States, it can be seen that the occasion was one of considerable importance as well as usefulness, in which England was represented by officers of the London Fire Brigade and Salvage Corps, the fire brigades of Manchester, Liverpool, and Birmingham, and several members of the National Fire Brigades Union and of the executive of the British Fire Prevention Committee.

COAL SMOKE ABATEMENT.—We are informed that the Coal Smoke Abatement Society are about to make a series of tests upon domestic grates, with the object of ascertaining the following facts:—1. The amount of fuel consumed when burning under ordinary conditions. 2. The amount of smoke emitted. For the present the lists will be limited to open sitting-room grates burning either bituminous coal or coke. The society invite manufacturers and patentees to submit a grate for this purpose. The only condition imposed is that the grate should be fixed and taken away by them at their own cost. The tests will be made in the Westminster district. Application to be made to Mr. E. Jackson, Secretary of the Coal Smoke Abatement Society, 59, Chancery-lane.



SILCHESTER.

AMONG the many objects of interest found in the excavations at Silchester during the past year a small proportion only are of strictly architectural character. Apart from the houses themselves, the planning of which is always interesting, some pavements have been discovered in the houses Nos. 1 and 2 in Insula No. xxiii, near the north gate. The most ornate was found in house No. 2, and consisted of four panels surrounded by an ornamental border. Of these panels one is destroyed, two have a conventional pattern, and the fourth has a dolphin. The groundwork of the pavement was of chalk tesserae, the dolphin and border being in grey tesserae, with a few red fragments introduced into the fins, head, and tail. Of considerable interest is a plainer pavement found in house No. 1, an example of *opus sectile* and *opus tessellatum*. A small piece of the original is exhibited in a frame, and here illustrated. The squares and octagonal pieces are of brick, the intermediate spaces being filled with chalk tesserae. These pavements have all been carefully drawn to scale by Mr. G. Fox, and his beautiful measured and coloured drawings are hung on the walls. A great deal of pottery was found, many of the objects being in a very perfect state; and in one of the numerous pits was a horde of iron tools, including smiths' tools, a scaber, or buttrice (an instrument used by farriers), a shoemaker's anvil, carpenters' tools, armourers' scythes, anvils, and a remarkable fragment of a ladder. There are likewise many padlocks, chains, and handles, a bronze steelyard weight in the form of a bust, a bronze key handle, several examples of brooches (one or two enamelled) and other personal ornaments, fragments of glass, a lamp, and many pieces of painted plaster from the walls of the houses.

Other details will be found in the *Builder* for June 7, p. 544.
The exhibition closes to-day.

MAGAZINES AND REVIEWS.

THE *Art Journal* is almost entirely occupied with reviews and illustrations of the Academy, the New Gallery, and the Glasgow Exhibition. The article on the Academy is more remarkable for verbiage than critical insight, as may be gathered from the mere fact that the writer omits all mention of Mr. Wyllie's sea picture of the Bay of Biscay, perhaps the most powerful work of the year.

The *Magazine of Art* is also largely occupied with reviews of contemporary exhibitions; but it includes an interesting article on "Artists' Studios—as they were and as they are," though this article is apparently entirely occupied with studios "as they were," illustrated by representations of studios by the artists themselves; some of them perhaps realistic, some obviously imaginative. Possibly the subject is to be continued for the consideration of studios "as they are," though there is no intimation of this. An article on the "New Salon of 1901," by M. Henri Frenet, is an absurdly optimistic estimate of a very weak exhibition.

The *Studio* contains two articles of considerable interest on two special forms of artistic work: "The Medallist's Art," by Mr. Roger Marx, and "The Art of True Enamelling upon Metals" by Mr. Alexander Fisher; the latter partly practical, partly philosophical; the philosophic element is indeed rather too predominant, and includes a good deal of rhapsodising which is of no particular value. However, the article is to be continued, and will perhaps take a more practical turn in the sequel.

In the *Architectural Record* Mr. Montgomery Schuyler, writing under the heading "Nouveautés de Paris," draws attention to some recently erected Paris house fronts which go out of the usual very conventional line of Paris street mansion architecture. Yet, while we certainly agree that the average street architecture of the better streets in Paris is far too much conceived on one model, the one or two examples of this conventional Paris style which are given in the article are superior in architectural dignity and in the quality of style to the exceptional examples which are illustrated. One or two public buildings of Paris are included in the survey, and the author, we are glad to see, does full justice to the Musée Galliera, which he rightly estimates as "one of the most beautiful things in Paris." The illustrations of "Some Recent American Designs" are occupied with two buildings, a millionaire's residence designed by Messrs. McKim, Mead, & White, and the New York Yacht Club, designed by Messrs. Warren & Wetmore. The illustrations of the mansion are all interiors, which owe their effect as much to the general treatment of furniture and embellishments (which may however be the architects' work) as to architectural design in the stricter sense; the exterior is not illustrated. In the Yacht Club House the exterior façade is exceedingly French in type, except in the curious and most unsatisfactory treatment of the loggia story at the top, with apparently an open timber joisting as its only cover, the ends of the joists projecting over like so many spikes; the appearance of this, at the top of a very substantial stone elevation, is most absurd, unless indeed it represents something which is unfinished, in which case the photograph should have been deferred till the building was completed. The interiors show a bold variety of treatment; the "model-room" has a most "robustious" marble fireplace, also exceedingly French in design; the grill-room is designed in imitation of the "between decks" of a ship—a little architectural joke which however seems out of keeping with the remainder of the interiors. "Recent Domestic Architecture" is chiefly occupied with the illustration of another very costly mansion, very dignified and satisfactory in exterior design; in this case plans are given, which are of some interest as showing the arrangement of the principal or reception floor in a first-class American mansion. What is called the breakfast-room is a very large bay opening out of the dining-room, and apparently (from the dotted lines) capable of being curtained off from or thrown into the main room, at pleasure; there is something in this suggestion.

The aspect compass of the plan is not given. Signor Melani contributes an article (translated) on "Modern Italian Architecture," a subject on which no Italian architect can be trusted to write, as his view of the subject is sure to be so merely local, national, and partial. The structures illustrated, and named with praise, include Signor Antonelli's "Mole" at Turin, an illustration of which was sent to us some time since, which we refused, not thinking it worth while to publish so hideous a monstrosity. The Ponte Nuovo at Pisa is a pleasing and well-proportioned bridge structure, and the modern synagogue at Florence has the merit of architectural unity of conception.

The illustrations of the *Berliner Architekturwelt* are still extensively occupied with the recent competition designs for the Charlottenburg bridge, which show some very fine and bold conceptions; it is in designs of this class that the architectural genius of modern Germany shows at its best. A children's hospital (Kinderasyl) in the Kürassier-Strasse at Berlin, by Herr Hoffmann, is a very pleasing building, both in general character and in many of the details.

In the *Artist* there is published a plan, by a "correspondent" whose name is not given, for a site for the proposed monument to Queen Victoria, in the centre of a proposed double crescent laid out to east and west of the new Holborn to Strand street, the memorial to be placed in the axis of the street. We do not think the idea has anything to recommend it. The neighbourhood is not the right one for such a memorial, and it would form a serious cause of delay that all the traffic should have to circulate round the great curve proposed, instead of taking the shortest route.

Feilden's Magazine continues Mr. Maxwell's useful and fully illustrated essay on "The Town Refuse Problem"; and there is also a valuable article by Mr. Archibald Little on "The Automatic Transmission of Material."

The *Engineering Magazine* contains Mr. Phillips's second article on "Competition in Iron and Steel Making," the main point of which is to consider how England is to hold her own against American enterprise and competition in this department of industry. And the conclusion is that if the men and their unions, will not co-operate with the employers in working with the best and newest labour-saving methods, successful competition is impossible. The same number contains an interesting article on personal recollections of Ericsson.

In the *Nineteenth Century* Mr. H. Hamilton Fyfe writes a short article on "Mr. Sargent at the Royal Academy." He commences by assuming that every one is wearied and depressed by a visit to the Academy exhibition, a position which we deny, and which is a mere piece of cant of the day; it is the fashion to sneer at the Academy, but for those who can find no interest at all in the annual Academy exhibitions we should say that the fault lies in themselves. The further argument is that the reason for this lack of interest lies in the fact that the painters have nothing original or striking to give us; that this is only not true in regard to Mr. Sargent; but that his failure lies in the fact that, though original he is not beautiful; in which there is truth. Burne-Jones's fame, as Mr. Fyfe says, lay in the fact that he had a clear ideal of what constituted beauty in art, and pursued it without swerving; and the one thing needed, he thinks, in Mr. Sargent's art is this quality of the ideal—"of imagination striving towards the noble and the beautiful, shrinking from the common-place and from all that is not lovely and of good report." He regards Mr. Sargent's sculpture in this year's Academy as an exception, and we agree with him in so far as that this work shows a distinct endeavour after beauty of design; but when he says that "the ideas which this fine work conveys are of the first order," we must again take exception. The idea of the work seems to us to be that of a repellent and painful superstition, but it is a fine work in a decorative sense. In regard to Mr. Sargent's pictures, however, we think he has hit the truth. They are remarkable for immense power of execution, without the sentiment of the beautiful; and it is as well that this should be recognised.

The *Pall Mall Magazine* contains an article by Mr. F. Wedmore on the French painter Chardin, which is a piece of fine and superior criticism. He contrasts Chardin with William Hunt, whose imitations of facts in Nature are

so clever, yet they are "never nobly seen." "Clever man as Hunt was, when you have tasted Chardin's art the savour of the art of William Hunt has gone out for ever." This may be a little too strongly put, but there is no doubt that too much has been made of Hunt's realism, which rarely if ever went beyond realism.

Scribner, in "The Field of Art," gives a criticism of the buildings and sculpture of the Buffalo Exhibition, but in default of illustrations one cannot gather anything special from it, except that we note that it had been determined that, in view of the picturesque quality of the park in which the exhibition was situated, the exhibition buildings themselves should be laid out on strictly symmetrical lines as a contrast; which seems a right view to take.

In the *Century* "Cole's Engravings of Old Masters" is represented by an engraving from Wilkie's "Boys Digging for Rats"; the light and shade effect of the picture is admirably translated in Mr. Cole's broad woodcut style, and it is surprising how well he has got the character and expression of the faces, on so small a scale, without departing from the prevalent texture of execution of the whole engraving. "The Centre of the World of Steel" (or what an American magazine calls the "center") is an interesting illustrated article by Mr. Waldon Fawcett on the work at the Pittsburg foundries.

We have received also *Harper*, the *Revue Générale*, the *Gentleman's Magazine*, and *Knowledge*.

THE SETTING OF PORTLAND CEMENT.*

BY GAVIN J. BURNS, B.Sc., F.S.I.

PORTLAND cement, as commonly manufactured, consists of a fine powder composed of grains of irregular shape, varying in size from $\frac{1}{100000}$ th to $\frac{1}{2500}$ th of an inch, and averaging about $\frac{1}{20000}$ th of an inch. The grains are mostly transparent and crystalline in structure. A few opaque grains are interspersed among the others.

The specific gravity of the grains is 2.7. A bushel measure of cement weighs about 112 lbs. when loosely filled. This is equivalent to a specific gravity of 1.4. Consequently, in a bushel of cement about one-half the bulk is cement and one-half interstices. The weight of a bushel of cement, however, is of no scientific value, because the apparent heaviness of the cement depends on the capacity of the measure. A small measure filled with cement is only a trifle heavier than the same measure filled with water. When mixed with water and allowed to set, the powder absorbs 30 per cent of water and yields a pat having a specific gravity when wet of 1.92 to 2.01. Briquettes made for testing, which have been allowed to soak for a week in water after being made, have a specific gravity of 1.95 to 2.15 when dry. A high specific gravity generally denotes a high tensile strength, as the following examples show:—

Specific Gravity.	Breaking Strength in lbs. per sq. inch.
2.04	295
2.05	325
2.05	440
2.08	460
2.10	550

The above specific gravities refer to the samples when dry. If they were saturated with water the figures would be 4 or 5 per cent higher.

In ascertaining the specific gravity of an absorbent substance like a briquette of Portland cement allowance has to be made for the absorption of water during the process. This can be easily done in the following manner:—Weigh the specimen in air; call weight in air *a*. Weigh again in water; call weight in water *b*. Take the specimen out of water immediately, and weigh while still wet a second time in air; call this weight *c*. Then specific gravity equals $a/(c-b)$.

It appears from the foregoing figures that if a bushel of cement weighs 112 lbs., it shrinks about 10 per cent, in bulk when set.

Part of the water used in mixing is simply held mechanically in the pores of the cement. This water evaporates on drying in a warm

* This is reprinted from the "Professional Notes" of the Surveyors' Institution; but the diagram showing the microscopic appearance of Portland cement in setting has been specially made by the author for this publication.



SCALE
0.005 0.01 Inch

Microscopic View of Portland Cement in Course of Setting.

place. The remainder of the water enters into chemical combination with the cement in the form of a hydrate. The amount of water in chemical combination varies with the time the cement has been mixed. If a sample of cement is mixed and allowed to dry at once, the amount of water chemically retained is about 7 per cent. After the sample has been kept under water a week, the proportion increases to 17 per cent. The chemically-combined water is driven off at a dull red heat. Decomposition begins, however, at a lower temperature. This is shown by the fact that a briquette loses its strength when heated. Some sample briquettes which had been heated for four hours to a temperature estimated at 500 deg. were found to have been reduced to one-half their original strength.

So far as I am aware, the process whereby cement, on setting, is converted into a solid mass has never been fully investigated. The cement itself is known to be a compound of silica, alumina, and lime, or a mixture of several compounds of these substances. It is also known that setting consists essentially in the formation of a hydrate. But it is not known precisely why the formation of a hydrate should cause the cement to set. Quicklime combines with water and forms a hydrate, but does not set; and there are many other substances which form hydrates, but do not show the phenomena of "setting." Why, then, should the combination of cement with water convert it into a substance harder and more durable than many kinds of stone?

Such being the case, I have tried to ascertain what information on the subject could be obtained by means of the microscope. A thin slice cut from a briquette of cement is easily seen to be a kind of conglomerate composed of opaque particles intermingled with transparent doubly-refracting crystals. In order to watch the process of setting a little cement may be dusted on a slide, an ordinary cover glass placed over it and fastened down, and the whole put into a dish of water. On examining the slide with a power of about 200 from time to time, it will be found that the grains of cement become covered with tufts of acicular crystals, which begin to make their appearance some times in half an hour, sometimes not for two days. The crystals are much too minute for their form to be observed, but they appear to be of uniform width, so may be assumed to be prismatic. The crystals appear to grow only in length, the width remaining constant. The greatest length I have observed is $\frac{1}{10000}$ th of an inch. The width was too small a quantity to be measured with the powers I have used, but is probably under

$\frac{1}{10000}$ th of an inch. The tufts of crystals generally spring from angles or prominences on the grains of cement. The crystals, in fact, somewhat resemble tufts of grass growing on rough ground. One can readily understand how the growth of these crystals on adjoining grains of cement, by interlacing with one another, unites the whole into a solid mass.

Let us consider a little more closely the manner of formation of these crystals. It may be safely assumed that they are produced by the combination of water with some constituent of the cement, and it is probable that this constituent is the active ingredient which causes the cement to set. Moreover, the definite form of the crystals implies that they have a definite chemical composition. It is also clear that the crystals are deposited from their solution in water, but that when once deposited they cannot be again dissolved. It appears, consequently, that Portland cement (or, rather, some one of its constituents) exists in two forms, one of which is soluble in water and the other an insoluble hydrate. In my opinion, it is to this fact that cement owes its power of setting.

In conclusion I may observe, as a matter of practical importance in the testing of cement, that the setting is greatly retarded by a low temperature. A briquette which has been kept in water only a few degrees above the freezing point will only stand about three-fourths of the stress which another briquette will stand which has been kept for the same time in water at 60 deg.

The accompanying sketch shows the appearance presented by Portland cement while setting, as seen under the microscope.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A special meeting of this Association was held in the Royal Institution on the 5th inst. Mr. Henry F. Kerr, the President, in the chair. The Chairman referred in fitting terms to the death of Mr. John M. Brydon, London, and it was resolved that an expression of the Association's regret and sympathy be sent to the relatives of the deceased. Votes of thanks were awarded to all who had contributed directly to the success of the recent visitations, Mr. J. G. Goodchild, of the Geoloical Survey, being specially mentioned in connexion with the "geological ramble" in the Queen's Park. Professor Baldwin Brown addressed the meeting on Durham, Hexham, and Chesters, with the view of conveying a general idea of the character and aspect of the principal buildings,

&c., to be visited on the occasion of the Association's annual excursion on the 14th and 15th inst. His remarks were illustrated by lantern transparencies.

ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—A special meeting of the Council of the Royal Institute of the Architects of Ireland was held at the Institute Rooms, 20, Lincoln-place, on the 5th inst., Sir Thomas Drew, the President, in the chair. The following resolution was passed unanimously:—"The attention of the Council of the Royal Institute of the Architects of Ireland has been directed to recurring instances in which county surveyors, under the new establishment of county councils, are engaging in private practice, both in architectural and engineering work. This Council are of opinion that in the interests of the public service it is desirable that the county councils should avail themselves of the powers conferred upon them by Section 115, Sub-section 18, of the Local Government (Ireland) Act, 1898, for the purpose of making such arrangements with the county surveyors as will enable them to devote the whole of their time to their official duties."

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting, Wednesday, June 5, Sir Henry H. Howarth, President, in the chair, Professor W. Boyd Dawkins gave an account of the exploration of the cairn at Gop, near Prestatyn, on the east side of the Vale of Clwyd, and of the cave discovered close by. The cairn, called in local talk the tomb of Queen Boadicea, consisted of a pile of blocks of limestone 330 ft. long, 223 ft. wide, and 46 ft. high. A shaft was sunk in the centre to the level of the solid rock, and from this three drift ways were carried along the line of the rock to a distance of 30 ft. with but negative results, the only remains met with being a few bones of sheep or goat, hog, and ox or horse of the usual prehistoric refuse-heap type. The stones were too loose to allow the exploration to be carried on further without timbering, and it was found impossible satisfactorily to explore the heap without removing the whole of the stones. The cairn probably marks the position of the sepulchral cave which was discovered below at a distance of 141 ft. The site of this cave was marked by a fox earth, which completely covered the entrance. On cutting into it, the broad opening of the cave was revealed, filled with three distinct deposits. On the rocky floor of the interior of the cave was a stiff yellow clay, from one to two feet thick, belonging to the glacial period, and without any fossil remains. Above this was a layer of grey clay—2 ft.—containing the remains of the cave hyæna, bison, stag, reindeer, roe deer, horse, and woolly rhinoceros. Above this, extruding to the roof of the cavern, was a prehistoric accumulation about 6 ft. thick, containing bones of the domestic animals used for food by man, proved by the associated pottery to belong to the Bronze Age. It was largely a refuse heap accumulated during the time it was occupied by man. As this was worked away towards the inside a large number of bones were met with underneath slabs of stone, and when these were removed a wall became visible, built of rubble stone, about 4 ft. high and 4 ft. long. This proved to be one of three walls of a sepulchral chamber, the fourth being formed by the inner wall of the cave. Inside were the remains of upwards of thirteen skeletons of various ages, which had been buried in successive times in a contracted posture. Associated with them were fragments of pottery of the Bronze Age, two links of jet or kimmeridge coal, and a carefully ground flint flake, looking almost like the blade of an ivory paper knife. The examination of the skulls proved that the predominant type was that of the long oval-headed inhabitants of the district in the Neolithic Age, while two were round heads belonging to the later Goidelic conquerors of Britain in the Bronze Age. One of these was a female skull. This association of the two races in one family vault affords clear proof that at this time the fusion of peoples had begun, which has been going on ever since, a fusion in the course of which the Iberic tongue gradually became obliterated. In later times the arrival of the Brythonic peoples caused in its turn Gaelic to yield place to the Welsh tongue, and to be represented mainly by isolated names of places and rivers.

Professor Dawkins thought it very probable that the cairn was made to mark the site of the family sepulchre.—Mr. E. W. Brabrook read a paper on "Mediæval Lavatories," illustrating his subject with a drawing of the twelfth century example at Christ Church, Canterbury. He gave a list of remaining examples, chiefly monastic, divided into two classes—those with circular or octagonal plan, and those with rectangular plan. Of these the first class contained all the earlier examples. Referring to the lavatories at Canterbury and at Mellifont, visited in 1900 by the Institute, he noted the persistency of the opinion held by a former generation of antiquaries, that these buildings were baptistries; at Canterbury the authorities went so far as to place a font in the upper chamber there, by way of restoring the building to its original use. The description of the great lavatory at Durham, from the "Rites of Durham," gave an excellent idea of the magnificence of these structures in the larger monastic houses. Of the second class with rectangular plan, a very fine specimen existed at Gloucester in the north wall of the cloister, complete except for the lead linings of the water-trough. This form was the usual one for domestic lavatories, which were sometimes very large, as in the case of one of which it is recorded that a hundred knights and ladies could wash there at the same time.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The concluding meeting of the session was held on the 5th inst., Mr. Blashill, Vice-President, presiding, Mr. E. W. Fry, of Dover, sent photographs of the Romano-British pottery recently discovered at Walmer and a plan of the site, with some interesting notes. Among the exhibits were two antique candlesticks of iron of peculiar construction, probably of Dutch origin, shown by Dr. Winstone, who also exhibited some leaf-shaped and some barbed arrow-heads with modern mounts. Dr. W. de Gray Birch read a paper on "Some Aspects of the Life and Times of King Alfred the Great," in which he pointed out that the celebration of the millenary of Alfred would have been one of the more prominent events of the year had it not been for other imperial causes which had acted adversely in this respect. As it was, however, London by a special exhibition in the British Museum, and Winchester by a special congress, were preparing to honour Alfred's name and fame, and thus the two cities with which Alfred was very closely connected would be doing something to remind us of his time. Dr. Birch recapitulated, at some length and in well-chosen words, the familiar story of the King's life, his youthful years, his afflictions, his predilections, his wars, and his occupations, brushing away, as he did so, many apocryphal stories that have grown up round the hero, and devoted considerable time to a critical exposition of the archaeology of the "Alfred Jewel" and other cognate relics of the Anglo-Saxon goldsmiths' and enamellers' arts, and to a description of the numerous literary works on which Alfred occupied himself.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—A visit was made by the members and associates of this Society on the 12th inst. to the air-compressing station for the Shone system of sewage ejection at the Sewage disposal works, Erith, Kent, and the engineering works of Messrs. Fraser & Chalmers, which are also situated at Erith. The party first visited the air-compressing station of the Erith sewage disposal works, where there are four gas-engine air-compressors, two sets in duplicate. All four engines have automatic arrangements for throwing the air-cylinders out of work when the working pressure in the receiver is reached. The Shone ejector system has been fully described in our columns on former occasions. The party subsequently visited the works of Messrs. Fraser & Chalmers, which have been in operation for about ten years, and are well equipped with modern tools and appliances. The manufactures carried on are gold and silver mining machinery, hoisting and pumping engines. Riedler patent mechanically controlled valves are used for pumps and air compressors. In the machine and fitting shop is a pit 80 ft. long by 20 ft. wide and 8 ft. deep, covered with a removable floor, so that in erecting vertical engines there is a vertical height under the crane of 45 ft. The works are connected by rail with the South-Eastern

railway, and cars can be loaded direct from the machine shop cranes.

THE INSTITUTION OF JUNIOR ENGINEERS.—On Saturday afternoon, June 8, a large party of the members were, by the courtesy of the engineers, Sir John Wolfe Barry and Mr. C. A. Brereton, enabled to inspect the Kew Bridge works. They were shown over by the resident engineer, Mr. R. W. Dana, and on behalf of the contractor by his son, Mr. Alexander Gibb. The work of reconstructing Kew Bridge consists of three distinct parts.—1. Construction of a temporary bridge; 2. Removal of the old bridge; 3. Construction of the new bridge. The temporary bridge was begun in March, 1899, and was opened for traffic on October 12 of the same year. It consists of an 18 ft. roadway, with two 5-ft. footways carried on timber trestles and piles, and is about 300 yards in length. For the river traffic three openings are provided, a central one of 75 ft., a northern one of 40 ft., and a southern one of 50-ft. clear span, the roadway being carried across these by trough flooring resting on plate girders, from which the footpaths are bracketed out. The roadway is wood paved throughout. The removal of the old seven-arched bridge was begun directly the temporary bridge had been thrown open to traffic. The parapets, roadway, and filling above the arches were first removed, then centres were successively placed under the arches and the latter were removed course by course. The old pier foundations, which have given some trouble to get out, are laid on timber platforms sunk from 3 ft. to 10 ft. below low water line. The old bridge is now all removed, with the exception of the foundations of the two central piers and a portion of the approach viaduct and piers. The new bridge consists of three elliptical spans, a central one of 133 ft. and two side spans of 116 ft. 6 in. each, with a central roadway of 20 ft. above T.H.W. The width between parapets is 55 ft., or more than double that of the old bridge, and the gradient of the approaches is 1 in 40. The arches are of granite throughout, and in the piers and abutments the granite is backed with brindle brickwork in cement. Over the piers there are to be four shields, carved in granite, bearing the arms of Middlesex and Surrey respectively. The outline of the voussoirs is brought into relief by heavy rock facing with rusticated joints. Both pier and abutment foundations were put in by means of whole timber (single row) sheet piling cofferdams, tongued and grooved, and driven 5 ft. below the finished foundation level, which for the piers is 16 ft. below the bed of the river or 14 ft. into the London clay. A month ago the north abutment had been built up to springing level, and three courses of arching had been laid before the centering ribs, which are to carry the arching during construction, are erected. The north pier is built up to springing level; the south pier foundation is excavated, and the concrete is being put in; and the south abutment cofferdam is being driven preparatory to excavating. The granite is obtained from Cornwall and Scotland, that from the latter being exclusively used for the parapets and finer work. The bridge is expected to be completed in the course of next year (1902). The contractor is Mr. Easton Gibb, of Aberdeen.

ARCHITECTURE AT THE ROYAL ACADEMY.—By a mistake, in our last issue we attributed the design for the memorial to the Duke of Westminster (No. 1,552 in the Royal Academy) to Mr. A. C. Blomfield; it is by his brother, Mr. C. J. Blomfield.

CATHOLIC CHURCH, NEWTOWN, HUNTINGDON.—A Catholic church, to be known as St. Michael's, has been erected at Newtown, Huntingdon. It is from designs by Mr. S. Croote, of Brampton, the building work being in the hands of Mr. M. Allen of the same village. The stone carving has been accomplished by Mr. Baxter. The building is in the Romanesque style. The main entrance is facing the road, by way of a porch. In plan the building is cruciform, the sanctuary being apsidal, the arms of the cross being formed by the Lady chapel and a small sacristy. By a convenient extension the latter can be entered under cover from the priest's residence. Adjoining the sacristy is the confessional. The small gallery over the porch provides accommodation for the organ and choir. Ancaster stone is used in the interior of the building, and the quoins and dressings outside are of Weldon stone, while the structure is covered with Broseley tiles. The aisle, sanctuary and Lady chapel are paved with encaustic tiles, but under the seats the flooring is of wood. The steps to the sanctuary are of the hard grey York stone. A low-pressure hot-water apparatus warms the building.

TRADE CATALOGUES.

THE Simplex Steel Conduit Company, Limited, of Coventry-street, Birmingham, have sent us an illustrated price-list of their steel conduits and fittings for installing the electric light in buildings. The conduit system of wiring has many points in its favour, and is being extensively adopted all over the country. We notice that there has been a reduction in the prices of the smaller sizes of fittings, and many improved forms of accessories are described. They have also sent us a small book on "Conduit Wiring and Erection," by Mr. Waterhouse, which contains a clear description of the method of installing the "Simplex" system of steel conduits. This book is a thoroughly practical one, containing many valuable hints on points connected with electric wiring which it would be difficult to find described elsewhere. We would mention specially the diagrams given for "looping in" and "looping back," and the description of the methods of getting the conduits round obstructions like cornices, iron girders or beams.

The General Electric Company, of Queen Victoria-street, have sent us their illustrated catalogue of electric fire-alarms. They seem to have worked out a very efficient system of fire-brigade calls, which can be seen in operation at Walthamstow and Tottenham. The alarm-pull is so constructed that when it is pulled out the handle is locked, and a bell rings, showing that the signal has been received at the station. This is also a great assistance in the detection of false alarms. When the signal is received at the station the attendant puts the plug in the hole underneath the fallen shutter on the switchboard, and listens to the telephone. If it is a real alarm he will hear the bell ringing in the post, but if it is merely a short circuit of the wires no sound will be heard, and hence the brigade will not be called out unnecessarily. In addition, the General Electric Company provide a most ingenious pocket telephone containing a combined transmitter and receiver with a telescopic action, which can be readily attached to the fire-alarm pillar, so that communication can be made by a fireman with headquarters directly, and further help summoned or countermanded. This pocket telephone will also be of the greatest use to inspectors, who will be able to make periodic rounds and test all the street posts without any risk of calling out the brigade.

—We have also received from the General Electric Company a catalogue describing their "Gecko" telephones. We think that this telephone will prove a great boon to householders. The use of telephones for private inter-communication is far too much neglected in this country. Probably this is due to the mistaken notion that the National Telephone Company hold a monopoly for the erection of telephones. The telephones illustrated in this catalogue are low-priced, and the cheap bell-push telephone which can be added to any system of electric bells ought to popularise telephony for household purposes. Both on the Continent and in America private telephones are used, and we might almost say universally, and it seems a pity that such a great convenience should not be more widely used in this country.

—They have also sent us their catalogue of "Freezor" electric fans and small-power motors for continuous and alternating currents. The desk and table fans only take the same current as an 8 c.p. lamp, and by a simple regulating switch they can be made to run at three different speeds. The small bracket-fans being provided with lugs for screwing on the wall, can easily be placed in the most advantageous places for dealing with vitiated air. The "Freezor" slow-speed ceiling-fans are very similar to a type of fan that is very extensively used in America. In India, where electric power is available, ceiling-fans have entirely superseded hand-driven punkahs. From a sanitary point of view there is no doubt that they are very desirable. "The Edison" electric-motor fan is a small cheap combined fan and motor, which works very well with a primary battery. The catalogue also contains descriptions of electric blowers for smiths' fires, brazing forges, forcing the draught of boilers, and for ship and mine use. The motors can be made for either direct or alternating current supply, but to obtain a slow speed with alternating currents of high frequency is more difficult than with direct currents, and the motors are therefore more costly.

Messrs. Mather & Platt, Limited, of Salford Ironworks, Manchester, send us a copy of the fourth edition of their "Pocket Catalogue and Tables of Useful Information." Part I. of this little book is devoted chiefly to the description and illustration of electrical machines, and there is a good deal of information in tabular form which ought to be of service to architects and engineers. Part II. contains a selection of tables and notes of the kind to be found in most engineering note-books. Some of the matter is clearly original, and the whole of this part appears to be thoroughly up to date. Many of the tables naturally bear upon electrical engineering, but others, especially those relative to the economisation of steam and power transmission, are of general interest.

Messrs. Easton & Co., Limited, of Erith and London, send us a pamphlet descriptive of the "Schmidt system of utilising highly superheated steam." It has been recognised for many years by engineers that the condensation of steam in various parts of an engine must necessarily occasion considerable loss, and the attempt was made long ago to reduce such condensation by the use of superheated steam. Serious difficulties were encountered in connexion with early applications of high superheating, occurring partly in the superheater and partly in the engine. In the case of the engine trouble was found that the tubes were apt to be burnt out rapidly, and in the case of the engine trouble was experienced owing to the construction being unsuitable for high temperatures, and to the difficulty of procuring lubricants capable of withstanding the degree of heat involved. In Mr. Schmidt's system of superheating the difficulties in question have been successfully overcome, and owing to the production of mineral lubricants with a very high flash-point, no difficulty is now experienced in maintaining efficient lubrication. As a matter of fact, some hundreds of engines are in operation on the Schmidt system with steam at the high temperature of 600 deg. Fahr. in the cylinders, and without undue wear and tear of the working parts. A full account of the system is given in the book, to which we refer our readers for further particulars. In it will also be found some interesting records of investigations by Professor Ewing, F.R.S., of Cambridge University, and Professor Lewicki, of Dresden, and some reports by Mr. Bryan Donkin, of London. The Schmidt system has hitherto been chiefly employed on the Continent, but it is now to be exploited in the British Empire by the company that has acquired the works and business carried on for many years by Messrs. Easton, Anderson, & Goolden, at the Erith Ironworks, Kent.

The Steel Armoured Insulating Conduit and Accessories Company, of 63, Queen Victoria-street, have sent us their illustrated catalogue of conduits for electric wiring. They state that the cost of their system is only 5 per cent. more than that of the ordinary total expenditure for a complete electric installation. As shown from the full instructions given in this catalogue, the piping can be installed by any ordinary plumber who has the assistance of a wireman to indicate the size of the conduits required. Its erection is carried out in the same way as the pipes for gas and water; the best time for putting them in is before any plastering has been done. The wires and porcelain connexion fittings are put in when the main building operations are completed, but before the final decorations are finished. For high-class wiring we think that this system is very desirable.

Husson's Safety Acetylene Syndicate sends us a catalogue of generators, purifiers, and fittings for acetylene lighting installations. The generator made by this syndicate is one of the non-automatic description, and is used in connexion with a gasholder large enough to contain all the gas made from a charge of carbide. Non-automatic generators are, in our opinion, decidedly preferable to the automatic class, although the comparatively large gasholder required for the former adds considerably to the initial cost of the installation. The gasholder should always be of sufficient capacity to contain more gas than will be consumed during any one evening. The prices for large gasholders vary from 130*l.* for one of 500 cubic feet capacity to 310*l.* for one of 2,000 cubic feet capacity. The price quoted for carbide is 2*s.* to 2*s.* 7*d.* per cwt. A list of prices is given for installations of various sizes, the price of a generator, gasholder, and purifier to supply for eight hours twenty 12-candle power flames,

each consuming $\frac{1}{4}$ cubic foot of gas per hour, being 3*s.* The prices quoted for the installations do not include prices for the pipe connexions between the generator, purifier, and gasholder.

Messrs. Homan & Rodgers, of Gracechurch-street, London, send us a copy of "Standards and Tables of Constructional Steelwork," compiled by Ernest Homan and Leopold Mensch. This work, in pocket-book form, is an excellent production, giving sections of and particulars relative to girders, joists, stanchions, and columns, as well as full information as to the bases adopted for all the calculations involved. We are pleased to observe that due prominence is given to the important questions of deflection in girders, and the effects of eccentric loading in connexion with stanchions and columns. The book is one of the few similar works published in this country which contain such details as every architect ought to possess relative to constructional steel.

Mr. William Key sends us a pamphlet containing a description and recommendation of his system of mechanical ventilation on the Plenum principle. While we agree with much that he says, and especially as to the inefficiency of what is called "natural ventilation," he does not benefit his case by decrying every other system. There are cases in which extract ventilation is better than plenum. It is absurd, also, to try to persuade people that mechanical ventilation is cheaper than any other.

Mr. W. Duncan Tucker sends us an illustrated catalogue of his horticultural buildings, conservatories, winter gardens, ferneries, &c. The illustrations for the most part represent buildings actually erected. The catalogue includes also plant frames, boilers, and hot-water pipes and connexions.

Mr. E. G. Herbert, Cornbrook Park Works, Manchester, sends a sheet containing description and illustrations of his "Eccentric Sawing Machine," "Girder Saw," and "Vertical Sawing Machine." In all these a special principle is acted on, to the effect that "few teeth in action make fast cutting," because in cutting a wide section the weight of the saw is distributed over so many teeth that they tend to slip over the work without cutting. This is, in fact, only common sense, though Mr. Herbert may be right in saying that it is often not acted on. In describing the "Eccentric" sawing machine he says:—

"The guides of the saw frame are mounted on an eccentric on the main shaft, the eccentric being so geared as to make a portion of a revolution after every twenty strokes of the saw. The effect is to periodically change the inclination of the saw, causing it to constantly cut on a 'corner' instead of bearing on the whole width of the work. This greatly increases the cutting speed, and permits of the use of a thin fast cutting blade under a light weight, with consequent freedom from buckling."

Messrs. Craker & Dunmore (Harrow) send a leaflet describing their "Harrovian" water waste preventor. Forender it intelligible they should have appended a larger and clearer diagram. The following is their own description of its working:—

"The operation of the apparatus is as follows:—When the float is down the valve is open and water flows freely into the upper cistern, and when nearly full overflows by the pipe and charges the lower cistern to such a level that the float rises sufficiently to close the valve, whereupon the supply of water ceases.

But after the valve is closed there remains temporarily in top cistern a quantity of water which passes through the after flush-hole arranged in pipe and descends into the lower cistern, filling it to a higher level, therefore giving the float greater buoyant force, so that it keeps the valve closed when the pressure in the service-pipe is considerably raised."

Messrs. E. & F. N. Spon send a catalogue of books published by them in connexion with architectural and building subjects.

Mr. C. D. Phillips sends us a catalogue of the productions of the Emlyn works at Newport (Mon.), including portable and semi-portable engines, and some specially designed mortar-mills, intended to resist the hard wear from efficiently grinding such materials as old bricks, clinkers, ashes, &c. There is also the Emlyn mortar mill, in which the mill is combined with engine and boiler, for economy of space and convenience in moving it from one situation to another. The catalogue also includes the "Acme" stone-breaker and brick-breaker, travelling cranes, crab-winch, &c.

Messrs. Moffatt & Eastmead, Limited, send us some sheets illustrative of their hydraulic

and electric lifts of different types. Attention is specially directed to the patent safety self-sustaining lifts of this firm, in which the hoisting machine is fitted with a self-sustaining shaft in place of the usual worm gear, and has an automatic mechanical stop action to prevent over-winding. Moffatt's feed-water heater for steam boilers forms the subject-matter of another sheet issued by the same firm.

The Otis Elevator Company send us a small pamphlet briefly describing the main features of the principal forms of their lifts. In addition to the usual safeguards against various forms of accident, the Otis Elevators are fitted with a speed-governor limiting the speed of the car to the velocity for which the governor has been set, and the action of this device is quite independent of the ropes. In case these should break, the governor would bring into action the safety apparatus attached to the lift cage. An Otis speciality is a very neat type of electric lift for private houses. This lift is operated by push-buttons at the landing doors and in the car. The car stops automatically at the landing corresponding with the button pressed, and the door cannot be opened until it at landing has been reached, while the car cannot be removed until the door has again been closed.

Messrs. Pilkington Bros. (St. Helens) send us a pamphlet containing a description of their wired rolled glass, which has before been referred to in our columns, and a description of the result of a test of its fire-resisting qualities, apparently made at their own works. A reprint of a test by an independent authority would, however, have been more to the purpose.

Mr. John Jones (Chelsea) sends a new descriptive catalogue of his drain testing and cleaning appliances, to the excellent character of which we have borne testimony on former occasions. Among articles under the head of sewage-cleaning apparatus are some which we believe we have not before mentioned: the double sewage scraper, with a backward and forward action, for penetrating the collected sludge and then drawing it back; and the "crow's toe" or grappling hook, with a wheel for running along the invert of the sewer, and which is for use in searching for lools or in dragging sewers. Mr. Jones sends also a sheet of small illustrations of sanitary specialities.

Messrs. J. Sagar & Co. send a list (not illustrated) of their woodworking machinery. They are quite right in their suggestion that the lowest-priced machine is not necessarily the cheapest.

The British Uraltite Company send a sheet of particulars as to the fireproof and non-conducting material which they have named Uraltite, and which is composed of asbestos fibre and mineral substances only. We have already mentioned it with approval in connexion with the exhibit at the Building Trades' Exhibition.

Messrs. Joseph Sandell & Co. send us an illustrated catalogue of their doors, balusters, closet-fittings, &c., and full-size sections of skirtings, handrails, and other mouldings.

Messrs. Mason (Manchester) send a prospectus and illustration of their "Runwell" patent lavatory, which has a siphonic discharge instead of the usual waste and overflow, the action of which operates in cleansing the waste outlet and keeping it clear, and does away with the brass plug and washer, &c. When not in action the siphon bell forms a trap with a 2-in. seal.

The B. & S. Folding Gate Company send us an illustrated catalogue of the steel rolling doors, shutters, and partitions made by the Kinnear Manufacturing Company, of Columbus, Ohio (for whom we presume the Folding Gate Company are the British agents). The steel shutters seem to be made of a great size, one illustration showing a single shutter covering an opening 35 ft. 6 in. wide by 20 ft. high. An illustration is shown of the interior of the Art Institute at Chicago, the internal openings in which are fitted with Kinnear steel rolling doors, thus isolating any room at pleasure, and without any difficulty. Attention is also drawn to the building on the Knox estate, at St. Louis, which is furnished with twenty-six Kinnear steel rolling shutters which close automatically in case of fire. Then there are external shutters shown in another illustration, which are always open except in case of fire, when they close automatically at 150 deg. of heat. But can they be depended on to act in this way after a long period of inaction? That is the important

question. The catalogue includes directions for erecting the Kinnear doors and shutters. We are certainly disposed to believe in their high protective qualities, with the above reservation in regard to the limit of endurance.

Mr. John P. White sends us an illustrated catalogue of garden furniture of the excellent and artistic quality for which his firm is now famous. This includes designs for trellis-work, doveots, sundials, seats, &c., all designed in a good and sensible style, and illustrated in artistic drawings.

BOOKS RECEIVED.

- EARLY DEFENSIVE EARTHWORKS.—By J. Chalkley Gould. (The Bedford Press.)
- THE ART AND CRAFT OF GARDEN MAKING. By Thos. H. Mawson. Second edition, revised and enlarged. (B. T. Batsford.)
- SOME ARCHITECTURAL WORKS OF INIGO JONES. By H. Inigo Triggs and Henry Tanner, jun. (B. T. Batsford.)
- THE BENEDICTINE ABBEY OF SS. MARY, PETER, AND PAUL, PERSHORE. By Francis B. Andrews, F.R.I.B.A. (Midland Educational Company, Birmingham.)

Correspondence.

To the Editor of THE BUILDER.

GLASGOW ROYAL INFIRMARY COMPETITION.

SIR,—The enclosed cutting may, I think, find a place in your journal. Dr. Anderson's straightforward protest is a fine example to some of our weak-kneed assessors.

But it is only just to the committee to say that their action has been consistent, for from the first they have declined any obligation to accept their assessor's award. It was owing to their refusal to give any satisfactory undertaking on this point that I felt myself unable to accept their invitation to compete.

Is it not remarkable how business men (in this case gentlemen of the highest ability) who would never in the management of their own affairs slight the well-considered opinion of their trusted advisers, whether in medicine, law, or art, will yet as a committee take the grave responsibility of rejecting the expert advice themselves have sought?

Cheerfully dismissing doubt, they will attack problems requiring for their solution the nicest consideration by men who, with an ability not less than their own, have spent their lives in studying them. Yet, were conditions reversed, they would deem it folly to entrust the decision of technical matters affecting their manufactures or finance to the judgment of an amateur committee were its members never so brilliant.

I have the greatest admiration for the work of the distinguished architect selected by the Committee, and he has my heartiest congratulations on his success. Nevertheless, it is not for the ultimate good, or of himself, or of the brethren, that matters should have so fallen out. If the result of all the care and anxious thought bestowed by an assessor of Dr. Anderson's attainments and standing be naught, how hardly shall the younger man obtain respect? A new reading is given to the old appeal "Quis custodiet ipsos custodes!"

JOHN W. SIMPSON, F.R.I.B.A.

* * The following is Dr. Rowand Anderson's published protest, referred to in Mr. Simpson's letter. Dr. Anderson's letter appeared in a Glasgow daily paper:—

"ROYAL INFIRMARY RECONSTRUCTION.

SIR,—In consequence of absence from home, I have only now seen the statement formulated and published by the Executive Committee detailing and justifying the steps they have taken and the course pursued by them in dealing with the plans. As my name has been introduced into this statement, I beg you will allow me a few words of explanation.

The committee, in referring to me, say that my function, as I frankly acknowledge, was to 'guide and not to select.' Sir David Richmond stated publicly that I was engaged as 'Technical Adviser, not Assessor.' My appointment, as stated in the minutes, is in the following terms:—'The Sub-Committee thereupon agreed to appoint and hereby appoint Dr. Anderson as Assessor to the Committee.' In the printed terms and conditions of competition issued to architects it is stated that the Committee 'will appoint a neutral architect of standing as assessor, and will give the fullest consideration to his advice.'

The Committee then proceeded to say that one of the two plans which most nearly conformed to the sketch plans issued for the guidance of competitors was not included by me in the short list, and 'that further interviews with me satisfied them that its exclusion arose from no failure on the part of the selected plans in regard to vital or essential particulars, but chiefly from a difference of opinion in regard to the style of architecture and the general elevation, matters on which the Executive Committee ventured to think they were quite entitled to follow their own opinion, and the minority cordially acquiesced in the selection of the majority.'

From the above statement it appears that the Executive Committee considered themselves quite competent to judge not only of the technicalities of the building as an infirmary, but also of its architecture; that being so, one naturally asks why they called in an Assessor.

In proof of their competency to judge and decide on all matters connected with the building, they state that 'the minority cordially acquiesced in the selection of the majority'—which majority consisted of one. This majority would have been converted into a minority but for most unfair canvassing of the committee before I gave my final explanation.

Had I known of this in time I would have thrown up my commission.

It is entirely wrong to lead the public to believe that it was solely on account of the architectural treatment of the design they selected that I did not include it in the short list. I gave the most minute and searching examination to every plan submitted in the competition, and in arriving at a decision I attached supreme importance to those qualities which constituted, according to my view, a scientific building, and one adapted to its purpose, and I maintain that the one I placed first embodies a greater number of merits than any of the others.

The committee believe that they have shown discretion in approving the architectural style of the adopted plan, and they say it is distinctly Scottish—the natural art of the fifteenth and sixteenth centuries, of which we have examples in Heriot's Hospital, Holyrood, Linlithgow, and Falkland Palaces, and in our own old College lately in the High-street. 'It is, therefore, not only appropriate to the historical associations of the site upon which stood the castellated Bishop's Palace, but permitting, as it does, a limited use of Gothic forms, as in Heriot's College, Edinburgh, it is more in harmony with the Cathedral itself than any classic or modern style.'

Rancker architectural nonsense that this was never penned, and whoever composed it is absolutely ignorant of the meaning of the terms he uses. I fail to see what associations there can or should be between a building dedicated solely to the relief of suffering humanity and one erected in a semi-barbarous age, and built with appliances for dealing death and suffering outside and cruelties and torture inside.

If the relief of the sick and the hurt is to be the one paramount object of this building, that can only be accomplished by utilising to the utmost the beneficent and curative forces of Nature and the teachings of science, and not by erecting and wasting money on the glibly absurdity of a Baronial Infirmary.—I am, &c.,

R. ROWAND ANDERSON.

16, Rutland-square, Edinburgh, June 4."

BOARD SCHOOLS, KNOWLE, BRISTOL.—These buildings comprise the large mixed school, which provides accommodation for 500 children, and provision is also made for an extension of classroom accommodation for 100 additional children. The infants' school accommodates 250, with future extension for another 100, and a separate caretaker's house is provided. Owing to the sloping nature of the site a basement has been obtained under a portion of the mixed school, where is placed the technical instruction department, comprising a combined cookery school and laundry, bonnet-room, and model sitting-room and bedroom for the teaching of housewifery subjects. Divided from this portion by a playshed is a manual instruction workshop for the boys. The architect is Mr. H. Dore Bryan, of Bristol. The building has stone walls faced with red Cattybrook brick, with Bath stone dressings. The roofs are covered with red tiles, and the floors generally are of wood blocks on concrete. The playgrounds are asphalted and surrounded by a dwarf wall, with railings and gates of wrought iron. One of the chief features of the scheme is the central hall of the mixed school, 80 ft. by 35 ft. The general contractors were Messrs. R. Wilkins & Sons. The buildings are warmed on the low-pressure hot-water system. The work has been done by Messrs. Crispin & Son. The sanitary arrangements are in separate buildings for the three departments, and the fittings have been executed by Mr. G. F. Tuckey.

WESLEYAN CHURCH, ST. LEONARDS.—A new Wesleyan church is being erected in Norma-road, St. Leonards, to take the place of the church that was demolished by fire on Good Friday in last year. The building has been erected by Mr. W. G. Morgan, of St. Leonards, from plans by Mr. J. Weir, of London, and the total outlay will amount to about 5,500.

Illustrations.

ILLUSTRATIONS OF SCULPTURE AT THE ROYAL ACADEMY.

ALL the examples of sculpture contained in the two plates we publish this week are from works exhibited at the Royal Academy, and all are referred to in the second article in the present issue. Mr. Schenck's "Summer" and "Autumn" are, however, treated as separate illustrations on a larger scale, because they are more especially architectural sculpture, intended for the decoration of a building, and therefore more closely related to the central subject of this journal.

A COUNTRY CHURCH.

This church is proposed to be built in the suburbs of a Yorkshire town. The plan is unique in form, the centre portion between the nave and chancel being a spacious low tower, with open timbered roof filled with tracery, above which is a *flèche* with stained glass windows, shedding a very subdued light amongst the tracered timbers. This *flèche* forms an extract for vitiated air in the winter, aided by eight fresh-air inlets distributed throughout the church.

On the south side a morning chapel is divided from the tower by an arcade and oak screen, and is to contain a large Jacobean monument of the family of the principal donor (who is Lord of the Manor) at the west end. Under the east window a small altar is to be placed.

Between the central tower and the chancel an oak rood screen will be placed, and the choir stalls and pulpit are of oak. The lectern is an old Jacobean desk restored, and is a gift together with stained glass east window for the chancel. Some interesting remains (the property of the donor) of a thirteenth century window, are to be inserted in the chancel in the form of a *sedilia*.

The fresh air during the winter months will be admitted by way of the channels for the heating pipes, in such a manner as will not interfere with the action of the extract in tower roof.

A bell turret, containing one bell, will stand at the south-east corner of the tower. The south porch is of open tracery and open timber roof, the doors into the church being double, a pair hung on the outside of the wall and a pair inside, the single doors opening in the thickness of the wall. The north porch is enclosed.

The walls are proposed to be built of rough coursed rubble and Whitby dressings with occasional six-inch courses of red sandstone. The roofs to the tower and porches would be covered with oak shingles, and the main roofs with stone tiles.

The estimate for the church (excluding all the oak work and the *eredos*) amounts to 5,600*l.*, and there is accommodation for 480 worshippers. This price does not include the small altar and furniture in the chapel.

The drawing was hung in the Royal Academy Exhibition of 1898. E. B. LAMB.

ST. SIMON'S, SALTRAM-CRESCENT, W.

This design was selected in limited competition some time ago, but was not carried out. Below the church the whole of the space was arranged for parochial purposes; the site was irregular and unsuitable. The designs were prepared by Mr. William A. Pite.

PLAN OF THE WALL OF JERUSALEM.

This plan of the wall built around Jerusalem in the sixteenth century—the comparatively "modern" wall—was prepared by Mr. Geo. Jeffery, an English architect who has taken much interest in eastern architectural remains, and who has himself carried out some modern buildings at Jerusalem.

The plan is intended as an accompaniment to and illustration of the first article in the present issue.

ARCHITECTURAL PHOTOGRAPHS.—We have received from Mr. C. R. H. Pickard, photographer, of Leeds, a number of specimens of photographs of architectural subjects, which we can cordially praise. They are especially clear in definition of detail, which is a most important point in architectural photography.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.
22.—JOINTS IN PIPES.

THE plumber has now to deal not only with lead, but also with brass, iron, copper, pottery, and other materials, and must be able to make perfect joints not only between two pieces of the same material, but also between any two different materials. Skilled workmanship is essential in this department of the plumber's duties, as, however good the sanitary fittings in a building may be, the exclusion of foul air will not be ensured unless every joint in the internal waste-pipes, ventilation-pipes, and soil-pipes, is absolutely watertight and airtight. It is often thought that the same care is not necessary in the case of external pipes, such as soil-pipes, but when it is remembered that these generally serve also as ventilation-shafts for the drains, and are therefore conduits for foul air, and that air escaping from defective joints may be drawn into the building through open windows, it must be admitted that even in external pipes the workmanship must be of the best.

Lead to Lead.—The joint which the plumber is most frequently called upon to make is that between two pieces of lead pipe. Two kinds of joint are in common use—the copper-bit joint and the wiped joint. In both cases the two pipes are united by solder, which is a mixture of tin and lead. The proportions vary according to the work in hand. "Plumber's solder" contains about two parts (by weight) of lead to one of tin, and is generally used for wiped joints; "fine solder" is composed of lead and tin in equal quantities, and is used for copper-bit joints and seams and for "tinning" brass-work preparatory to making a wiped joint; "strap solder" is often made of one and a half parts of lead to one of tin, and is used for copper-bit joints. Into the practical details of shaving, tarnishing, &c., we need not enter. It will be sufficient for our purpose to describe the joints in a general way. Copper-bit joints are easily made, and require only a small quantity of solder. They are therefore often used by incompetent workmen, and by the worst sort of speculating builders. The lower of the two pipes has its upper end dressed out to form a tapering socket (fig. 1), and the lower end of the upper pipe is rasped outside and slightly opened to fit closely into the bottom of the socket. A piece of strap solder is then placed in the socket around the upper pipe and melted by the heated copper-bit or by the blow-pipe, so as to flow down to the bottom of the socket and adhere to the surfaces of the two pipes. As tin melts at a very much lower temperature than lead, there is a danger of the tin in the solder running through the joint and solidifying inside the pipe. To prevent this, the end of the inner pipe is sometimes "smudged over." In any case the copper-bit joint is weak and is easily damaged by the weight of the pipes and by their expansion and contraction. It ought never to be used in internal waste-pipes or soil-pipes, and is, indeed, prohibited by some sanitary authorities. The joint is, however, often made between the brass tail-pipes of lavatories, baths or flushing cisterns, and the lead traps and flush-pipes, as in many cases the tail-pipes are too short for wiped joints to be made. It is obvious that joints in these positions are not as important as joints in waste-pipes and soil-pipes.

The "overcast" copper-bit joint is strengthened by a thin flat band of solder, which is not wiped but brought to a smooth surface with the copper-bit. It is sometimes used for making the connexions to short tail-pipes. The copper-bit joint when used for external soil-pipes is often strengthened and ornamented by means of a lead astragal and fillet, as shown at A in fig. 2. Lead tacks B B for supporting the pipe are generally soldered to the back of the pipe immediately below the joint, and a second or dummy astragal, C, is soldered round the pipe close to the bottom of the tacks. A similar appearance is obtained by the use of the cast-lead socket (fig. 3), but this involves the making of two joints, one at each end of the socket. The "century" patent lead socket (fig. 4) is strengthened by tinned perforated copper (24 B. W. G.) bedded in the middle of the lead both in the socket and tacks. This copper core is shown in elevation at A, the dotted lines representing the outline of the tacks; B is a horizontal section to a larger scale; and C a vertical sec-

tion, showing the tacks in elevation with the four nail-holes at *n n n n*. The copper is continued into the recesses at the ends of the socket, so that the solder connects the pipe directly to the copper core, thus ensuring a stronger joint. The sockets are made either with flat backs for pipes fixed on the face of a wall, or with angular backs for pipes fixed in angles, and in sizes as follows:—

Internal Diameter.	Long Sockets.				Short Sockets.			
	Flatback. Width over all.	Angular. Width from angle.	Height.	Flatback. Width over all.	Angular. Width from angle.	Height.	Height.	
in. 1½	in. 2½	in. 4½	in. 5½	in. 6½	in. 4½	in. 6½	in. 2½	
2	7	4½	5½	7½	4½	7½	3½	
2½	7½	5	6½	8½	5	8½	3½	
3	8½	5½	7	9½	5½	9½	4½	
3½	9½	6	7½	10½	6	10½	4½	
4	10½	7	8	11½	7	11½	5½	

Cast gun-metal round-headed nails, 2½ in. long, are supplied for fixing the tacks to the walls; the nails are made with ½ in., 1 in., or 1½ in. heads, left dull or "bright turned." The lead tacks can also be obtained of sufficient width to fold over the heads of the nails.

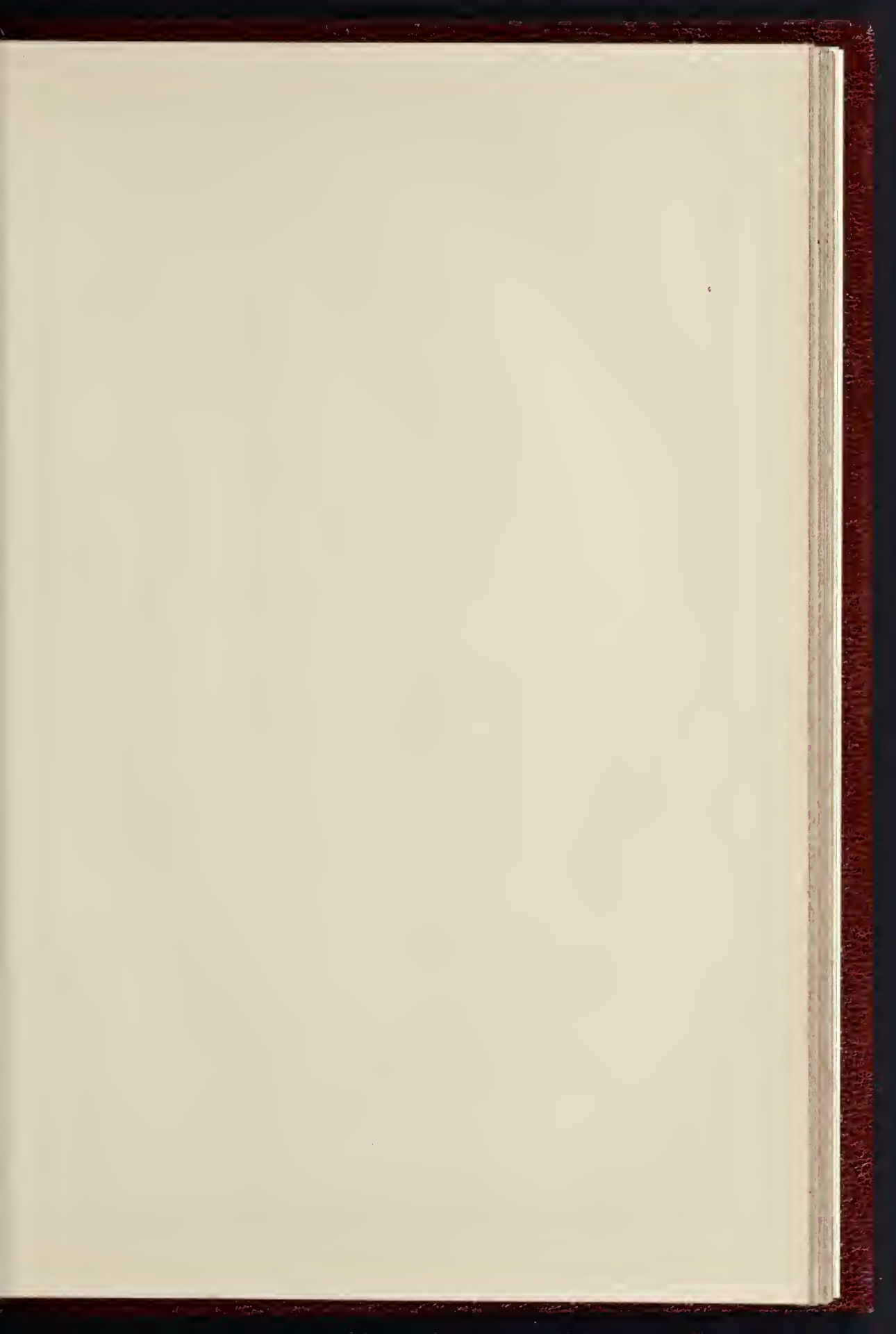
The *wiped joint*, also known as the "plumber's" or "round" joint, is the most generally useful joint for lead pipes. It may be used for connecting two pipes in the same straight line, when it is often known as an "underhand" wiped joint, and also for uniting one pipe to the side of another, when it is known as a "branch" wiped joint. In the underhand joint (fig. 5) the ends of the two pipes are formed in a somewhat similar manner to those in a copper-bit joint, but the whole of the joint is covered with a mass of solder, wiped with a cloth to a round shape. The joint is therefore much stronger than the copper-bit joint, and if properly made is perfectly watertight and airtight. It is undoubtedly the best form of soldered joint for lead waste-pipes and soil-pipes. Fig. 6 shows a wiped branch joint suitable for a soil-pipe. Considerable skill is required to make a perfect wiped joint; notwithstanding the mass of solder weeping often occurs, especially in service-pipes conveying water under great pressure. Some plumbers therefore "overcast" their wiped joints by running the copper-bit over them, as this gives a smoother and closer surface to the solder, but the practice is not looked upon with favour in this country.

The "block" joint (fig. 7) is a soldered joint used for vertical lead soil-pipes fixed in chases. It takes its name from the wood or stone blocks which support the joint. The upper end of the lower pipe is passed through a lead flange, A, resting on the block B, and is then opened out to form a socket, into which the lower end of the upper pipe is fitted. The joint is then completed with the solder C. Two methods of finishing the end of the lower pipe are shown. The upper edges of the blocks ought to be rounded to prevent cracking of the lead. A similar joint is often made in pipes passing through a floor, the floorboards taking the place of the block.

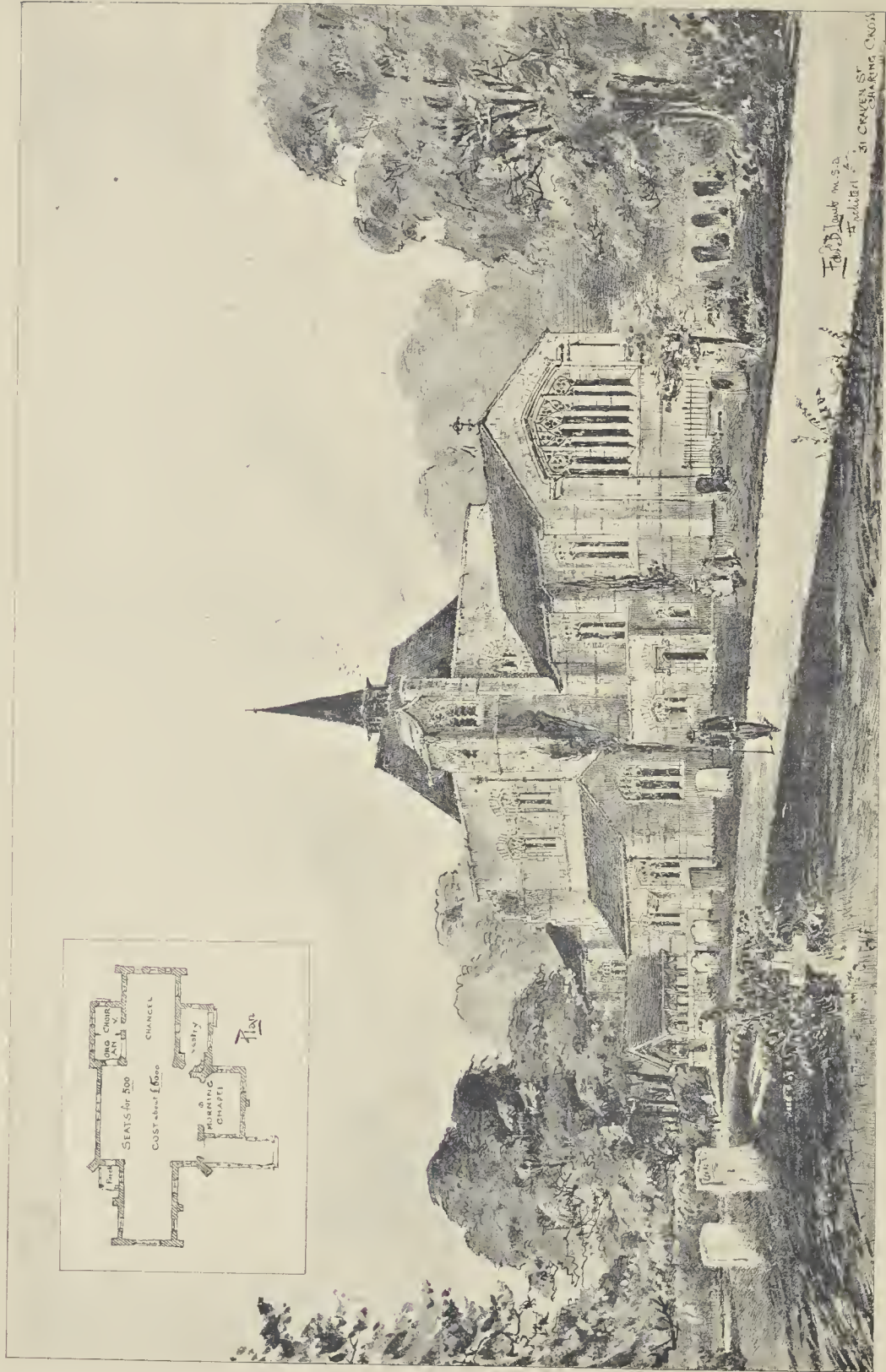
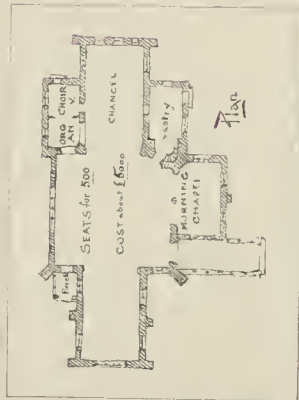
An inferior form of joint is made by taping back the upper end of the lower pipe so as to form a flange. The upper pipe is fitted to this as in fig. 7, and the joint completed with solder. The lead is often seriously weakened in taping it back, and a separate flange is therefore much better.

The "slip" joint is made by slightly opening out a short portion of the lower pipe to form a cylindrical socket into which the upper pipe is slipped, a coat of red and white lead or a little putty being relied upon to make the joint tight. Needless to say, joints of this kind are absolutely unsuitable for sanitary work.

Long lead waste-pipes from fittings discharging hot and cold water, such as sinks and baths, sometimes crack in consequence of the alternate expansion and contraction. To prevent this expansion joints are used. Two simple forms are shown in fig. 8. In that marked A the end of the lower pipe is formed into a socket about 5 in. deep by means of a hardwood mandrel; a vulcanised indiarubber ring is sprung on to the upper pipe close to the end,



THE BUILDER, JUNE 15, 1901

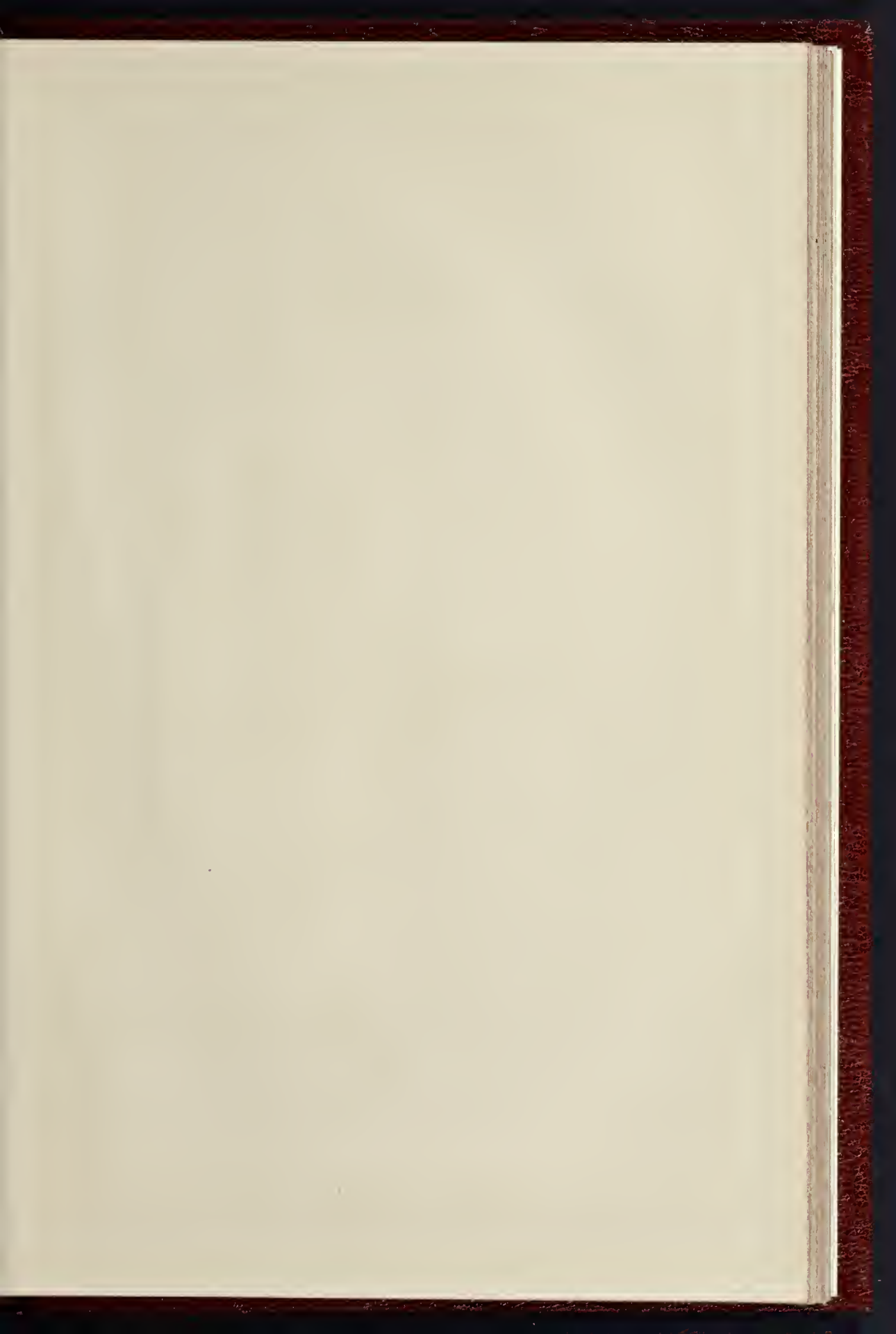


Edw. Lamb, M.A.S.A.
Architect

St. Crispin St.
Sharnburg, Ohio

DESIGN FOR A COUNTRY CHURCH (500 SEATS) — MR. E. B. LAMB, ARCHITECT.

INK-PHOTO SPRAGUE & CO. 4 & 5 EAST HADING STREET, PETER LANE, E.C.





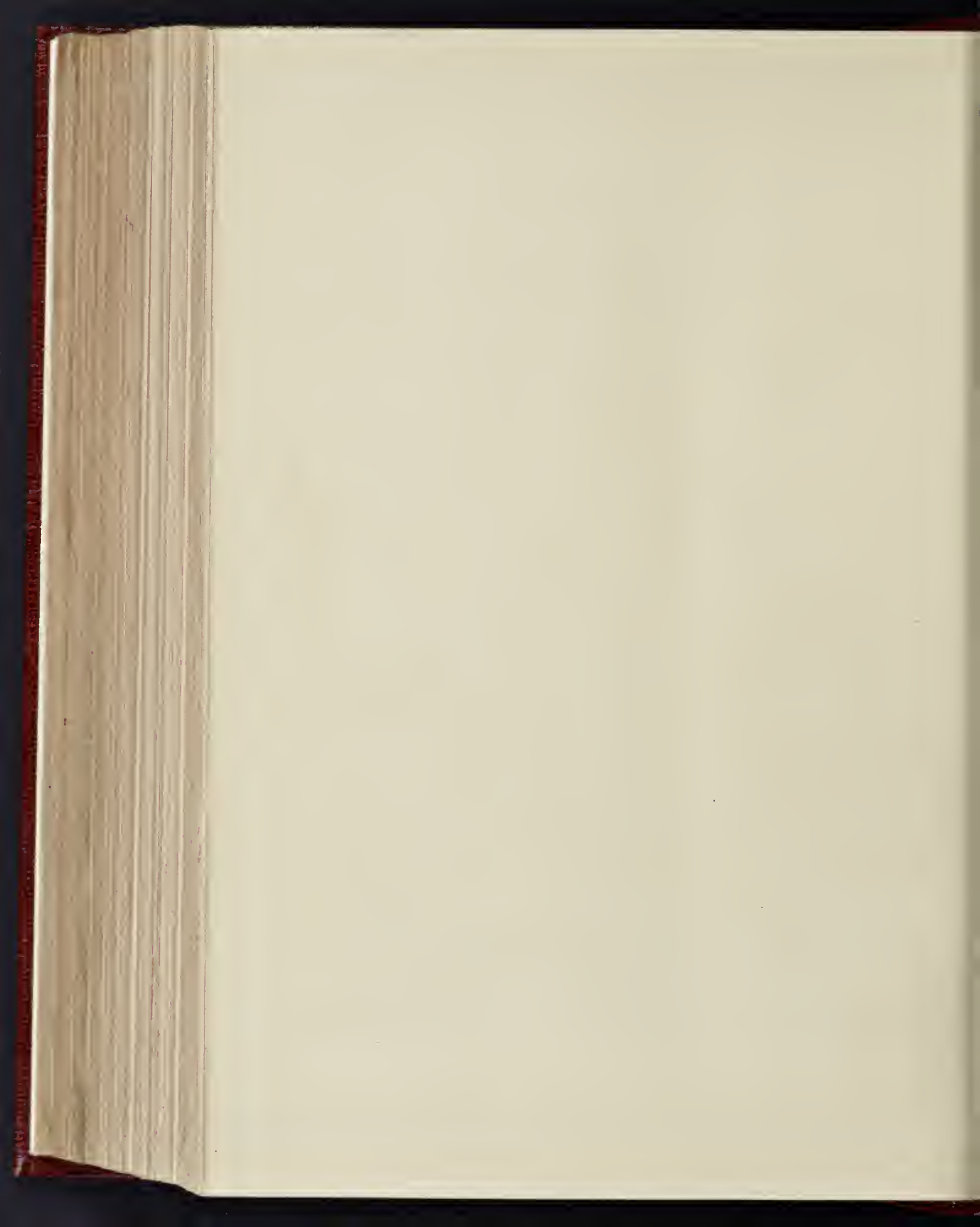
INK-PHOTO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"SUMMER" BAS-RELIEF TO BE EXECUTED IN TERRA COTTA AS A DECORATION TO A BUILDING
MR F. E. E. SCHENCK, SCULPTOR



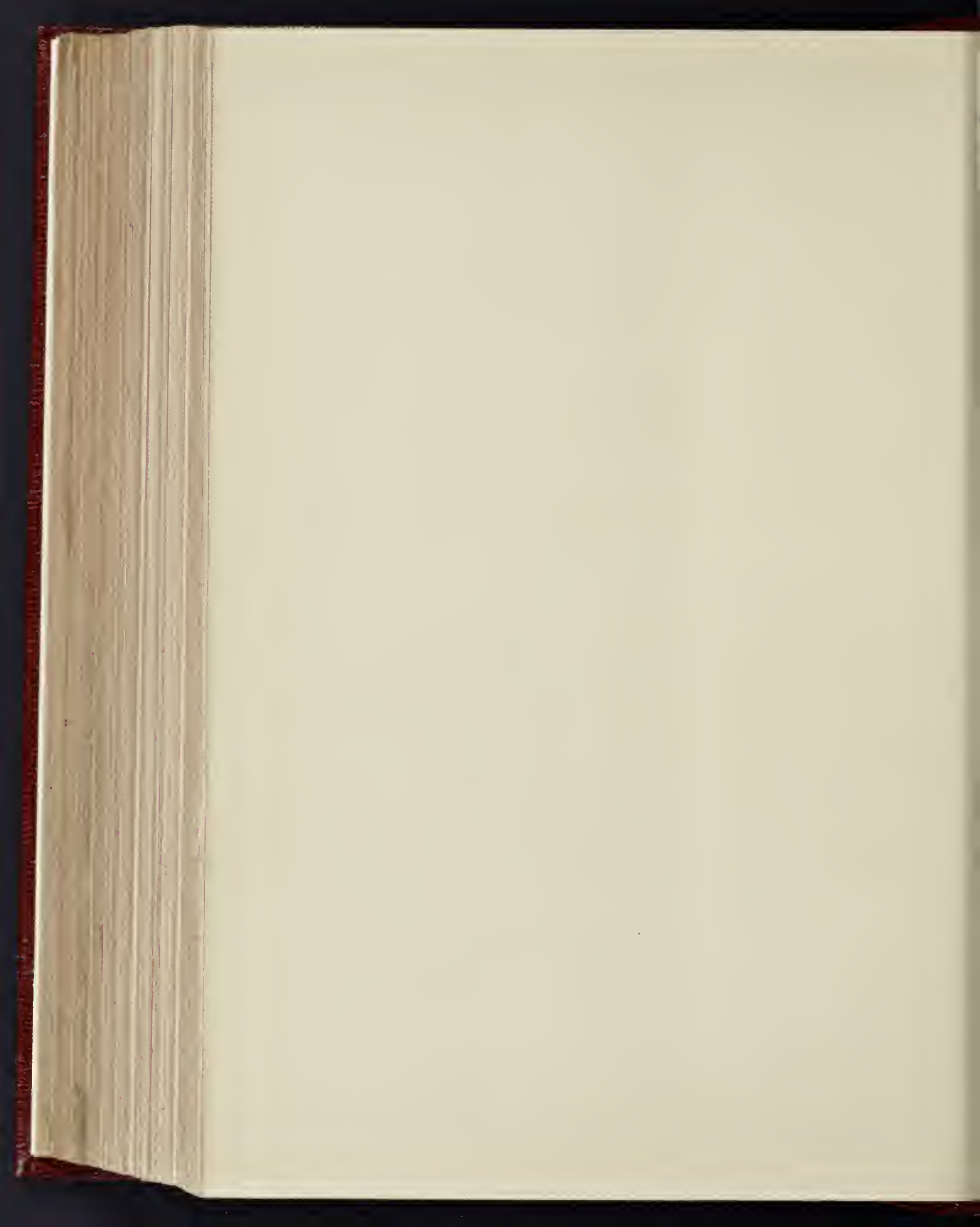
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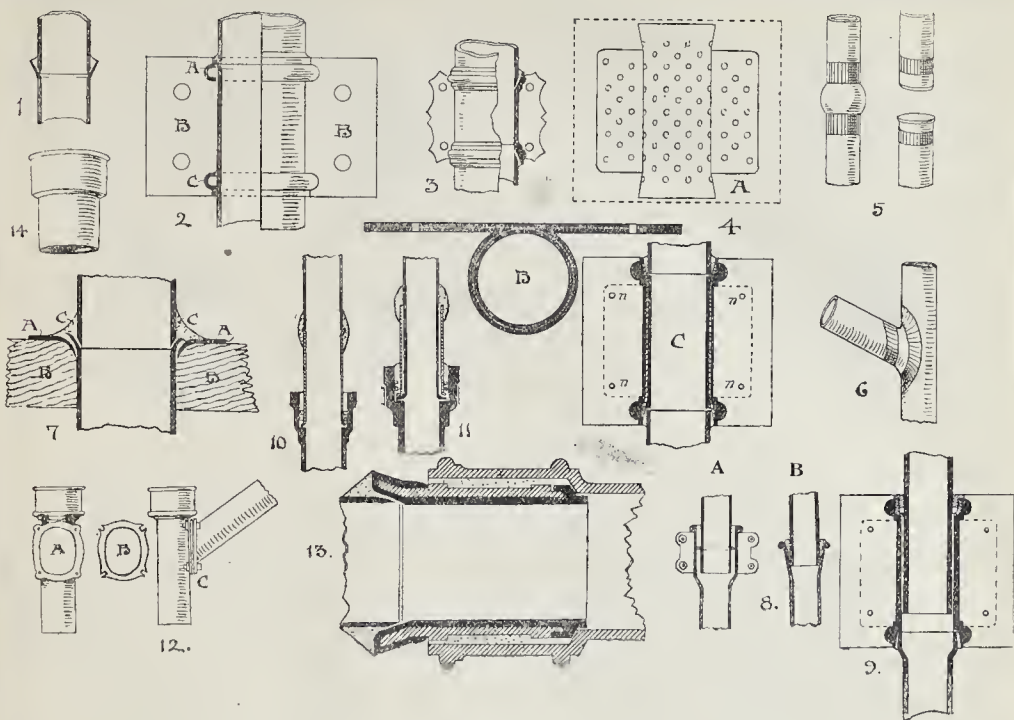
"AUTUMN" BAS-RELIEF TO BE EXECUTED IN TERRA COTTA AS A DECORATION TO A BUILDING
MR F. E. F. SCHENCK, SCULPTOR.





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Illustrations to Student's Column. Chapter 22.

and when this pipe is pushed into the socket the ring closes the annular space between them and is rolled to its final position. In the joint marked B an indiarubber cone with beaded edge is used, and the socket is conical, the upper pipe being slightly tapered to fit. Lead tacks are often soldered to the lower pipe at the joint for the purpose of fixing the pipe to the wall. The expansion joint shown in fig. 9 is formed by means of a lead socket and tacks with copper core like that illustrated in fig. 4, but with a tinned gun-metal screw-gland stuffing box, A, riveted to the copper body and tacks; the socket is made in sizes to receive 1½-in., 2-in., 2½-in., and 3-in. pipes. It is doubtful whether any of these joints will remain permanently tight.

Lead to Brass and Copper.—Joints between lead and brass or copper present no peculiar difficulty. After the end portion of the brass or copper pipe has been "tinned," it can be united to the lead pipe either by a copper bit or a wiped joint.

Lead to Iron.—In uniting lead to iron, a flanged brass or copper thimble or "sleeve" is generally used, as shown in figs. 10 and 11. In fig. 10 the lead pipe is united to the upper end of the thimble by a wiped joint, while in fig. 11 the lead pipe is passed through the top sleeve-piece, the two being united at the top by a wiped joint. This is by far the better arrangement. In both cases the lower end of the brass or copper is placed in the socket of the iron pipe, and the joint completed by running the socket full of molten lead and thoroughly caulking it. A few strands of yarn must be caulked into the bottom of the socket to prevent the lead running through the joint into the iron pipe. The thimbles must be strong enough to resist the strains caused by the caulking tools. Brass thimbles can be obtained in two thicknesses, known as "light" and "medium," and in sizes increasing by ¼ in. from 2 in. to 4 in. Brass sleeves are generally made ¼ in. larger in diameter to allow the lead pipe to pass through. As a rule thimbles and sleeves are of cast brass, but solid-drawn brass ferrules are now made in sizes varying by ¼ in. from 1½ in. to 4½ in. The brass connexions ought to be of sufficient length, so that the wiped joint will be quite clear of the iron socket. Connexions 1½ in., 2¼ in., and 2½ in. in diameter can be obtained from 3½ in. to 6 in.

long, and larger sizes from 4 in. or 4½ in. to 6 in. Heavy cast-brass sleeves for uniting lead to iron soil-pipes (4 in. in diameter) are made 4½-in. bore, 4½ in. over the flange, and 6½ in. long.

Another form of joint (fig. 12), known as Taylor's, is intended for uniting a lead branch to an iron soil-pipe. The iron junction-pipe is cast with an oval flanged opening, A, and a loose iron collar, B, is supplied of the same shape as the flange. The oval opening allows the branch to be made at various angles. The end of the lead branch must be cut to the required bevel, passed through the loose iron collar, and tacked back about three-quarters of an inch all round. The face of the iron flange is then covered with red-lead putty, and the joint is completed as shown at C by tightening the four bolts, the lead flange on the end of the branch being compressed between the iron flange and collar. This joint has been approved by the Sanitary Authorities in Manchester and other towns in the North of England, and has the advantage of being easily disconnected for the purpose of repairing the closet or soil-pipe. The same sizes of junction and collar are used for connecting a lead anti-siphonage pipe to an iron soil-pipe, but in this case a wide flange of sheet-lead must be wiped to the end of the lead pipe.

Robinson's "Enable" caulking thimble (fig. 13) is of iron covered inside with lead, which is also turned over to the outside of the iron at the top and bottom. A soldered joint can be made between the lead pipe and the lead covering of the thimble, and the annular space between the thimble and the socket of the iron pipe can be caulked with lead in the usual way. The thimble is of smaller diameter than the iron pipe to which it is connected.

When the position of the lead and iron pipes is reversed—that is to say, when the flow of water is from the iron to the lead pipe—a different form of joint is required. A brass socket may be used with tinned tail. The spigot end of the iron pipe or trap is placed in the socket, and the joint completed with gasket and neat cement or (better, if the brass is of sufficient strength) with gasket and caulked lead. The tinned tail is united to the lead pipe by means of a wiped joint. Sometimes a flange is cast on the outlet of the iron trap, and a corresponding flange is

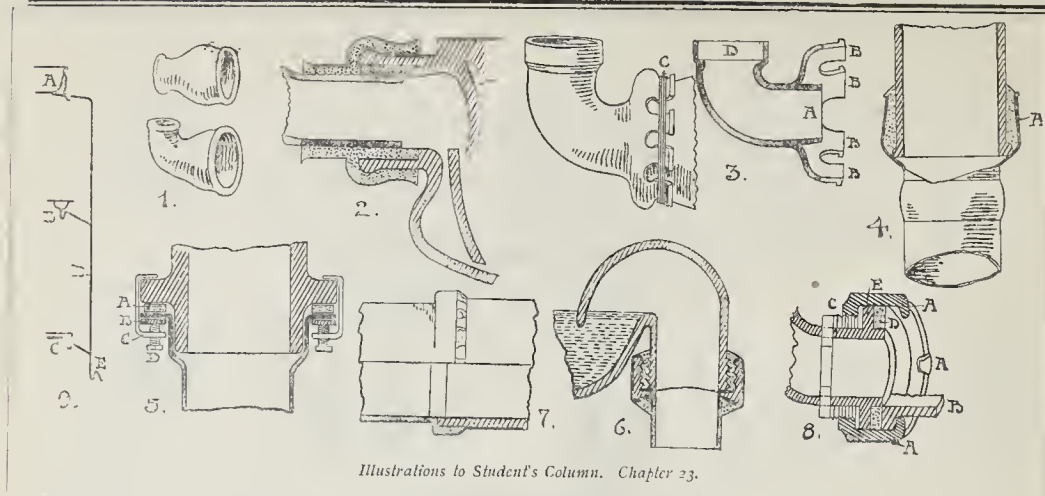
formed on this lead pipe by tacking; the two flanges are then bolted together with an indiarubber washer between. A loose collar of brass or iron is placed outside the lead flange, after the manner shown in fig. 12.

23.—JOINTS IN PIPES (continued).

LEAD TO POTTERY.—For connecting a lead soil-pipe to a stoneware drain, a brass sleeve, similar to those shown in figs. 8 and 9 of the preceding chapter, but with a wider flange for fitting into the stoneware socket, should be wiped to the lead pipe. The joint is completed by running the socket full of neat Portland cement, a few strands of gasket being first inserted to prevent the cement running through into the drain.

For connecting lead flush-pipes to the inlet horns of water-closets, slop-sinks, &c., indiarubber cones are generally used; both straight and elbow cones are made as shown in fig. 1. No paint or putty must be used in contact with the rubber, as these destroy its peculiar properties. Twyford's patent rubber connexion (fig. 2) makes a water-tight joint without having to wrap cord around it, as is often necessary when ordinary cones are used. The objections to the use of india-rubber have led to the introduction of a new form of joint, known as Fullerton's "Full-flush," shown in fig. 3. For lead flush-pipes the connexion is of lead. The spigot A is passed into the socket of the inlet horn of the closet, and the lugs BB are then bent till they come in contact with the outside of the horn; they are kept in position by copper wire wrapped round the horn, as shown at C. Red lead is spread on the contiguous surfaces to make the joint tight. The socket at D is intended for the reception of the flush-pipe, the joint being made with solder or red lead.

When the flow of water is from the pottery to the lead pipe, different forms of joint must be used. Brass washers and unions with tinned linings or tails are generally used for the outlets of pottery sinks, lavatories, and baths, and details of these have been given in the chapters on these fittings. The principal joint remaining to be considered is that between the trap of a water-closet or slop-hopper and the lead branch of a soil-pipe. The joint specified by the London County Council



Illustrations to Student's Column, Chapter 23.

(fig. 4) is made by means of a brass connexion A, into the socket of which the outlet of the trap is fitted, the annular space between the pottery and brass being then filled with neat Portland cement; the tail of the brass connection is tinned, and is united to the lead branch by means of a wiped joint. It is a good plan to have the socket of greater diameter at the bottom than at the top. A patent cast-lead "socket" is now made by Cloughton Bros. to take the place of the brass socket; the socket portion is lined with iron, which is corrugated to offer a firmer attachment for the cement with which the annular space is filled. Sometimes a screw-thread is formed on the pottery outlet, to which a screwed lead socket is attached, but this joint can only be used when the outlet of the closet is specially made for the purpose.

A flanged joint can be made water-tight and air-tight, and has the advantage of allowing the closet to be easily removed in the event of damage being done either to the closet or branch. Flanged joints, however, ought always to be made above (and not at or below) the floor-level, and the screws ought to be tightened periodically. The old method of bringing the lead pipe through a hole in the floor and taping it back to form a flange resting on the boards, and then covering the flange with red lead and screwing the closet through it to the floor, is now generally condemned. Fig. 5 represents a good form of flanged joint. The end of the lead pipe is opened out and tinned back to form a socket and flange; an india-rubber ring A is placed between the lead and pottery flanges, and a brass collar B is fitted under the lead flange to give the necessary rigidity. Three or more brass clips C are placed at intervals around the joint, and the connexion is completed by tightening the set-screws D.

Robinson's "Enable" connexion (fig. 6) consists of an earthenware socket corrugated inside and covered outside with lead. The joint between the socket and lead pipe is made with solder in the usual way, and that between the socket and pottery with neat cement. The socket is $2\frac{1}{2}$ in. deep, and is made in three diameters— $3\frac{1}{4}$ in., $4\frac{1}{2}$ in., and $4\frac{3}{4}$ in.

The pottery outlets of many modern water-closets and slop-hoppers are fitted into lead sockets, so that a wiped joint can be made directly between the latter and the lead branch pipes. The first joint of the kind was Doulton's "Metallo-keramic" joint (fig. 7). The pottery outlet is metalised, so that a lead socket can be united to it by means of a soldered joint; to the tail of this socket the branch pipe can be wiped in the usual way. This and kindred joints have been largely adopted, and are thoroughly satisfactory in the hands of good workmen.

Brass, Copper, &c.—Brass and copper pipes may be united to other pipes of the same materials by screwed ends or by screwed unions, brass and copper pipes to lead by soldered joints, brass and copper to iron by caulked lead joints, as already described, or by screwed joints, and to pottery by cemented joints. A special brass connexion is made for uniting a

brass flush-pipe to the inlet horn of a closet (fig. 8). When the connexion has been placed on the end of the horn, the clips AAA are pressed down over the projecting rim of the horn shown in section at B; the screw C is then tightened and makes a good joint by compressing the rubber ring D between the end of the horn and the brass flange E of the flush-pipe. For further details of connexions between pottery and brass, see the chapters on sinks, lavatories, &c.

Pottery to Pottery.—Joints of this kind occur at the outlets of closets connected directly with the drains. This direct connexion ought never to be made except in outbuildings, as it necessitates the drain being brought inside the building, and as one or more joints must be made below the level of the floor. A few strands of gasket should be gently caulked into the socket, and the socket should then be filled with neat Portland cement. Similar joints may be made in the pottery waste-pipes of laboratory and other sinks.

Iron to Iron.—The most important joints of this kind are those in iron soil-pipes and branches, and are almost invariably socket joints caulked with molten lead. In scamped work putty is sometimes used, but this is certain to lose its plasticity in time, and the joint ceases to be air-tight. A better joint is made by running the socket full of neat Portland cement, after first caulking into it a little yarn or gasket to prevent the cement passing into the pipe. Rust joints are also occasionally used, but the caulked lead joint is the best. A flanged joint is useful when it is required to fix a length of pipe to the top of a stack in such a position that the joint is above the eaves or wall. The flanges are bolted together, red lead or an india-rubber washer being interposed to make the joint tight. Iron sink-traps are sometimes made with screwed outlets for fixing into the screwed sockets of iron waste-pipes. The joint between a cast-iron closet hopper and trap is generally formed by means of flanges bolted together with a rubber washer between.

Iron to other Materials.—Various methods of uniting iron to lead and other metals have already been described. An iron soilpipe may be connected with a stoneware drain by a cemented socket-joint, and a pottery closet outlet may be connected to an iron branch-pipe by a bolted flanged joint with india-rubber washer, or by an iron socket made specially wide to receive the pottery and run with neat cement.

WASTE-PIPES.

The term "waste-pipe" may with advantage be confined to pipes receiving discharges from fittings which are used for personal ablution or for washing crockery, domestic utensils, vegetables, &c., while the term "soil-pipe" may be applied to all pipes receiving discharges from fittings used for the reception of urine and feces. The latter class includes water-closets, slop-hoppers, and urinals. All other fittings will fall into the former class. Certain general rules are applicable to all waste-pipes—that is to say, to all pipes receiving dis-

charges from washing-up sinks, lavatories, and baths.

1. All waste-pipes ought to be disconnected from the drains by being made to discharge over trapped gullies. Whether the end of the pipe may be connected to the side of the drain-trap between the grating and the surface of the water depends to some extent upon circumstances. Some sanitary authorities insist on the point of discharge being not less than 18 in. from the drain-trap; others require it to be immediately over the grating; and others, again, allow the connexion to be made into the side of the trap above the standing water. The first position is the best for the purpose of preventing drain-air passing up the waste-pipe, but unless the channel leading to the trap is protected by a grating, under which the waste-pipe discharges, it is apt to become choked with leaves, &c.

2. Every waste-pipe from a single fitting ought to be provided with a trap, fixed as close to the fitting as possible. In the case of ranges of similar fittings, such as lavatories, a main waste-pipe is often provided with branches to the several fittings, and the main waste only is trapped. The objections to this arrangement will be discussed in the next chapter. As a corollary to this rule, it may be said that waste-pipes must be so arranged that the water from any fitting must not be made to pass through more than one trap on its way to the external gully. Double-trapping is sometimes practised, especially when the waste-pipe is connected directly with the drain, but it is a great mistake. Such an arrangement is shown in fig. 9; the bath A, lavatory B, and sink C are separately trapped and connected to a main waste D, which is trapped at E. When the bath is emptied, the air contained between its trap and the trap at E must escape somewhere, and this will probably be done by forcing the trap of one of the lower fittings; again, the rapid discharge through the trap E will almost inevitably siphon out one or more of the traps above.

3. The traps of all long waste-pipes, and of all waste-pipes receiving discharges from more than one fitting, ought to be ventilated, in order to prevent the water being siphoned out of the traps. If the traps are properly ventilated and the waste-pipes are properly laid and jointed, there can be no objection to connecting two or more fittings to one main waste-pipe. The traps of single fittings with short waste-pipes are often left without anti-siphonage pipes; thus there is little necessity (as far as siphonage is concerned) to ventilate the trap of an ordinary kitchen sink, the waste-pipe of which is, perhaps, less than 3 ft. long. But the more rapid the discharge is from the fitting the more necessity there is for trap ventilation. An old-fashioned lavatory basin with, say, 1-in. plug and $1\frac{1}{2}$ -in. trap and waste-pipe is much less likely to cause siphonic action in the trap than a modern quick-waste lavatory, especially if the latter is fitted with a trap and waste-pipe only $1\frac{1}{4}$ in. in diameter.

4. All long waste-pipes and all waste-pipes receiving the discharges from two or more

fittings ought to be carried up (full-size) as ventilation-pipes, the upper ends to terminate at suitable points above the neighbouring windows and at a sufficient distance from them. This may seem a counsel of perfection, but as waste-pipes often become foul, and unless ventilated contain air more or less impure, it is a good plan to allow a free current of air to pass through them. Waste-pipes from fittings on the upper floors of buildings are sometimes made to discharge over cast-iron rain-water heads, from which cast-iron rain-water pipes lead down to the gully below. The ironheads and pipes are not only quickly corroded, but they are almost certain to be fouled, and the foul air escaping from the head and joints may be drawn into the house through the nearest windows. Even this arrangement is, however, better than a long unventilated waste-pipe fixed inside the building and buried, or half-buried in plaster.

5. Waste-pipes, like soil-pipes, ought to be fixed outside buildings wherever possible. The multiplication of pipes on the outside of a building is undoubtedly in some cases an eyesore, but if the sanitary fittings are grouped together this objection loses much of its force, and it is certainly better, if leaks occur, that they should not contaminate the air within the building, or damage the walls, floors, and ceilings; repairs can also be executed with less annoyance to the occupants of the building if the pipes are fixed outside. There is, of course, a slight additional danger of the pipes being frozen up in severe weather, but if the taps are perfect the danger is less than in the case of external soil-pipes, as the water passing through waste-pipes is often warm. If waste-pipes must be fixed inside the building they ought not to be buried in the plaster or in chimneys, but fixed with clips or tacks to backboards, so that they can be easily inspected and repaired.

6. Waste-pipes ought not to be connected to soil-pipes or drain-ventilating pipes, or to the traps of water-closets or slop-hoppers, but ought to be kept entirely distinct. An exception to this rule may be made in the case of washing-up sinks fixed by the side of slop-hoppers; the wastes from the sink may be connected to an inlet arm provided in the side of the hopper above the standing water of the trap.

7. All waste-pipes ought to be adequately supported so as not to drag heavily on the outlet of the trap. The seal of a trap may be destroyed by the trap being pulled out of shape by the weight of the waste-pipe.

8. Joints within the thickness of walls or floors ought to be avoided wherever possible; if they ought to be in positions where they can be seen and repaired without difficulty. The waste-pipes from baths are often laid under the floors. This can only be avoided in the case of ordinary cast-iron independent baths by placing supports of wood or other material under the cast-iron feet. If these raise the bath too high for children's use, it is an easy matter to provide a movable step. This raising of the bath not only allows the waste-pipe to be laid above the floor, but affords facilities for dusting and washing the floor under the bath.

9. Overflow pipes from storage or flushing cisterns must not be connected with waste-pipes, but must be carried through the nearest external walls in a conspicuous position to serve as warning-pipes. These pipes need not be trapped, as the traps would probably be unsealed by evaporation; but hinged flaps may with advantage be fitted on the ends to prevent the inlet of air and dust. It is a mistake to connect the overflow of a siphon flushing cistern to the flush pipe, even if there are no water company's regulations to prevent it, as such a connexion interferes with the siphonic action of the cistern.

OPEN-AIR BATH, EAST HAM.—Councillor F. G. Francis recently opened the open-air swimming bath which has been constructed by the East Ham Urban Council in the Central Park. The bath has been constructed by the Council's own workmen under the superintendence of the Surveyor, Mr. A. H. Campbell. It is an expenditure of 1,350*l.*, it is 90 ft. in length by 30 ft. in width, and of a depth tapering from 30 in. at the shallow end to 6 ft. at the deep end. The walls and floor are of concrete, finished with a surface facing of mosaic composition. There are fifty private dressing-boxes and two casual spaces for juveniles, and a chamber and water closet for a private bath. The water is supplied direct from the mains of the East London Waterworks Company, and the drainage is into the sewers of the Council.

OBITUARY.

THE LATE MR. HOPKINS.—The following additional particulars in regard to Mr. W. J. Hopkins, the late Diocesan Architect of Worcester, whose death was briefly recorded in our obituary column last week, reached us just too late for insertion in that issue. Mr. Hopkins was, we believe, articulated to the late Mr. Underwood, of Oxford, and early in life settled in Worcester. One of his most important works was the erection of the Corn Exchange, now the Public Hall, in Worcester. He restored the following churches: Norton, Upton Snodsbury, Grafton Flyford, Flyford Flavel, Kingston, Besford, Witford, Dodington, and several others. He designed the following new churches: Sackley, Hallow, Blackheath (near Birmingham), Wilden, Abberton, Holy Trinity, Worcester, and some others. He cleverly adapted the beautiful fourteenth century roof of the Gueston Hall to the new church of Holy Trinity, where it still remains as a standing reproach to the cathedral authority of that day, who caused the removal of the Gueston Hall. Mr. Hopkins was the architect of the new Parsonages of Bradley Green, Norton, and Tibberton, and of many new houses at Sidcup, Ascot, and Malvern; and the mansions of Parkfield (Worcester) and Kildangan (County Kildare). The latter was his last important work.

MR. W. H. LORDEN.—We have to record the death of this well-known contractor, which occurred suddenly at Southsea on the 8th inst. Mr. Lorden was born in 1837, and for many years was with Messrs. Lucas Brothers and carried out a number of their most important works. In 1871 he commenced business in Upper Tooting as a builder and contractor, and was senior partner until 1897 in the firm of W. H. Lorden & Son, retiring on account of declining health. Among the important works he carried out are the Croydon new post-office; soldiers' home, Westminster; several schools for the London School Board; Roman Catholic church, Streatham; St. Anselm's Church, Streatham; St. John's Church, Balham; new tower, &c., Framfield Church, Sussex; large blocks of artisans' dwellings at Marylebone and Wapping; infirmary extension, Kingston; nurses' home, Chelsea; several public libraries; stabling and depot for Wimbledon Urban District Council, &c.

GENERAL BUILDING NEWS.

BATH ABBEY.—The Bishop of Bath and Wells dedicated a few days ago the west front of Bath Abbey, which has just been restored under the advice of Mr. T. G. Jackson, R.A. The cost of renovation, so far as the west front is concerned, has been about 2,000*l.* The more expensive work of repairing the flying buttresses, which was not originally contemplated, is still proceeding.

CHURCH, GREENBANK, BRISTOL.—On the 1st inst. the new mission church of St. Anne's, Greenbank, was dedicated. The room may be arranged to accommodate 400 persons, and has vestry attached to it. The designs were by Mr. G. H. Oatley, and Mr. G. Humphreys was the contractor.

CONGREGATIONAL CHURCH, CHURCHTOWN, SOUTHPORT.—A new Congregational Church, which has been built at Churchtown, and has been erected from the designs of Mr. F. B. Halsall, architect, of Southport, has just been opened. The new building, the foundation stone of which was laid on July 18, 1900, consists of a new church with minister's vestry, Christian Endeavour room, choir vestry, classroom, and organ chamber. The church itself will seat about 700, the greater part of the sittings being on the ground floor, and the remainder in the gallery. Three entrances in the front lead to vestibules, the central doorway and vestibule being of greater width than those at the sides. These side vestibules each have a staircase to the gallery. The one on the north corner is octagonal on plan, and is carried up as a tower. There is also a side entrance leading to the vestry; Endeavour room, and choir gallery, a special staircase being provided for the use of the choir adjoining the vestry. The church is 57 ft. 9 in. by 42 ft. 6 in. inside on ground floor, the length on gallery level being 64 ft., exclusive of choir and organ gallery, which is 18 ft. by 17 ft. The Endeavour room is 20 ft. by 10 ft., and the internal height of the building is 26 ft. The roof is of pitch-pine of an ornamental character, the central portion being carried upon iron columns, the columns also supporting the gallery. The elevations are in pressed brick and Cullington stone. The principal front consists of a large central compartment, with the tower staircase on the north side and a lower structure for the south staircase. A four-light traceried window occupies the central portion of the front, with a single-light window at each side. The octagonal tower has buttresses on each angle, and is finished with flat roof and battlemented parapet. Two sides of the tower contain traceried windows, with hood mould and carved finial. The side elevations are divided into compartments by weathered buttresses, with two stories of windows between. The heating is by low-pressure hot water. The building is fitted with the electric light.

WYCLIFF BAPTIST CHURCH, ELSWICK-ROAD, NEWCASTLE-ON-TYNE.—The foundation stones of this building were laid on the 5th inst. The style is

perpendicular Gothic, freely treated. The accommodation in the church is for 306 adults, or for a mixed congregation of about 360. A future end gallery is provided for, to seat 100 adults or 120 mixed, or an eventual total of 470 mixed. The choir is on the platform in front of the pulpit; and the baptistry is also in the platform, covered when not in use. The organ is in an apse behind the pulpit. The building consists of a wide nave, with hammer beam, open timbered roof, and plastered ceiling, and double transepts on each side, with timber arches supported on iron columns, each transept being lighted by a three-light traceried window. Two two-light traceried windows will be placed in each side wall of the nave. There will be a projecting portico in front, with vestibule and inner lobbies with swing doors; and a vestry on one side and a staircase on the other side in the tower, leading down to the school and up to the gallery in the future. A staircase on each side of the pulpit will lead down to the school below the church and to the minister's and deacons' vestries. A ladies' vestry will be behind the pulpit. The seating is arranged semi-circularly on plan, so that every hearer directly faces the minister. The heating will be by hot water pipes and radiators. There is an exit door from the tower and another from the back into Northbourne street, the two front entrances being from Elswick-road. All doors open outwards. There is a spacious school under the church, and a church parson, 19 ft. by 13 ft., also heating chamber and lavatories, &c. The school will be well lighted by large windows into areas and streets. The windows are glazed with leadlights, and the external walls faced with red pressed facing bricks, with tawny terra-cotta dressings and tracery, &c. The contract for the building is 4,284*l.*, including boundary walls, gates, railings, &c., but exclusive of upper portion of tower. The builder is Mr. Alexander Bruce, Newcastle. The architects are Messrs. George Baines & Reginald Palmer Baines, Clement's Inn, Strand, London, W.C.

BAPTIST CHAPEL, SOUTHEND.—A new Baptist chapel, constructed of red brick with Bath stone dressings, has just been opened at the junction of Avenue-terrace and Milton-road. The chapel is 75 ft. long and 60 ft. across in its widest part, the width at the back, where the side seats are not continued, being 36 ft. At the back of the rostrum is accommodation for the choir. Provision has been made for the erection of galleries along the sides of the chapel and at the end; and the main entrance has been constructed to admit of its being surmounted by a tower. A church parson connected with the chapel, and there are also the minister's and deacons' vestries. A Sunday school has been built, the length being 57 ft. and the width 32 ft. The architect is Mr. F. E. Smee, and the builders Messrs. Davis and Leaney. The contract price, exclusive of the site, is 6,000*l.*

PRESBYTERIAN CHURCH, CARDIFF.—The foundation stones were laid recently of a hall in connexion with the Cardiff forward movement work of the Presbyterian Church of Wales. The new building is being erected on a site at the junction of Keppoch-street and Piane-newydd-square, Mr. W. Beddoe Rees is the architect, and his designs were selected in competition. The new structure will provide seating for 850, and will, when completed, cost about 4,000*l.*

BOARD SCHOOL, CHESTERFIELD.—A new school, to be called the Central School, has been erected by the Chesterfield School Board, at a cost of 15,000*l.* Besides affording accommodation for ordinary teaching, the school building includes provision for a pupil-teachers' centre, sufficient for an average attendance of thirty-six; a cookery centre, for fifty-four girls; a laundry centre, for forty-two girls; and also a swimming-bath. The bath is 75 ft. by 20 ft., and has a depth of water running from 3 ft. to 6 ft. 6 in. There are in connexion with it slipper and foot baths, and forty dressing-boxes. The school is built of Ellistown pressed bricks, with facings of buff terra-cotta. The roof is covered with blue slates, and the woodwork is painted green. There are six entrances, one being set apart for the pupil-teachers' centre. The interior has been planned to accommodate 1,200, and there are three floors, the floor space covering three-quarters of an acre. The basement contains the swimming-bath, the laundry, the cookery centre, and covered playgrounds. The ground floor consists of a central hall, 90 ft. by 30 ft., and eight classrooms, each 24 ft. by 24 ft., and accommodating sixty scholars. A feature has been made of the baby department, which will take in sixty children. The first floor also has a large central hall and a like number of classrooms, which, as below, are divided from the central hall by glass screens. There is a special playground for each department. The furniture has been supplied by the North of England School Furnishing Company, Darlington, and Messrs. Illingworth, Ingham, & Co., Leeds. Messrs. Tiltman (London) and Cecil Jackson (Chesterfield) are the architects, and the contractors were Messrs. Kellett & Co., Leicester.

BANK, LIVERPOOL.—On the 5th inst. the business of Park's Bank, limited, hitherto conducted at 44, Cook-street, was transferred to the new premises, 22, Castle-street. Externally, the lower walls are of unpolished granite from the Kemnay Quarry

Aberdeenshire. The walls of the first floor and upwards are faced with marble quarried at Pavaonazza, relieved by green bands of Cipolino marble. The architraves of the windows and the cornice of the building are of red terra-cotta. Two rows of dormer windows rise through the high-pitched roof, and the building is the highest in Castle-street. The hanking hall is a circular building 60 ft. in diameter, and lighted by a circular cupola 20 ft. in diameter. The walls are wainscotted in oak, and the eight supports are adorned with bands of Cipolino marble, and a cartouch containing an oval slab of Escasia marble. The floor is laid in marble and York stone and asphalt, from the design of Mr. Norman Shaw. The counter is built of Istrian marble, with a mahogany top, the rim being inlaid with boxwood and ebony. The basement is used partly for clerks' cloakrooms and lavatory, and also for the bank's strongrooms. The bank is to occupy the ground floor and basement and entresol; the upper floors are to be let for offices, and have already been partly taken. The architects were Mr. Norman Shaw, R.A. (London), and Messrs. Willink & Thibessence (Liverpool), and the contractors Messrs. Jones & Sons, Liverpool.—*Liverpool Post*.

NEW POLICE STATION, BERWICK.—A new police-station has just been opened at Berwick. The site of the new buildings has a frontage to Church-street of nearly 70 ft. The principal elevation is of polished sandstone, the roof being covered with red Staffordshire tiles. The design is Renaissance in character. The police station, occupied for the most part by the police station, with entrance about the centre of the main front, and consists of charge-room, chief constable's office, parade-room, and seven cells. The upper floor is devoted exclusively to the police court and rooms connected therewith. The court room is 40 ft. long by 21 ft. wide. A public gallery, with direct access from public staircase, occupies one end of the room. A magistrate's room, a magistrate's clerk's room, and room for witnesses are placed opening off an upper hall approached by the public from the staircase entered on the south side of the main building, and by the magistrates from staircase under tower, with entrance from Church-street. In the rear of the site a house for the superintendent is provided. The design was selected in open competition. The contractors were Messrs. Bruce & Sons, Kelso, mason work; Messrs. J. & F. Forrest, Edinburgh, carpentry and joinery; Messrs. Rule & Sons, Tweedmouth, slating and plastering; Mr. Geo. Macadam, Berwick, plumbing; Messrs. J. Turner & Son, Berwick, concrete and cement work; Mr. R. J. Richardson, Berwick, painting; Mr. Thomas Thompson, Berwick, supplied the grates, mantles, and wrought-iron work. Mr. Hugh Steel acted as clerk of works, the architects being Messrs. Cackelt & Burns Dick, Newcastle-on-Tyne. The cost of the new building was estimated at £4,045.

PROPOSED ASSEMBLY BUILDINGS, BELFAST.—The plans of the Assembly buildings it is proposed to erect for the Presbyterian Church of Ireland have been prepared by Messrs. Young & MacKenzie.

WAREHOUSES, BELFAST.—Warehouse buildings are to be erected for Messrs. J. Fulton & Co., Limited, on the site of the old "House of Correction" in Howard-street. The contractors are Messrs. J. Henry & Sons, and the architects are Messrs. Young & MacKenzie.

NEW CO-OPERATIVE PREMISES, ABERDEEN.—The following tenders for new central premises, Gallowgate, for the Northern Co-operative Company, Limited, have been accepted: Mason work, G. Hall; slater work, Alex. Adam & Co.; plaster work, Geo. Gibb; painter work, G. Watt & Son; ironwork, Jas. Abernethy & Sons. The total cost will be about 10,000l., and Messrs. Brown & Watt, Aberdeen, are the architects.

CRICKET PAVILION, NEWPORT, MON.—A cricket pavilion was opened at Newport by Lord Tredegar recently. The building has been erected at a cost of 1,500, from designs by Messrs. Swash & Bayn, architects, and is a two-story building of red brick, roofed with red tiles.

PROPOSED DRILL HALL, GRIMSBY.—It is proposed to erect in Doughty-road, Grimsby, a new drill-hall for the headquarters companies of the new Third Battalion of Lincolnshire Rifle Volunteers. Mr. F. W. Croft is the architect.

NEW INFIRMARY, RICHMOND.—The foundation stone of the new infirmary and nurses' home, in course of erection by the Richmond Board of Guardians, was laid recently. The new premises will consist of six separate buildings, viz., female infirmary block, lying-in ward, nurses' home, male infirmary, lunatic wards and ambulance house and mortuary. The five blocks intended for habitation have been arranged so that they each run longitudinally N.E. and S.W. The female and male infirmary blocks are connected on each floor by corridors, from which short branches connect to the lying-in ward and nurses' home. Along the centre of the ground floor main corridor a trench is formed in which the various mains will be placed. The female block comprises ground, first, and second floors, each containing a large ward, which provides for twenty-four beds, a smaller ward containing three beds, a dayroom and duty-room, besides larder, linen store, brush store, and the necessary sanitary accommodation. Access to the twenty-four bed ward is obtained by folding doors from the landing

at one end, and at the other opens on to an external balcony. The dayroom is 20 ft. in length. Adjoining the larder and stores is a branch passage, leading to the main sanitary annexe, which provides accommodation for each floor. The lying-in ward is placed next to the female infirmary, and is approached by a short branch from the main corridor. The ward has six beds and several duty and labour rooms. The dispensary is in the same block, but is approached by a separate entrance from the corridor. Respecting the nurses' home it may be mentioned briefly that the block consists of three floors, from each of which access is obtained to the main corridor. The block contains nurses' dining and sitting-rooms, with separate dining-room for subordinate nurses or wardmaids, and a private sitting-room, with bedroom attached, reserved for the superintendent nurse. Kitchens, storerooms, and bedrooms are arranged with due regard to comfort and economy of space. The male infirmary is similar in arrangement to the female infirmary, and accommodation, as in the other case, is provided for eighty-one inmates. There is further some small provision for the lunatics—the accommodation being only for cases pending removal to the county asylum, and lastly, a small ambulance house and mortuary. The entire series of buildings is to be in stock brick with brick facings of deep red, and the slating will be green. Mr. S. N. Soble is the builder and Mr. Edward J. Partridge, F.S.I., is the architect, and Mr. A. G. Barley, clerk of the works.

POST-OFFICE, BARNSTAPLE.—A new building to accommodate the post-office is to be erected in Cross-street, Barnstaple. It will be of two stories, and will have an entrance from Castle-street for the mails. The plans have been prepared by Mr. F. W. Petter, of Barnstaple.

SANITARY AND ENGINEERING NEWS.

BALMORAL BRIDGE.—The bridge over the River Dee at Balmoral, the Highland residence of the late Queen Victoria, has, during the past two months, been undergoing repairs under the direction of Sir William Atrol. The piers and structure have been strengthened and improved, and the bridge has now been reopened for traffic.

WISETON, DONCASTER.—A scheme of main sewerage and sewage disposal, prepared by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, has been approved, and an immediate start is to be made with the work. The method of sewage disposal consists of treatment in self-acting bacterial tanks, the effluent from which will discharge into the adjoining water-course.

PIER, CROMER.—Lord Claud Hamilton opened a new iron pier at Cromer on the 8th inst. The pier has a deck 500 ft. long and 40 ft. broad, with bays extending to 60 ft. The head extends to a width of 112 ft. The engineers were Messrs. Douglass & Arnott, and the contractors Messrs. A. Thorne, B. Cooke & Co., and A. Faisey & Son.

FOREIGN.

FRANCE.—M. Edouard Aynard has been elected a member of the Academie des Beaux-Arts, in the place of the late M. Philippe Gille. The new academician, who is a Vice-President of the Chamber of Deputies, is the author of a number of interesting studies on the Industrial Arts and on museums.—The Municipal Council of Paris will consider, during next Session, the question of lighting the Tuilleries Gardens, so as to facilitate their being opened to the public at night. The cost of the necessary installation is estimated at 95,000 fr.—The exhibition of the "Peintres Lithographes" at Paris (Rue Daubigny) has excited a good deal of interest. The exhibitors, who number twenty-seven, have not confined themselves to black and white work, but also exhibit studies in coloured lithography and in pastel.—The old church at Coulommiers, built in 1220 by order of Philip Augustus, and which is in a ruinous condition, is to be rebuilt with the funds from a legacy of 350,000 fr. left for the purpose.—A Society of Architects of the Côte d'Or has been founded at Dijon, M. Suisse, the present diocesan architect, being elected president.—The monument to the memory of M. Felix Faure is to be inaugurated shortly at Pêre la Chaise.—The Municipal Council of Paris has under its consideration a proposal to erect M. Saint-Marceau's monument to Daudet, which was in the New Salon, in the Avenue Gabriel, Champs Elysées.—A society has been formed under the title of the "Société des Artistes Decorateurs," presided over by M. Dubure, the object of which is to group together all the decorative artists, and to organise exhibitions of decorative art.—M. Emil Faidt-Dider has been appointed official architect of the Department of the Meuse for the Arrondissement of Commercy, in place of M. Verneau, retired.—The sixty-eighth Congress of the Société Française d'Archéologie is to be held at Agen, and will terminate with an excursion in the Department of Gers. M. Lucas has been appointed delegate to the Congress from the Société Centrale des Architectes.—The city authorities of Marseilles are about to undertake

shortly the important works voted by Parliament for the rebuilding and sanitation of the Bourse quarter. The cost of this undertaking is estimated at 50,000,000 francs.—An exhibition of the works of M. Alexandre Léon, the painter, has been opened at the Georges Petit gallery. M. Léon was a pupil of Puvion de Clavaux, and the collection of paintings, pastels, cartoons, and drawings in this exhibition, show something of the spirit of his eminent teacher, and are remarkable both for power of drawing and nobility of conception.—M. Barrias, the sculptor, has just completed a model for a monumental clock which is to be placed in Rue Vivienne, on the new buildings of the Bibliothèque Nationale. This clock, flanked by two figures symbolising "Day" and "Night," will be also decorated by a seated figure personifying "Study." The clock face will be surrounded by a laurel garland, accompanied by two torches connected by garlands with a helmeted head of Minerva placed above. The sculptures are to be in stone.

GERMANY.—The Emperor Frederick's museum now being erected in Berlin, opposite the Old Castle, will probably be inaugurated in October, 1903. The building is intended to preserve paintings and sculptures of the post-Classic period, especially of the Renaissance, as well as collections of engravings, &c. The site of the museum will be connected with the adjoining streets by two bridges leading to the open square on which the late Emperor Frederick's monument is to be erected. The paintings by Professor Augustus Vogel are approaching completion, and the statues representing the arts are being placed in position.—An art exhibition opened in Berlin contains forty-five designs for the statue of Richard Wagner. One of the most interesting, perhaps, is that representing the composer seated in an arm-chair, as though thinking out a melody. In front of him stands a figure of Music, a majestic woman with a lyre, supporting another woman representing Poetry. The figure of a youth, representing Legend, kneels in front of them, and bands a crown to Poetry as a subject for composition. His symbol, a dragon, is lying in a hollow behind him, and two sphinxes, indicative of the mysteries of Wagner's music, are resting on the two sides of the monument.

MISCELLANEOUS.

ABERDEEN ARCHITECTS AND TRADESMEN.—The Society of Architects, Aberdeen, recently issued a notice to the various master tradesmen in the city, requesting that they should recognise only qualified architects in accepting contracts. In consequence of this, a second association of master slaters, which has been formed, has expressed the opinion that every man in business should have a free hand. The following notice has been issued by the secretary *pro tem*.—"A meeting of those in favour of resisting the action recently taken by the Aberdeen Architects' Society in endeavouring to stifle competition and create a monopoly in the building trades, will be held in the Square Room, Music Hall-buildings."

A PATENT OFFICE GUIDE.—We have received from the Patent Office, where it is published, a "Guide to the Search Department of the Patent Office Library," forming No. 4 of the Patent Office Library Series. This gives directions as to the volumes in the library which may be most usefully consulted in the search after previous specifications, and a list of the headings under which inventions and patents are classified; also a list of trade names for various articles or inventions, with a column giving the definition of the nature of the object to which the trade name is applied.

THE PATENT OFFICE REPORT FOR 1900.—In his official Report for the twelve months ended on December 31 last the Comptroller-General of Patents, Designs, and Trade-Marks, under the Patents and Cognate Acts, 1883-8, sets forth that whereas the number (23,922) of applications for letters patent is again less than that (25,800) for the previous year, the receipts from patents fees amounted to 204,140l., as compared with 202,771l. in 1899, whilst the receipts from designs and trade-marks fees show a decrease in each instance. The total receipts amounted to 226,091l., as compared with 225,700l. in 1899, the increase of the receipts from patents fees, in spite of the falling-off in the number of patent applications, being again due to a continued increase in the number of the annual fees paid for the renewal of patents. The Comptroller-General points out that the number of renewals fees paid in each year bears a more or less constant relation to the number of sealed patents dated from four to thirteen years previously, and that as the number of sealed patents has gradually increased, so the renewal fees have increased in a like ratio. The total expenditure, which includes 21,814l. upon new building works, amounts to 120,667l.; the surplus of receipts above payments is 105,424l. The corresponding totals for 1899 were 123,216l. and 102,484l. respectively. By the end of the year the fabric of the new Patent Office buildings (Messrs. Perry & Co. are the contractors) was completed, with the exception of the roof of the library. The whole cost of the works, together with the site and 8,800l. on account of furniture, is estimated at 102,500l., and of that sum

nearly 130,000, had been expended at the close of the year. The elevation in Southampton-buildings has been designed, we may here mention, by the Office of Works, so as to correspond with that of the block facing the garden-court of Staple Inn, which was designed by Messrs. Wigg & Pownall in 1843, but was modified in its details a few years ago for purposes of the Patent Office. The balance-sheet of income and expenditure enumerates the following items under payments:—Salaries (for a total staff of 306), 61,002l. 10s. 6d.; printing, drawings, &c., 23,500l.; and new building works, 2,817l. There are several other appendices to the Report. One of them tabulates the "countries of origin," and shows that in 1900 the applications derived from England and Wales were 13,775 (a decrease from 15,354 in 1899); the United States, 3,784 (a small increase); Germany, 2,631 (a small decrease); France, 946 (a small decrease); Scotland, 1,154 (a small increase); Austria, 478; Ireland, 371 (a small decrease); Belgium, 184; Canada, 156; Switzerland, 150; Sweden, 104; and Italy, 100; no other country contributed as many as 100. The numbers received from the United States, Austria, Denmark, Norway, and Switzerland exceeded those in any previous year, and there was an increase in the number of applications derived from Queensland, New Zealand, Sweden, China (Hong Kong excluded), Japan, and Egypt as well. The use of invention in the cycle industry, which developed so suddenly in 1896, still continues; inventions affecting acetylene generators have diminished by a ratio exceeding 25 per cent, and there is a decline under the heads of weaving, lacemaking, electrical lamps, drains, hydraulic machinery, and other categories. A remarkable feature of the applications for the year is the large increase in the number of inventions concerning electric traction, and the Report says that more than a hundred applications were made by one firm of electrical engineers alone. There is, moreover, a marked improvement in the class-divisions for out-door seats for trams, &c., motor-cars, air and gas engines, automatic and non-automatic couplings for vehicles, rotary engines (including turbines), dynamo-electrical generators, switches, cut-outs, couplings, &c.; and electrical telegraphs and telephones. There are several apparatus, machine tools, and photography, which attained its highest point since 1883. Of the applications themselves 549, or nearly 23 per cent, were made by women. Some calculations demonstrate that fifty patents have been sealed upon every 100 applications received, that out of every 100 patents sealed the number kept alive and allowed to lapse respectively are, after thirteen years, five and two; and that out of the 9466 patents of 1887 were maintained 529, or 5.6 per cent, by the payment of annual renewal fees for the full period of fourteen years.

ELECTRIC LIGHTING, HOYLAKE, CHESHIRE.—On the 6th inst., Mr. H. P. Boulnois, inspector under the Local Government Board, held an inquiry at Hoylake regarding an application by the Hoylake and West Kirby District Council for permission to borrow 13,500l. for the extension of electric lighting works and cables. Mr. Roderick Williams, Clerk to the Council, explained that the Council had already received sanction to borrow 27,000l., but owing to the great demand for electric light they had expended this, and had really exceeded it by 3,000l. Mr. T. L. Miller, consulting electrician, gave evidence as to the plant and mains, and Mr. Thomas Foster, surveyor, detailed the construction of the buildings. There was no opposition.

PROPERTIES FOR SALE.—In the course of this month will be offered for sale by auction, at the Mart, the Tower Estate at Pangbourne, and the Ealing Theatre, together with the adjoining Lyric Restaurant and Assembly Rooms. The former property consists of about 340 acres, including Upper Bowden Farm and 148 acres of arable land. The mansion house, known as "The Towers," was built for the late Mr. John Donaldson by Messrs. Foster & Dicksee, after Mr. Belcher's plans and designs. It is described and illustrated in the *Builder* of November 26, 1898; July 8, 1899; and January 13, 1900. The theatre, restaurant, and assembly-rooms at Ealing, forming one block having a frontage to the Broadway, were built about two years ago upon the site of the old Lyric Hall, and cover an area of nearly half an acre. The designs and plans were prepared by Mr. G. H. Fargeter and Mr. Walter Emden (who was the consulting architect for the theatre portion). The contractors for the whole block were Messrs. Beer & Gash, of Wharf-road, City-road.

A NEW BURNER FOR INCANDESCENT GAS LIGHTING.—"The Self-Intensifying Kern Burner" is the name of a new burner for lighting streets and industrial works by incandescent gas light, which is being introduced by the Wel-lach Incandescent Gas Light Company. The burner is a Kern burner so modified that with the comparatively large gas consumption of 10 cubic feet per hour, the head of the burner is made sufficiently small to fit into a No. 4 high-pressure Kern mantle, a slight alteration being made in the internal construction of the burner head. A glass chimney suspended from the lower end of a metal chimney in the upper part of the lantern surrounds the mantle, and the elongated chimney thus produced enables the so-called "self-intensification" to be effected without the aid of a

greater gas pressure than that under which gas is usually supplied to consumers from the gasworks. A series of these new burners, arranged in lanterns of various designs, has been exhibited this week at the Niagara Hall, Westminster, and it is claimed that an illuminating power of 300 candles is obtained with a consumption of 10 cubic feet of gas per hour—a result very little inferior to that obtained from gas under 10 in. pressure, the use of which entails the provision of costly compressing apparatus.

St. AUGUSTINE'S CHURCH, THOMAS-STREET, DUBLIN.—The decoration and carving of the Chapel of the Sacred Heart, which has been in progress for some time past, has just been completed in this church. The whole of the work has been carried out from the designs of Mr. George C. Ashlin, R.H.A., Dublin, and the supervision of the work for him was done by Mr. Thomas A. Coleman.



LEGAL.

EMPLOYERS' LIABILITY ACT.

SOME QUESTIONS AS TO THE CARRYING OF CEMENT.

AT Brompton County Court, on Monday, before Judge Stonor and a jury, Ingram Munday, a builder's labourer, Peabody-buildings, S.W., brought an action, under the Employers' Liability Act, against Messrs. Squire & Potter, builders and contractors, 17, Walton-street, Port street, S.W., claiming damages in respect of personal injury sustained owing, it was said, to negligence on the part of the defendants or their servants.

Mr. W. M. Thompson, counsel, appeared for the plaintiff, and Mr. E. F. Leaver, counsel, for the defendants.

Mr. Thompson explained that the plaintiff, last November, was employed by the defendants upon a job at 95, Sloane-street. A large quantity of cement was being used, and for a time the bags were brought in by the back entrance. On November 10, it was found that some planks had been taken away from the back, making it difficult for any one to cross some excavations, and the general foreman on the job directed the plaintiff and other men to carry in bags of cement by the front entrance in Sloane-street, down some stone steps into the basement. The first thirteen steps went down perfectly straight and were well lighted, but two return steps at the bottom—at right angles to the thirteen—were in darkness. While carrying a bag of cement upon his back the plaintiff slipped or stumbled upon the first of these two bottom steps and fell, breaking his left leg. The plaintiff was kept in St. George's Hospital from the day of the accident until January 2, and from that date until March 6 he stayed at the hospital's convalescent home at Wimbledon. He (the learned counsel) submitted that the defendants' foreman had been guilty of negligence (1) in ordering the plaintiff to carry the cement down the steps when there was no handrail there, and when they were in semi-darkness, and (2) in not providing sufficient planks for the men to cross the excavations at the back, as they had done prior to the day of the accident.

The plaintiff bore out his counsel's opening statement.

Mr. Leaver said that he admitted his clients' liability under the Workmen's Compensation Act, but denied that there had been any negligence with respect to the accident for which the defendants were responsible.

In cross-examination, the plaintiff said that he had taken two bags of cement down the steps in question before the accident occurred. It was not a fact that he slipped from one of the first thirteen steps, which were well lighted. He held the bag with one hand, and was not aware that the proper way to carry a bag of cement was to hold it with both hands. Some men, in fact, preferred not to hold the sack at all, but allow it to simply rest upon the back and shoulders.

Mr. Arthur Morley, M.R.C.S., &c., formerly house-surgeon at the hospital, spoke as to the man's injuries, and said that the plaintiff would not be able to resume his ordinary work for probably two or three months.

Charles Smith, the general foreman on the job at the time of the accident, said that as it would have taken a considerable time to put down fresh planks at the back, he thought it best to tell the men to take the cement in by the front entrance. He would not, however, have sent the plaintiff down the steps with the cement if he had not considered the work perfectly safe.

For the defence, Frederick Henry Symes, another general foreman in the employ of the defendants, said that he considered it perfectly safe for the men to carry bags of cement down the steps in question; in fact, the remainder of the bags, after the accident, were taken into the basement by the same steps. When witness saw the plaintiff in the hospital, the man said: "It was a pure accident—no one was to blame. I stepped too far forward, and went down two steps instead of one."

William Horton, a labourer in the defendants' employ, stated that the plaintiff had said to him that it was a pure accident, and that he must have slipped. The witness went on to say that he would

have preferred to carry the cement down the steps in question than along the planks at the back of the premises.

Cross-examined: After the accident a light was placed at the bottom of the steps.

Frederick Farthing, a scaffolder, stated that he carried the remainder of the cement down the steps after the accident.

Mr. Benjamin Banyard, a builder, said that he had inspected the steps in question, and had he been on the job he would not have hesitated in directing the men to carry the cement down the steps.

Cross-examined: Owing to a man, when carrying a bag of cement, having his head down, it was desirable that he should have "a certain amount" of light.

Joseph Green, a builder's foreman, said that he also saw the steps in question, and considered it quite safe for a man to carry bags of cement down them.

Mr. William D. Squire, one of the partners in the defendant firm, said that he considered it perfectly safe for a man to carry cement down the steps in question. A handrail was not necessary, indeed, his experience went to show that had there been a handrail the men would not have used it. There would have been no difficulty whatever in the men having more planks at the back had they asked for them.

The jury found that the way down the steps was not safe for the plaintiff when carrying a bag of cement; that he was not guilty of contributory negligence; that he did not thoroughly understand the risk he ran, and voluntarily undertake the risk, but that he carried the cement down the steps simply in obedience to orders. This was a verdict for the plaintiff, in whose favour the jury assessed damages at 50l.

His Honour gave judgment accordingly, and allowed costs.

ACTION TO RESTRAIN ALLEGED OBSTRUCTION IN VILLIERS-STREET.

The case of W. H. Chaplin & Co., Limited, v. the Mayor, Aldermen, and Council of Westminster came before Mr. Justice Buckley in the Chancery Division on the 17th and 12th insts.

This was an action by the plaintiffs, a firm of wire merchants, for an injunction to restrain the defendants from erecting or placing any structure or post on the west side of Villiers-street, Strand, in such a position as to cause an obstruction to the plaintiffs as occupiers of No. 10, Villiers-street. It appeared that the plaintiffs had offices and very extensive cellars in Villiers-street leased from the South-Eastern Railway, and the defendants were proposing to put up a standard for carrying an electric light which the plaintiffs contended would materially interfere with the loading and unloading of their vans.

Mr. Henry Terrell, K.C., and Mr. Hatfield Green appeared for the plaintiffs, and Mr. Astbury, K.C., and Mr. Eustace Smith for the defendants.

His Lordship in giving judgment said he thought it was obvious that to place a post where it was proposed to place one would affect the elasticity of the plaintiffs' proceedings, but the only right the plaintiffs could claim was a right as members of the public, and they could not assert their individual convenience against the convenience of the public in general. It had not been proved that the defendants were acting unreasonably in placing a post where they proposed to place it. Both in law and in fact, therefore, the plaintiffs failed, and the action must be dismissed with costs.

IMPORTANT POINT AS TO DILAPIDATIONS UNDER A COVENANT.

The case of Terrell v. Murray came before a Divisional Court of King's Bench composed of justices Bruce and Phillimore on the 17th inst., on a motion by defendant to set aside the judgment of the Official Referee in an action brought by Mr. Alfred Terrell against the defendant, Lady Murray, to recover a sum of money alleged to be due in respect of dilapidations under a lease of premises at No. 20, Harcourt-terrace, South Kensington. The lease was dated August 9, 1893, and granted to the defendant by a Mr. Taylor, and was for a term of seven years from September 29, 1893. The lease contained no covenant to repair, but the tenant covenanted to deliver up at the expiration, or sooner determination, of the lease, the premises with all fixtures attached thereto, in as good repair and condition "as it now is, reasonable wear and tear and damage by fire excepted." The plaintiff acquired the reversion of the lease from Taylor, and at the expiration of the term made a claim for 112l. under the above covenant. The action was referred to the Official Referee, who found that the sum of 39l. was due from the defendant, which included 12l. for painting the brick-work, and 5l. for repointing certain of the kitchen-floor which had become damaged by dry rot. The Official Referee held that the fact that the mischief which necessitated the above items of repair had arisen through lapse of time did not excuse the defendant from executing the repairs. From this decision the defendant now appealed.

For the appellant it was contended that the effect of the covenant was that the tenant was liable only for commissive waste and not for permissive waste, and that reasonable wear and tear included deterioration due to weather or to lapse of time, and that the items in question were not properly chargeable to the defendant under the covenant.

For the respondent it was contended that the tenant would be liable for commissive waste apart from the covenant, and also that under the covenant the tenant was liable to do such repairs as would prevent damage by time or weather, and that such repairs would include the painting of outside wood-work.

Mr. Justice Bruce, in giving judgment, said his opinion was that the meaning of the covenant was that the tenant was bound at the end of the tenancy to deliver up the premises in as good condition as they were in at the beginning, subject to the following exceptions, viz., dilapidations caused by the friction of air, dilapidations caused by exposure, and dilapidations caused by ordinary use. He did not think that outside painting was a thing the tenant was bound to do under the covenant, and as the amount due to the plaintiff would thus be reduced to the amount paid into court, there must be judgment for the defendant.

Mr. Justice Phillimore concurred, and the appeal was accordingly allowed and judgment entered for the defendant.

Mr. Shearman appeared as counsel for the appellant (defendant), and Mr. Bonsey for the respondent (plaintiff).

ACTION BY FOREMAN CARPENTER FOR PERSONAL INJURIES.

THE case of *Simons v. The Birkbeck Building Society* came before Mr. Justice Douglas and a common jury in the King's Bench Division on the 11th inst., an action by the plaintiff, a foreman carpenter in the employ of Messrs. Nichols & Co., for damages for personal injuries sustained through the alleged negligence of the defendants.

It appeared from the opening statement of Mr. Kemp, K.C., that the plaintiff, prior to the accident, had been earning 55s a week. He had saved some money, and was desirous of buying a house, but not having a sufficient sum laid by, he borrowed some money from the Birkbeck Building Society. The loan was returned in monthly payments, his wife being in the habit of taking the money to the Society. On August 13, however, the plaintiff took the money to the bank. Never having been there before, the plaintiff asked where he should go, and understood the porter to say, "Third floor on the lift." The plaintiff looked round, and seeing the entrance to the lift walked towards it. There was no light, and the plaintiff, instead of walking into the lift, fell down the shaft, a distance of some 15 ft., sustaining severe injuries. For over a month he was laid up and unable to do any work, and now he could only earn 45s a week instead of 55s. In these circumstances he claimed damages for the injuries he suffered and for the loss of ability to earn the old rate of wages.

For the defendants it was contended that the lift door was only open some 8 in. or 10 in. at most, and that the plaintiff had opened it further so as to enter. The defendants alleged that the plaintiff had not suffered very serious injuries, having only sprained his ankle and bruised his ribs, and not broken them, as had been said.

John Valdey, a fireman in the employ of the defendants said that the plaintiff on the occasion in question asked him where ground-rent loans were repaid, and he replied, "On the fourth floor; the lift will be down in a minute." Soon after witness heard the lift door open, and he thought the lift had come down. Then he heard the plaintiff fall, and he went and helped him up.

Cross-examined: The lift-attendants' orders were to keep the lift door locked. It was not locked on this occasion.

In the result the jury awarded the plaintiff 150*l.* damages.
Judgment accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

2,702.—A BRAKE DYNAMOMETER: *E. H. Rieter*.—A ring that will make a slightly rocking movement, limited with stops, carries a series of magnetic poles; a heavy metal ring is caused to rotate within the rocking ring, with the shaft, and the amount of weight upon an extended arm which may be needed for preventing the rocking ring from being moved under the induced currents will give a measure of the power employed. In another form the ring may be fixed and the poles may rotate.

2,711.—A DEVICE FOR USE WITH WATER-HEATERS: *H. T. Fenlon*.—In order that the gas supply of a geyser or some similar water-heater shall not be turned on, or the water supply be turned off, independently the one from the other, the handle of the gas-tap is fastened in the closed position by means of its engagement with a pierced plate upon the handle of the water-tap. When the water-tap is opened the gas supply can be turned on and the water-tap handle cannot be closed beyond

a certain limit. For use with a geyser the water-tap is connected to the boiler and the gas-tap to the burners, vessels being provided for the circulation of products of combustion to the chimney.

2,719.—TRIPOD STANDS: *W. Greenwood*.—Each leg consists of three rods, the two outer rods being joined at their lower ends with a clip through which the third rod will slide, and having two bands with guide-wings that hold the three rods together. When the two outer rods are caused to spring apart the bands will grip the inner rod, its action being aided by the spring portion of the clip. In the case of round rods the wings upon the bands are not required. Reference should be made to No. 14,652 of 1898 for the means of separating the group of three rods.

2,739-40.—CONSTRUCTION OF FIREPROOF AND SOUNDPROOF ROOFS, CEILINGS, FLOORS, &c.: *J. W. Green*.—Ribs are fashioned upon tiles for floors, ceilings, &c., so as to form insulating air-spaces beneath the girders, and in their undersides are dovetailed grooves which will take the plaster. Swivelling clips, or some such fasteners, secure the tiles to the lower flanges of the girders, and concrete is filled in over arches of sheet-iron. The spaces will serve for preventing the transmission of sound and for the laying of wires, pipes, and so on. For fireproof and soundproof floors and roofs are devised hollow blocks of terra-cotta, of which the V-shaped interlocking sides and dovetailed grooves will engage with the plaster and concrete, and the recessed ends with the flanges of the girders. The placing of the blocks is facilitated by the cutting away of their opposed diagonal corners.

2,759.—A COMBINED GAS AND COAL STOVE: *W. Youlton*.—In one form the gas-stove consists of two halves, right and left, each half being hinged upon its separated gas-supply pipe in order that it may be turned either in front of the coal fire or into recesses at the sides, which are provided with screens upon hinges. In another shape the gas-stove is pivoted on to its supply-pipe that it may be turned either up in front of the coal-stove or down into a box below the hearth. In another shape the two halves of the gas-stove are arranged in the recesses at the sides, in which case their screens can be folded in front of the coal-grate when the latter is not being used. Their flues are set by the side of the coal-fire flue, and the respective flues are cut off from the chimney with a register.

2,763.—A DRAWING-BOARD: *J. F. Gjellerud*.—A base, or underlayer, composed of two cards and or similar sheets pasted together, is fitted between two parallel guides attached to the drawing-board. The upper surface of the underlayer is finish with the upper surfaces of the guides. To its top sheet is fastened a drawing-block, which is made up of a set of sheets held together with glued paper-strips, and is retained in its place within the guides with a small spring lock, whilst an elastic band holds a sheet of horizontal or other paper that may be secured to the lower sheet of the underlayer.

2,774.—MANUFACTURE OF WHITE LEAD: *G. Bischof*.—The white lead, having been washed and pressed in a filter-press, is ground in oil without having been previously dried. White lead, about one-third, is pugged with oil, about two-thirds, the separated water is drawn off, then the remainder of the white lead and oil are added and pugged, and the superfluous water is abstracted by means of a current of heated air directed over the mixture when it is in the pugging mill. The white lead employed is obtained by the process specified in No. 11,002 of 1890.

2,775.—A DOOR-CHECK: *N. O. Bond*.—Blocks pivoted to rotating arms form a centrifugal block, the blocks being mounted so that they shall be free from an enclosing flange until the centrifugal force throws them out and, by causing them to rub against a leather lining of the flange, checks the motion of the door. A link joins the end of a lever to the door, and a pawl upon the lever engages with a ratchet-wheel set in connexion with the rotating arms of the brake.

2,812.—AN APPLIANCE FOR USE WITH ELECTRICAL CONNEXIONS: *E. F. Woodman and H. A. Fiske*.—In one form of the invention, which is devised for effecting a change of connexion when the temperature exceeds a certain limit, a cup or controller made of solder or some other fusible material is retained loosely upon a non-conducting cover by its flange. In the cup rests the lower end of a spring, which under normal conditions keeps the two contacts asunder. As the cup becomes melted the spring contributes to its disintegration, whereupon another spring falls upon one of the contacts so as to complete an alarm circuit. In another adaptation a different kind of spring is used for normally pressing the contacts together, the circuit being broken with the fusing of the cup.

2,867.—THE MOULDING OF BRICKS, PIPES, TILES, &c.: *C. Schlickeisen*.—In order that one machine may produce at the same time two or more different articles, the inventor provides side openings or dies as well as the customary mouthpiece or die at the end of the extrusion machine or pug-mill shaft. The lateral dies direct the clay by means of inclined or curved blades, which are set between the screw-blades, and may be extended parallel to the shaft. The mechanism allows for the changing of the dies and the mouthpieces can be lengthened or shortened so as to control the amount of pressure exerted.

2,871.—A KEY-LOCK: *H. Loose*.—In order that one or the other of two keys may serve the lock is made with two keyholes upon one side or upon both; the bolt is fashioned with two double keyways, and has notches for engagement with a spring-controlled and vertically-sliding tumbler which either of the keys can operate, as its lower edge is inclined so as to ensure engagement with the key that fits one of the two keyholes.

2,876.—MECHANISM FOR CRANES: *W. H. Morgan and A. D. Taylor*.—In the case of cranes used in foundries the inventors contrive that the upper portion of the trolley shall be rotated upon a round truck by means of a motor-driven pinion that is set in gear, with and will run around a fixed rack upon the lower portion of the trolley; either one of a pair of endless lifting-chains is passed over either one of a pair of sprocket-wheels and hangs in two loops, the forging being hung in a short endless chain laid over a sprocket-wheel, which is driven with spur-gearing from two sprocket-wheels, over which the two lifting chains are passed. Or the two motors the one serves to drive the first-named sprocket-wheels in only the same direction, whereby the forging is turned simply upon its own axis; the other motor will drive those sprocket-wheels in opposed directions for raising or lowering purposes. If both motors are worked together the forging can be turned, and lowered or raised, at one and the same time.

2,886.—MANUFACTURE OF PORTLAND CEMENT: *J. O. Walk*.—Burned lime mixed with water holding sodium nitrate in solution is added to ground blast-furnace slag to compensate for its deficiency of lime and soda and to neutralise its too large amount of sulphide of calcium; for sodium nitrate may be used nitrates or chlorates of potash, lime, strontia, baryta, and so on, which will serve, albeit in a less degree, to convert the calcium sulphide into calcium sulphate, as oxidation ensues when the mixed slag and lime is burned in the shape of powder or bricks.

2,933.—EXTENSIBLE LADDERS: *A. Müller*.—At the back of the ladder is a cross-bar on to which the pivoted metal plates, to which are secured the back legs or supports of the ladder, the last-named parts being joined with links, whereof the common pivot works within a slot cut vertically in the cross-bar. With the extension of the ladder recesses on brackets take the plates, which then become locked with a pivoted catch to be turned down over the links; a cross-rod joins the brackets, which may have holding pins or recesses. For the employment of the steps of a folding ladder the back supports are rendered detachable, and one pivot of the main cross-bar will fit into a slot in one of the side brackets where a pivoted catch retains it in position.

2,938.—AN AUTOMATICAL MACHINE FOR SHARPENING CIRCULAR SAWS: *C. H. Clifton*.—A pivot which can be adjusted both horizontally and vertically with slides and screws holds the saw, across which a cam or crank upon a shaft feeds a grinding-disc that is carried upon the end of a swinging arm; two friction-discs—one of which a spring forces against the saw—feed the grinding-disc forwards; during the process of sharpening the saw is stopped from time to time through the action of a pawl which a lever forces aside out of the way; the pawl, upon its return, again stops the saw as it is being fed by the friction-discs; a stop upon the swinging arm, which impinges against a bell-crank lever, raises the grinding-disc at its stroke backwards, and a modified shape of the machine provides for a vertical raising of the pawl out of gear with the teeth of the saw, instead of its movement to one side.

2,964.—MOULDING OF PIPES, CONDUITS, &c.: *A. H. Howard*.—Pipes, conduits for electrical conductors, and similar goods are composed of a bituminous substance, which is moulded, when in a hot plastic or liquid condition, in a metal casing or around a skeleton of wire network or coil, which, together with the heated material, is placed within a closed mould; the mould is then rotated quickly in one direction, through centrifugal action, the material may become spread evenly. The mould consists of two parts joined together with wedges forced between the claws of rounded and hinged straps; the rounded and recessed ends of the tubes are connected by the insertion of a hot dish block of iron between their adjacent ends and the pressure of the pipes together after melted bitumen has been laid over the joint.

2,989.—BURNERS FOR GAS-STOVES: *R. Oehme*.—A gas-inlet, a conical rim turned inwards, and a shallow casing of metal with feet constitute the burner. Upon the rim is laid a cone-shaped ring, having two other rings above it, a middle disc, or plug, is laid upon the uppermost ring, being tightly screwed into the base with a screw and a key that fits two holes; notches cut in the upper edges of the rings, the central disc, and the outer rim form the gas-outlets for burning purposes.

2,996.—AN APPARATUS FOR USE IN DRYING, BURNING, AND SIMILAR FURNACES: *H. Hersfeld*.—For charging and discharging a drying-oven or furnace the goods are to be loaded upon the tray of a truck which runs upon rails into the oven, and when the truck has been pushed into the tray is lowered on to ledges with lever-worked cams; the tray is again lifted by the same means; screws, however, may be used for that purpose.

3,005.—TRAPS FOR GULLIES: *F. Staincliffe*.—For an improvement upon the contrivance specified in No. 4,528 of 1896 the inventor places the outlet on the side of the gully and fashions the trapping dish in a detachable form; he also adds a grating which is to be sprung into its place at the top of the gully, being made of a zig-zag spring of steel. Other modifications are available for use in stables and streets; in the latter instance he makes the trapping vessel rectangular in shape, and provides it with four supports.

MEETINGS.

FRIDAY, JUNE 14.
Edinburgh Architectural Association.—Annual excursion to Hexham and Durham.

SATURDAY, JUNE 15.
Architectural Association.—Summer visit to Godalming and District to view some works by Mr. Lutyns.
Edinburgh Architectural Association.—Annual excursion (concluded).

St. Paul's Ecclesiastical Society.—Visit to the Church of Sarraz. Train to Rickmansworth from Baker-street at 10.40 p.m.

MONDAY, JUNE 17.
Royal Institute of British Architects.—Professor W. R. Lethaby on "Education in Building." 8 p.m.

WEDNESDAY, JUNE 19.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

SATURDAY, JUNE 22.
British Institute of Certified Carpenters.—Visit to Hampton Court Palace. 3 p.m.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

May 30.—By I. FARLOW (at Gipsy Hill). Sydenham—2 and 3, Porthcaw-road, r. 4,375 By J. R. EVE & SON (at Ampthill). Ampthill, &c., Beds.—The Morris Estate, comprising about 600 ac. f. numerous 193, 25,182 May 31.—By E. HOLSWORTH (at Stoke Newington). Stamford Hill—68, Akkham-rd., ut. 66 yrs., g.r. 74, r. 604 By TYSER, GREENWOOD, & CRISER. Chiswick.—Burlington-lane, a plot of building land, f. 430 Acton Green—23 to 29 (odd), Cunningham-st., f. 1,490 June 3.—By BUNCH & DUKE Fulham—505 and 507, Fulham-rd., ut. 55 yrs., g.r. 24, r. 867 451 and 453, Fulham-rd., ut. 59 yrs., g.r. 154, r. 1,000 5 and 7, Maxwell-rd., ut. 50 yrs., g.r. nil, r. 454 37, Moore Park-rd., ut. 50 yrs., g.r. nil, r. 847 41 to 49 (odd), Moor Park-rd., ut. 55 yrs., g.r. nil, r. 217 Hackney—20 and 21, Gascoyne-rd., ut. 27 yrs., g.r. 114, 128, r. 847 Cricklewood—10 to 24 (even), Oak-grove, ut. 94 yrs., g.r. 581, 168 Stockwell—18 to 28 (even), Hubert-grove, ut. 73½ yrs., g.r. 43, 39 Harrow—13 to 15, Hendon-rd., f. 1, 2, 284 Catford—43 to 49 (odd), Creland-grove, ut. 62½ yrs., g.r. 167 By MAX & ROWLAND. Streatham.—Woodfield-av., Adelswick, ut. 54 yrs., g.r. 221, 95 By MESSRS. RUTTER. Peckham—9, 11, and 23, Howden-st., ut. 75½ yrs., g.r. 154 By FRED. VARLEY. Leytonstone—42 and 44, Park Grove-rd., ut. 83 yrs., g.r. 84 Horton—29 and 31, St. Andrew-st., ut. 22 yrs., g.r. 94, r. 954 Finsbury Park—6, Portland-rd., ut. 57 yrs., g.r. 121, 128, r. 703 Bloomsbury—47, Bloomsbury-sq., a profit rental of 270, for 21 yrs. Southwark—113 and 115, Borough High-st., area 2,790 ft., f. 1,574 By R. & J. R. MITCHELL (at Coekermaster). Bingham, Cumberland.—Beckhouse Estate, 80 a. 2 r. 16 p., f. 2,620 Hampstead—9, College-ter., ut. 50 yrs., g.r. 104, r. 904 Shooter's Hill, Kent.—Brent-rd., Downham and 13 a., f. 1,590 By HOLLIDAY & SPANGS. Plumstead Common, Kent.—13 to 15, Garland-st., ut. 47 yrs., g.r. 84, 115 Streatham—20, Madingley, f. 1, 454 By KING & LING. Hatfield Peverel, Essex.—London-rd., Springfield House and 8 a. 1 r. 25 p., f. 2,000 Maida Vale.—No. 24, Beaumont-st., 37 yrs., g.r. 734 By PEACOCK & FULLER. Harrow, Middlesex.—Gayton-rd., Brunswick House, f. 1,070 Hampstead-rd.—No. 219, f.g.r. 204, reversion in 61 yrs., 1,250 Regent's Park—102, Gloucester-rd., ut. 50 yrs., g.r. 61, f. 510 By RUTLEY, SON, & VINE. Camden Town—32 and 33, Georgiana-st., ut. 38 yrs., g.r. 62, 108 June 4.—By DERRIMAN & TAYLOR. Kenilworth—15, Lambeth-st., ut. 62 yrs., g.r. 61, 68 78, Castle-rd., ut. 62 yrs., g.r. 214 Forest Hill—83, Stanstead rd., f. r. 251

By WESTON & SONS. Brixton—34, 35, 41, 2, and 3, Eastlake-rd., ut. 63½ yrs., g.r. 254, r. 2024 24 to 32 (even), Luxor-st., ut. 63½ yrs., g.r. 354, r. 1867 77, Galesley-rd., ut. 71½ yrs., g.r. 74, 108, r. 454 By C. P. WHITFIELD. Mitcham, Surrey.—Tramway path (near two parcels of freehold land, 12 a., 1 r. 35 p., 100 sq. ft., f. 214, reversion in 60 yrs.) Iseworth, Middlesex.—Twickenham-rd., Beckbrook House, ut. 62 yrs., g.r. 84, r. 254 By BATE & CO. Hampstead—64, West End-lane, ut. 77 yrs., g.r. 254, r. 1304 Maida Vale.—50, Sutherland-avenue, ut. 62 yrs., g.r. 111, r. 602 By HUNBER & FELTON (at Watford). Watford, Herts.—28 and 29, Brickford-rd., ut. 61 yrs., g.r. 124, r. 602 Brixton-rd., enclosure of building land, f. 1,050 2, 4, and 6, St. James-rd., f. 1,050 49, Liverpool-rd., f. 1,050 Bushey, Herts.—20 and 22, Capel-rd., f. 700 By G. E. SWOBER & SONS (at Hitchin). Ardley, &c., Herts.—Hare-st. Farm, 70 acres, f. 1,010 By A. J. DUBROWS (at Ashford). Egerton, Kent.—New Green Farm, 13 a. 1 r. 10 p., f. 500 Little Chart, Kent.—Five cottages and o a. 2 r. 28 p., f. 245 Shadwell, Kent.—Southwick houses, cottages and 5 a. 1 r. 20 p., f. 245 By MORRIS & PLACE (at Nottingham). Greasley, Notts.—The Ribington Estate, 81 a., f. 4,500 By HOLT & CO. (at Leeds). Leeds—35 to 95 (odd), Park-lane, area 1,795 yds., f. 18,000 Addingham, Yorks.—Turner-lane Farm, 46 a. 2 r. 28 p., f. 1,430 By J. & W. JOHNSON (at Gosport). Victoria Park.—Wick-rd., the Elephant and Castle p. 48, ut. 27 yrs., r. 954 with goodwill Wm. Rother (at Mason's Hall Tavern). Strand.—The Grosvenor and the Temple Bar Restaurant, ut. 68 yrs., r. 9004, with goodwill Finsbury.—Paul-st., the Crown and Anchor p. 4; also 66, Leonard-st., ut. 72 yrs., r. 784, with goodwill By W. BROWN & CO. (at Amersham). Chesham Bois, Bucks.—The Common, two enclosures of 12 a. 1 r. 10 p., f. 1,160 New-rd., an enclosure, 2 a. 2 r. 23 p., f. 498 The Common, a building site, 1 a. 1 r. 24 p., f. 498 Santwick, Wilts.—Southwick Court Farm, 180 a. 3 r. 7 p., f. 8,000 Two allotments, 5 a. 3 r. 19 p., f. 370 June 5.—By FOLEY, SON, & MUNDY (at Nelskham). Melksham, Wilts.—Woodrow Farm, 110 a. 0 r. 24 p., f. 3,400 By MESSRS. BOLAN (at Norwich). Norwich.—Thorpe Hamlet, the Lane and 1 a. 0 r. 12 p., f. 2,050 47, 49, 51, and 54, Thorpe-rd., f. r. 1154 By WALTER PEAKSON (at Pickering). Pickering, Yorks.—Enclosure of land, 2 a. 2 r. 20 p., f. 800 A freehold house and 21 p. 470 Ainstay, Yorks.—Two freehold houses and 2 a. 0 r. 12 p., f. 400 Wretton, Yorks.—Farmhouse and 17 a. 1 r. 3 p., f. 600 Cropton, Yorks.—Farmhouse and 26 a. 2 r. 31 p., f. 515 Enclosures of land, 9 a. 3 r. 19 p., f. 95 June 6.—By G. H. BROWN. Pimlico.—26, Cumberland-st., and 33, Clarendon-st., ut. 52½ yrs., g.r. 104, r. 934 By G. F. FRANCIS. Hackney—85, King Edward-rd., ut. 38 yrs., g.r. 61, r. 364 Chelsea.—10, Smith-st., f. r. 602 By G. G. LOUGHRAN, SON, & CO. Belgrave—50, Champson-rd., ut. 60, Edinburg-mews, ut. 22½ yrs., g.r. 24, r. 2604 North Kensington.—23, Egerton-cres., ut. 26 yrs., g.r. &c., 174, r. 1054 By G. C. F. MORGAN. Whitechapel-rd.—Nos. 71, 72, and 75, c. r. 2304 St. George's East—79 to 91 (odd), Lower Chapman-st., f. r. 1984 Mile End—21 and 23, Morgan-st., ut. 38 yrs., g.r. 74, 108, r. 744 Bow—14, Caxton-st., ut. 50 yrs., g.r. 64, r. 384 Stepney—90 and 92, Nelson-st., ut. 17 yrs., g.r. 204 25, Bedford-st., ut. 14 yrs., g.r. 121 62, Oxford-st., ut. 14½ yrs., g.r. 54 138 and 140, Oxford-st., ut. 33 yrs., g.r. 104 137, 925, and 143, Oxford-st. and 117 and 119, Jubilee-st., ut. 32 yrs., g.r. 24 Spitalfields—12, Teater-st. and 13, Shepherd-st., f. 1,300 Stoke Newington—16, St. Kilda-rd., ut. 74 yrs., g.r. 74, r. 602 By NEWBORN, EDWARDS, & SHEPHERD. Somers Town—6, 17, and 8, Charrington-st., ut. 30 yrs., g.r. 164, 108, r. 1354 Canbury—29, Compton-rd., ut. 44 yrs., g.r. nil, r. 602 Holloway—149 and 115, Hungerford-rd., ut. 59 yrs., g.r. 124, r. 1054 By BRIMSON & SONS. Folkestone, Kent.—139, Dover-rd., ut. 42 yrs., g.r. 114, 58, r. 1004 Willesden.—Hyth-rd., Westley Works, area 2 a., ut. 92½ yrs., g.r. 104, r. 2504 Bow—4, 6, and 8, Turner-st., ut. 62 yrs., g.r. 154 148, Turner-rd., ut. 60 yrs., g.r. 54, r. 404 Walthamstow—4 to 52 (even) and 50A, Spruce Hill-rd., f. 2,125 St. John's-rd., two plots of building land, f. 120 Woodford.—West-grove, a plot of building land, f. 335 Chelsea—8 and 9, Christchurch-ter., ut. 50 yrs., g.r. 124, r. 704 Lee—3, Church-st., f. r. 304 New Kent-rd.—No. 208A, ut. 28½ yrs., g.r. 94, r. 354 Peckham—2, Peckham Rise, ut. 33½ yrs., g.r. 61, 108, r. 604

Wimbledon—26, Soutley-rd., f. r. 454 By WILTSHIRE & THURGOOD. Catford—2, Barnet-road, ut. 75 yrs., g.r. 104, 108, r. 404 Lewisham—143, 145, and 147, High-st., ut. 37 yrs., g.r. 254, r. 1304 Forest Hill—57, Hounslow-rd., ut. 75 yrs., g.r. 54, r. 274, 108 By E. WOOD. Clapham—1150, Leath-wal-ter, ut. 83 yrs., g.r. 104 Battersea—29, Hasnet-rd., ut. 68 yrs., g.r. 84, r. 554 12, Savona-place, f. 205 By A. ROBERTSON (at Camberwell). Camberwell—44, Vicarage-rd., ut. 49 yrs., g.r. 84, r. 554 Kennington—38 and 48, Shursted-st., ut. 63 yrs., g.r. 124, r. 744 Brixton—70, Acre-lane, ut. 73 yrs., g.r. 121, 128, r. 504 Dulwich.—Green-lanes, Infallien, ut. 67 yrs., g.r. 34, 188, r. 654 Hampton Hill, Middlesex.—High-rd., The Hermitage, f. r. 524 By PERCIVAL HODSON. Finsbury Park—12, Adolphus-rd., ut. 72 yrs., g.r. 104, 124, r. 554 Gray's Inn-rd.—16, Swinton-st., ut. 40 yrs., g.r. 84, r. 444 By JONES, SON, & DAY. Bermondsey.—Southwark Park-rd., f.g.r. 104, reversion in 30 yrs. 330 Limehouse.—Maroon-st., f.g.r. 204, reversion in 34 yrs. 620 3, Three Collet-st., f. r. 244 Whitechapel—129 and 131, Bedford-st., f. r. 454, 128 Hoxton—3, 4, and 5, Levering-p-l., f. 410 Silver-street—445, North Woolwich-rd., f. r. 364 Edmonton—26, Gordon-rd., r. 204, also Moor-mouth-rd., two plots of building land, f. 600 Walthamstow.—Copper Mill-lane, plot of building land, f. 135 Poplar.—Orient-st., the Oriental Tavern, &c., f.g.r. 134, 138, reversion in 56 yrs. 595 East Ham—107, Barking-rd., f. r. 454 Limehouse.—39, Maroon-st., f. r. 194 Wanstead.—Grove Park, five plots of building land, f. 200 By F. J. BISLEY & SONS. Bermondsey—125, Alcock-rd., ut. 25½ yrs., g.r. 47, 78, 104 1, 3, and 5, Dockley-rd., ut. 33½ yrs., g.r. 157, 108 159, Fort-rd., f. 525 Denford—18, Chipley-st., ut. 59 yrs., g.r. 54 13, Croft-rd., ut. 64 yrs., g.r. 204 Camberwell—86, Picton-st. and 2, Cork-st., ut. 98 yrs., g.r. 74 4, 6, and 8, Conk-st., ut. 98 yrs., g.r. 104, 108 By BEARD & SON. Bayswater.—Monmouth-rd., f.g.r. 154, reversion in 49 yrs. 655 New Malden, Surrey—4 and 5, Wellington-ter., f.g.r. 62, 128 Lewisham—3, Fordyce-rd., ut. 80 yrs., g.r. 54, 108, r. 204 By W. A. BLAKESTON. Harrow, Middlesex.—3 and 5, Roxborough-pk-rd., f. r. 1304 Battersea—2 and 4, Granfield-st., ut. 80 yrs., g.r. 84 Brixton.—Chauce-rd., Chauce Cottage, with yard and stable, ut. 67 yrs., g.r. 44, 108 By P. J. DIXON & SON. Bow—54, Campbell-rd., ut. 61 yrs., g.r. 54 By SALTER, REE, & CO. Kentish Town—54, Woods-road, ut. 61 yrs., g.r. 74, r. 384 Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for estimated rental; ut. for unexpired term; p. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.
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PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—fact which should be remembered by those who make use of this information.

Hard Stocks	14 0	per 1,000 alongside, in river.
Rough Stocks and		
Griddles	1 11 0	" "
Facing Stocks	2 12 0	" "
Shippers	2 8 0	" "
Flettons	1 8 0	" at railway depot.
Red Wire Cutts	1 14 0	" "
Best Furcham Red	3 11 0	" "
Best Red Pressed		
Ruabon Facing	5 5 0	" "
Best Blue Pressed		
Starbricks	4 4 6	" "
Do., Bullnose	4 9 0	" "
Best Starbricks		
Fire Bricks	4 2 6	" "
Quartz Bricks		
Best White and Ivory Glazed		
Stretchers	13 0 0	" "
Stairs	12 0 0	" "
Quoins, Bullnose, and Flats	17 0 0	" "
Double Stretchers	19 0 0	" "
Double Headers	16 0 0	" "
One Side and two Ends	19 0 0	" "
Two Sides and one End		
End	20 0 0	" "
Splays, Chamfered, Squints	20 0 0	" "
Best Dipped Salt Glazed Stretchers and Headers	17 0 0	" "

[See also page 595.]

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Bridge Widening.....	Hamilton (N.B.) Corporation.....	15 guineas and 10 guineas.....	June 30
*Laying out Winter Garden.....	Penzance Corporation.....	21 <i>l.</i> and 10 <i>l.</i> 10 <i>s.</i>	Sept. 1

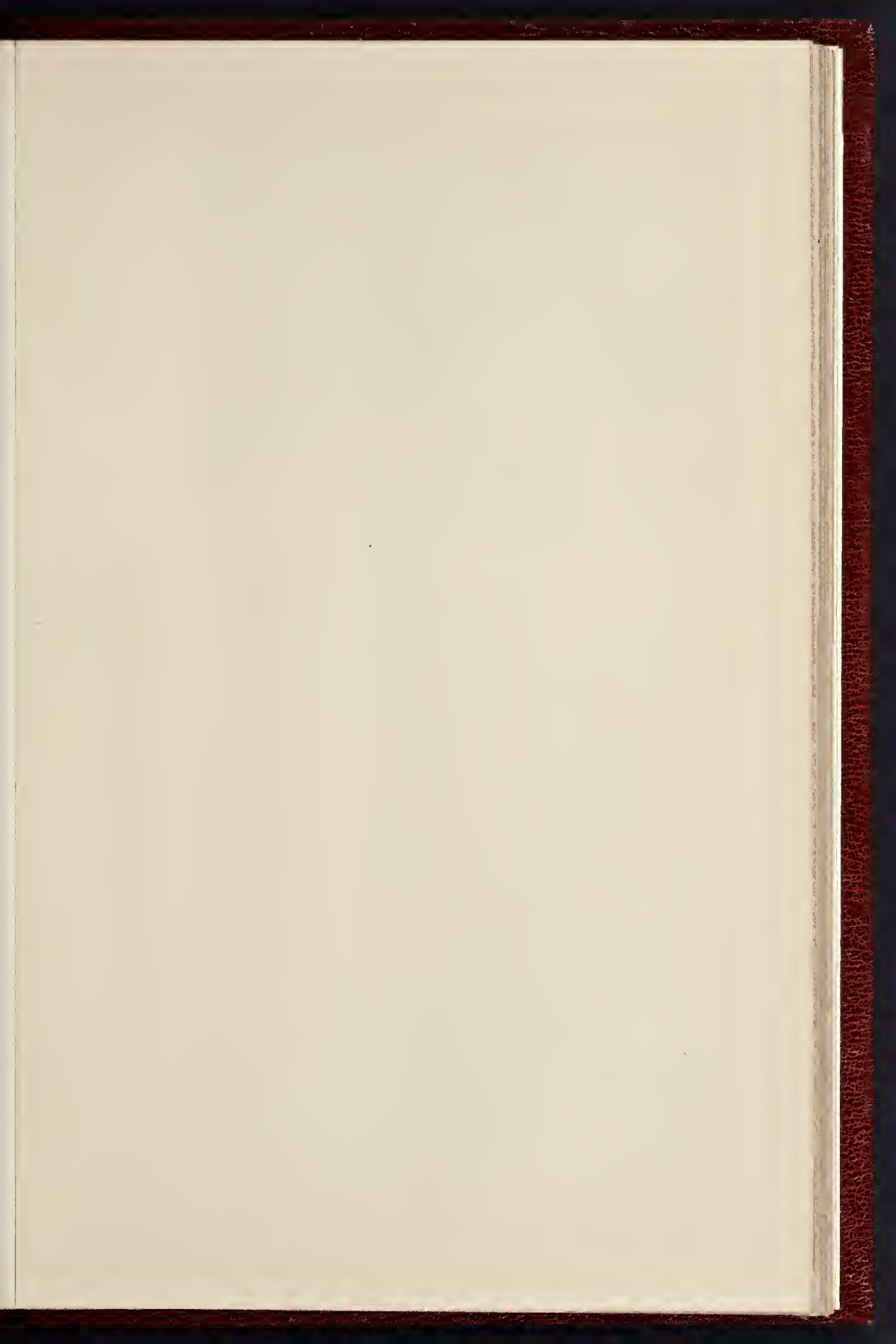
CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Draining, Kerbing, &c.....	Hendon U.D.C.....	Engineer, Public Offices, Hendon, N.W.....	June 17
Offices and Tea Rooms, Kirkcaldy.....	Leeds Corporation.....	City Engineer, Municipal Buildings, Leeds.....	do.
Waterworks, Much Wenlock, Salop.....	Madeley & Brosley Water Comte.....	Mr. Stooke, Civil Engineer, Severn Villas, Shrewsbury.....	do.
Seven Houses, Osborne-street, Barnsley.....	L. & N. W. Railway Company.....	Wade & Turner, Engineers, 10, Pitt-street, Barnsley.....	June 18
Eighty Houses, Bradford, Manchester.....	Edinburgh Corporation.....	Estate Offices, Exchange Station, Manchester.....	do.
Additions to Public Library.....	Rotherham Corporation.....	R. Morham, Architect, City Chambers, Edinburgh.....	do.
Brick Tank, &c.....	Bradford-on-Avon U.D.C.....	H. H. Copnall, Town Hall, Rotherham.....	do.
Pumping Station, &c.....	Longtown Agricultural Society.....	S. Howard, Surveyor, Town Hall, Bradford-on-Avon.....	do.
Farmhouse, Carlogas, near St. Columb.....	Nelson Corporation.....	J. Smith, Churchtown, Graupound-road, Cornwall.....	do.
Showyard Buildings, Longtown, near Carlisle.....	Dover Hospital.....	J. S. Hewitson, Randalinton, Lom-town.....	do.
Electric Light Station.....	Rev. J. J. Lewis.....	B. Ball, Civil Engineer, Town Hall, Nelson.....	do.
*Alterations, &c., to Dover Hospital.....	North-Eastern Railway Company.....	See Advertisement.....	June 19
Church, Tynte, Penrhyn-waiber, Wales.....	Plymouth Corporation.....	Rev. W. Johnston, The Manse, Holywell Green.....	do.
Additions to Club Buildings, Crossland Moor.....	Hove Corporation.....	E. M. Bruce Vaughan, Architect, Cardiff.....	do.
Stables, &c., Hexham.....	Dagenham (Essex) School Board.....	J. Berry, Architect, 9, Queen-street, Huddersfield.....	do.
Stabling, Stores, &c., New Mills, Norwich.....	Mr. W. A. Parker.....	Harrington & Ley, Architects, 65, Bishopsgate-street, Without.....	do.
Lavatory, The Barbican.....	Deal U.D.C.....	A. E. Collins, Civil Engineer, Guildhall, Norwich.....	do.
*Sewer Works.....	H. Perkin's School Governors.....	J. Paton, Engineer, Town Hall, Plymouth.....	do.
Ten Labourers' Dwellings.....	Sutton Coldfield Corporation.....	Borough Surveyor, Town Hall, Hove.....	do.
School, Marsh Green.....	Edinburgh Corporation.....	J. O'Neill, Council Offices, North Brunswick-street, Dublin.....	do.
Villas, Lamley-avenue, Skegness.....	Edinburgh Corporation.....	Dagenham (Essex) School Board.....	do.
Additions to Wesleyan Church, Newton Abbot.....	Edinburgh Corporation.....	Mr. W. A. Parker.....	do.
Depot Buildings, West-street.....	Edinburgh Corporation.....	W. H. Bridges, Architect, Skegness.....	June 20
School and House, Barrow-on-Soar.....	Edinburgh Corporation.....	H. J. Snell, Architect, 11, The Crescent, Plymouth.....	do.
*Stone, Kerb, &c.....	Edinburgh Corporation.....	T. C. Goller, Surveyor, 23, Queen-street, Deal.....	do.
Pipe Sewers, &c.....	Edinburgh Corporation.....	F. Massie, Civil Engineer, Architects, Mill-street, Loughborough.....	do.
Church and Schools, Basinstoke.....	Edinburgh Corporation.....	Borough Surveyor, Clatterton House, Kingston-on-Thames.....	do.
Additions to Ardgyle House, Alva, N.B.....	Edinburgh Corporation.....	W. A. H. Clary, Civil Engineer, Town Hall, Sutton Coldfield.....	June 21
Villa, Wyke-road, Gillingham.....	Edinburgh Corporation.....	T. E. Davidson, Architect, 68, Aldersgate-street, E.C.....	do.
Two Villas, Mount Charles, St. Anstell.....	Edinburgh Corporation.....	Reid & Witter, Architects, Elgin.....	do.
Cottage, Fenton-ladock, Cornwall.....	Edinburgh Corporation.....	R. J. Vivyan, Moorland-road, St. Austell.....	do.
Main Sewers, &c., at Workhouse.....	Edinburgh Corporation.....	G. Gow, Iregathan Office, Truro.....	June 22
Alterations, &c., at Workhouse.....	Edinburgh Corporation.....	F. Massie, Civil Engineer, Telfey House, Wakefield.....	do.
Additions to Chapel, Beilnong, Wales.....	Edinburgh Corporation.....	J. L. Donnelly, Architect, Omagh.....	do.
Building Work at several Schools.....	Edinburgh Corporation.....	E. Vivian Jones, Architect, Hengoed, Wales.....	do.
Post Office and House, Leint.....	Edinburgh Corporation.....	Mr. Wilson, 3, Queen-street, Edinburgh.....	do.
Manse, Park-avenue, Oswestry.....	Edinburgh Corporation.....	W. J. Rubery, Post Office, Canonstown, Cornwall.....	do.
Water Mains, Altham, &c.....	Edinburgh Corporation.....	S. Edmondson, Surveyor, 18, Nicholas-street, Burnley.....	do.
*Tax Paying.....	Edinburgh Corporation.....	G. Pritchard, 15, Cross-street, Gwastrey.....	do.
*School Buildings.....	Edinburgh Corporation.....	S. Jackson, Architect, 65, Fenchurch-street, E.C.....	June 21
Drainage Works, West End, Southampton.....	Edinburgh Corporation.....	E. L. Curtis, 120, London Wall, E.C.....	do.
Drainage Works, Chipping Ongar.....	Edinburgh Corporation.....	Bateman, Son & Gutteridge, Architects, 9, Portland-st., Southampton.....	do.
Additions, &c., to 142, St. Owen-street, Hereford.....	Edinburgh Corporation.....	W. N. Jarvis, Surveyor, Council House, Ongar.....	do.
Eleven Houses, Fountain-street, Morley.....	Edinburgh Corporation.....	E. G. Davies, Architect, 6, St. John-street, Hereford.....	do.
Street Works, Front-street, &c., Tantobie.....	Edinburgh Corporation.....	W. E. Putman, Civil Engineer, Town Hall, Morley.....	do.
Stables for 80 Horses.....	Edinburgh Corporation.....	R. Henlop, Surveyor, Burnopfield, R.S.O.....	June 25
Street Works, Wynd-street.....	Edinburgh Corporation.....	Fairbank & Wall, Architects, Bank-street, Bradford.....	do.
Concrete Paving, Flags, &c.....	Edinburgh Corporation.....	W. Gibson, Surveyor, Amble.....	do.
Yorkshire Stone Flags, Kerbs, &c.....	Edinburgh Corporation.....	W. C. Eldowes, Surveyor, The Square, Shrewsbury.....	do.
*Grault, &c.....	Edinburgh Corporation.....	do.	do.
*Road Making, &c., Works.....	Edinburgh Corporation.....	See Advertisement.....	do.
Additions to Electric Lighting Station.....	Edinburgh Corporation.....	Engineer, Public Offices, Dyne-road, Kilburn.....	do.
Public Baths, Reginald-street.....	Edinburgh Corporation.....	J. W. Coekrill, Civil Engineer, Town Hall, Great Yarmouth.....	do.
*Drainage, &c.....	Edinburgh Corporation.....	J. Ward, Borough Surveyor, Babington-lane, Derby.....	June 26
*Granite, &c.....	Edinburgh Corporation.....	See Advertisement.....	do.
*Iron Railings.....	Edinburgh Corporation.....	do.	do.
*Dwelling-Houses.....	Edinburgh Corporation.....	do.	do.
School.....	Edinburgh Corporation.....	Borough Engineer, Town Hall, Brighton.....	do.
*Sewerage Works.....	Edinburgh Corporation.....	City Engineer, Lown Hall, Chester.....	July 2
Shop and House, Talbot-street, Maesteg.....	Edinburgh Corporation.....	Owner, 55, Commercial-street, Maesteg.....	July 8
School Works, Queen's Walk.....	Edinburgh Corporation.....	A. N. Bromley, Architect, Queen-street, Nottingham.....	No date
Warehouse, Stores, &c., Laisteryke, Bradford.....	Edinburgh Corporation.....	Kendal & Bakes, Architects, Victoria-square, Leeds.....	do.
Freemasons' Hall, Abbeygate-street, Colchester.....	Edinburgh Corporation.....	C. E. Butcher, Architect, 3, Queen-street, Colchester.....	do.
Additions, &c., Congregational Chapel, Gwersyllt.....	Edinburgh Corporation.....	J. Gummow, Architect, Egerton-street, Wrexham.....	do.
Waterworks, Calkoot Moor, Mon.....	Edinburgh Corporation.....	T. Rees, Civil Engineer, Corn Exchange Chambers, Newport.....	do.
Reservoir, Eccleshill, Bradford.....	Edinburgh Corporation.....	Kendal & Bakes, Architects, Leeds.....	do.
*Extensions to County Asylum Buildings.....	Edinburgh Corporation.....	See Advertisement.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Road Foreman.....	West Ham Borough Council.....	200 <i>l.</i> per annum.....	June 18
*Clerk of Works.....	Harrogate Corporation.....	3 <i>l.</i> 10 <i>s.</i> per week.....	June 21
*Assistant.....	Hull Corporation.....	10 <i>l.</i> per annum.....	June 21
*Lecturer in Building Construction.....	Norwich Technical Institute.....	150 <i>l.</i> per annum.....	June 22
*Road Foreman.....	Slough U.D.C.....	30 <i>s.</i> per week.....	do.
*Assistant Sanitary Inspector.....	Willesden U.D.C.....	100 <i>l.</i> per annum.....	June 25
*Surveyor and Inspector of Nuisances.....	Leatherhead U.D.C.....	250 <i>l.</i> per annum.....	July 1
*Clerk of Works.....	See Advertisement.....	do.	do.
*Clerk of Works.....	Cressing School Board.....	See Advertisement.....	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.





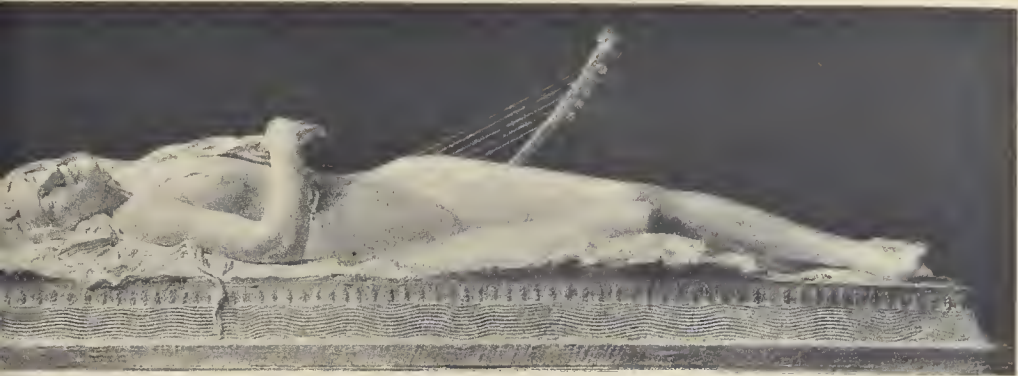
"SOLITUDE" (J. ADOLPHE MÉCRET).



"PANDORA" (MISS L. GWENDOLEN WILLIAMS).



UPPER PART OF A CABINET IN OAK



"AWAKENING" (MR. OLIVER WHEATLEY).



MARK ROGERS, JUN.



"L'INCONNUE" (MR. RICHARD GARBE).

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





"May Morning"—Relief for Decoration of a Fireplace. Miss Edith Maryon, Sculptor.

cramped attitude in a chair, which latter is a good piece of design; the figure has not the dignity either of design or expression which the subject seems to call for; but it is at all events not commonplace. Mr. Pegram's monument to Mme. Michallis seems to have been inspired by some of the monument designs of Chapu and Mercié; it shows a simple but well-designed flat stele or tombstone, in the head of which is a medallion portrait of the deceased person commemorated, while beneath is a mourning figure, life size and draped, in high relief on the stele as a ground. There is pathetic intention in this, but in a sculptural sense the figure is somewhat commonplace in design, and appears more so from the rather pronounced alto-relief in which it is treated. A French sculptor would almost certainly have kept it in low relief, perhaps just emphasising the head by raising it further from the ground; such a treatment would have tended to give a refinement of sculptural effect which the work as it stands seems to lack; it is altogether too *prononcé* and too crude in its large rounded forms.

In Mr. Arthur Walker's recumbent group, "Sleep," representing a mother and child, the sleeping infant is natural and touching in expression; the attitude of the figure of the mother, with legs drawn up, is rather awkward and undecorative in line, but the work as a whole is one to be regarded with interest, and is in a very good style, free in execution and not over-finished. Mr. Fehr's "Hesitation," a bronze figure of a female tempted by "Ambition's crown," yet shrinking from putting it on her head since it is "fraught with pain," is one of those symbolical subjects which are peculiarly suitable for sculpture, but the interpretation is a little too matter-of-fact and prosaic—the figure holding up the crown and twisting her head away from it as if it would sting, looks so like a shrinking from bodily pain, besides resulting in an uncomfortable and strained attitude; the *motif* of the work should surely have been conveyed through the expression of the face rather than through muscular movement. Mr. Lucchesi's "The Victory of Peace," to be erected in marble in a Park at Auckland, is a half-draped female figure of fine lines clasping a dove on her bosom but also holding in the other hand a drawn sword, so that the allegory is rather confused, and one can only regard the work as satisfactory from a decorative point of view. Mr. Alfred Turner's short-skirted and robust

"Fisher Girl," one of a pair to be placed in Fishmongers' hall, is not decorative, but is a good healthy symbol of open-air physical toil. Mr. Thornycroft's "Dean Colet, Founder of St. Paul's School," with a scholar kneeling on each side of him, is the group to be placed under the not very happily designed metal canopy of which the drawing is shown in the architectural room. The sculptor is here helped, in treating the principal figure, by the flowing costume which is not of to-day, and which therefore has a certain sculptural and abstract effect; Colet's thin and ascetic head is finely treated, and the innocent and unworn faces of the boys make an effective contrast with his figure. The last thing we have to mention in the octagon room is the nude marble figure "Solitude," by a French sculptor, M. Mégrét, of which an illustration will be found in one of the plates in this issue. The figure has not the sentiment implied in the title; indeed, any name such as "Nymph" or "Etude" would do equally well for it; but it has the merit of being an exceedingly pretty and well-modelled figure, which would have had more justice done to it by a central position, as it seems satisfactory in line from all points of view.

In the Lecture-room we may first notice M. Schenck's two alto-relief subjects, "Summer" and "Autumn," which are placed against the wall over the door, and of which, as they are in a special sense architectural sculpture, being intended for the decoration of a building, we have given illustrations on a large scale (see lithograph plates). As will be seen, they are figures composed specially to fill a space of peculiar shape, and also to act as corbels. This latter function explains and justifies their high relief; otherwise we prefer decorative sculpture on a building to be kept in low relief, in order to be duly subordinate to the architectural lines of the building.

The works placed in the centre of the floor in the lecture-room are at all events curiously diverse in style and motive. In the centre of the room is the bronze of Mr. Swan's "Puma and Macaw," of which a plaster model was in a former exhibition. As a representation of animal form and action this is a remarkably truthful and spirited work; what one questions is whether the result is really worth the ability and pains expended on it; for animal sculpture can never take anything but a secondary rank in the productions of the art; it lacks the

higher interest of intellectual meaning and expression. Mr. Simonds's curious design for a fountain, called "Song and Dance," is original and piquant enough; it is based on a triangle plan, and consists of a gilded nude figure placed aloft in the centre and playing on an old-fashioned bow instrument, while three flamingoes dance solemnly at the three angles of the triangle. No doubt the subject arose from a wish to work into sculpture the peculiar form and movement of the flamingo, an experiment which was worth trying, though one fails to see what connexion the birds have with a fountain. It is a graceful and original fancy, however; we should have liked it better if the centre pedestal had presented a formal design and not a piece of naturalistic rockwork; and there is nothing to show whence the water flows, an important detail in a fountain, and which should always form a point in the design. Mr. Frampton's "Edward VI." is a realistic costume statue for Giggleswick School, with the foundation of which we presume the young King had some connexion, and which is intended to represent him in his habit as he lived, with the stiff frock covered with embroidery. For a school this is the right thing, as it gives the boys a correct historical idea of the person and dress of a historical personage, and the sculptor has contrived to impart a good deal of individual character to the head; it cannot be said, however, that this is a kind of work which is interesting as sculpture. Mr. Wheatley's recumbent figure "Awakening," of which a small illustration will be found in one of our plates, is a work of considerable interest; it represents a nude female figure, who by the design of the small harp by her side and of the ornament on her forehead is to be classified as Egyptian, though there is nothing in her physiognomy to suggest that nationality; she is just awakening with a smile, her disordered hair partly covering one side of the face; the figure, in its lax attitude of repose, is very well modelled, and there is something very pleasing about the whole work, though it is not conceived in a very serious spirit.

Mr. Reynolds-Stephens's "Castles in the Air" and Mr. Onslow Ford's "Glory to the Dead," which are placed symmetrically on opposite sides of the room, may in one sense be classed together, as they both represent that kind of work which is as much decorative as purely sculptural; both are small bronze figures on specially

treated pedestals. In "Castles in the Air" the figure of a young girl with a book across her knee, not reading but dreaming, and with the right hand slightly raised in a very pretty and natural action, belongs essentially to real life; the pedestal is symbolical, the projection which forms the cap being decorated with little projecting turrets each with a bit of ruby glass in the top; the "castle" idea is again symbolised in the crowning ornament of the plaque which forms a background to the figure. Mr. Ford's work, though as we said, it belongs to the same class, is a far more delicate and refined production; the nude figure holding the wreath and torch is of exquisite grace and finish; the bronze pedestal which forms her immediate support is surrounded by little terminal figures of winged children, and small and delicately executed emblems—hearts, serpents, &c. This stands on a well-designed marble pedestal with fluted pilaster-like features which are stopped at the foot by acanthus leaves. As an *objet d'art* with a symbolical intent the whole is charming, but is it quite equal to the serious thought suggested by the title? When one thinks of Mercie's "Gloria Victis" in the court of the Paris Hôtel de Ville, one feels this to be rather small in comparison, and that not only in the sense of material dimensions.

Mr. Brock's bust of Queen Victoria, which stands between the two last-named works, is a masterly piece of portraiture in marble-cutting, bold and broad in execution and exceedingly dignified in character. Mr. Armstead's small-scale marble figure "Remorse," a woman running headlong down some steps with a woeful expression and attitude, the head and body thrown forward and the hands clasped convulsively, is pathetic in expression but rather violent in movement for sculpture. Mr. Colton's "The Wavelet," a gilt figure of a young girl supposed to be looking down on a stream, is clever and original, like all his work, but not beautiful, and has hardly character or point enough to atone for the absence of beauty.

Of the works placed round the walls there are as usual a good many busts, some of no interest, others which are of value either as characteristic portraits or as ideal suggestions. Among the latter class are two charming works by Miss Gwendolen Williams: "Doris," a head oddly mounted on a narrow pedestal decorated with striated lines, and "Pandora," a more important work of which we give an illustration. This is rather too *genre* a treatment of a Greek legend, but the bright and joyous expression of the head, and Pandora's obviously happy unconsciousness as to the nature of the uncanny things she is letting out of the casket, give it a point and piquancy more than arises from mere modelling. Mr. Richard Garbe's "L'Inconnue" is another imaginary head, white marble on a veined marble base, of which we give an illustration, and which is noticeable both for its fine expression and for its style of execution. Among portrait busts may be specially mentioned Mr. Goscombe John's marble bust of a lady; Mr. Hope-Pinker's low relief medallion portrait of the late J. J. Tayler, in a small architectural frame of green marble, and Mr. Onslow Ford's medallion bas-relief of Lady Elliott Drake, framed in carved wood. Mr. Goscombe John's colossal bronze

seated statue of the late Duke of Devonshire is a dignified work of this class, which, as before observed, is we suppose inevitable, but which can hardly make any sculptor happy.

Mr. Sargent appears this year as a sculptor, with a life-size crucifixion group, or rather a crucifix on a large scale, we presume intended for a Catholic place of worship, or a private oratory. The suggestion of the blood streaming from the outstretched hands into a cup held up by a figure at each side is to our thinking most painful and repellent, though we presume there are people of morbid religious excitability to whom it appeals. As a matter of design, the grouping of the two subsidiary figures with the Christ, to whom they are as it were connected by a band of drapery which winds round their figures and round His, is very fine, and the contrast of the lines of these figures and the strongly-marked vertical lines of the cross and the central figure is in a decorative sense very effective. Nevertheless, it is a thing we should never wish to see again. Mr. F. Lynn Jenkins's metal and ivory frieze for the vestibule at Lloyd's, which hangs below this, is a very clever and effective piece of work in which the associations of Lloyd's with sea and ships are symbolised in a decorative manner by the suggestion of ships and waves and clouds, with no kind of naturalism; the small alto-relief figures which are introduced at the salient points of the design are expressive and well designed. Among other decorative work in the Lecture-room is Mr. Mark Rogers's upper part of a cabinet in oak, of which we give an illustration; Mr. F. H. Steele's "Design for a Casket" in silver, which has the merit of avoiding that eccentricity of line and detail which seems too much an object in recent silver design, but for a casket it is perhaps a little too decidedly architectural in character; and Mr. Onslow Whiting's board of bell-pushes, finger-plates, &c., in which the figure is gracefully worked into some of the designs. M. Clovis Delacour's Andromeda statuette in ivory, with a bronze dragon, and waves of alabaster, is well done after its way, but is a kind of work we do not desire to see encouraged; it savours more of the "article de Paris" than of the art of sculpture. On the other hand, Miss Emmeline Halse's three little alto-reliefs of babies, in bronze, a small and very unpretending work, is by no means to be passed over; it is very clever and humorous. We should also mention the spirited panel in relief by another lady, Miss Edith Maryon, called "May Morning," and intended as a portion of the decoration of a fireplace. Of this we give an illustration from a small photograph sent to us by the artist; too small unfortunately to do justice to the work.

Although we have seen better sculpture years at the Royal Academy than this one, it cannot be denied that the proportion of good work to bad and indifferent is much higher in the sculpture galleries than among those devoted to painting.

NOTES.

The Report of the Council of the City and Guilds of London Institute, dated April of the present year, draws attention (in the special Report of the Principal, Professor

Sylvanus Thompson) to the necessity for carrying out the completion of the College buildings first suggested in the Report of 1884. Plans were prepared by Mr. Robins in 1887 for additions to include an engineering drawing office, a library, reading room, waiting rooms and lunch room, and the Institute is now in possession of the site for which these additions were designed. As Professor Thompson observes, if the need for these additions existed sixteen years ago, it has certainly not diminished since. Mr. Sparkes's Report of the art work is very encouraging, especially as showing the after results of the training, for it appears that at the Paris Exhibition of last year, sculptors who were former students at the Institute obtained six of the English and Colonial awards for sculpture, viz.: one out of three Grand Prix awarded, two gold medals out of five, and three silver medals out of eight awarded. In the Art Department, we are told, the enamelling class is doing good work under the superintendence of Mr. Fisher, than whom there could not be a more competent instructor.

WE are glad to be able to announce that the resolution to "fluate" the Poultry Cross at Salisbury, which would have involved the initiatory process of scraping off all the lichen and getting a raw surface, was formally rescinded at the meeting of the Salisbury Town Council last week on the motion of Mr. Haskins, who made a very sensible speech on the occasion, and quoted in support the opinion of the Secretary of the Society of Antiquaries, Mr. Read. Of course, as we pointed out in a former reference to the subject, (page 336 *ante*), the Poultry Cross was so much restored half a century ago that it has ceased to be much of a genuine relic, though some of the old stones were worked up in the restoration. But as the portions then new have now acquired a picturesque weathering, this at least might as well be left.

At a special court of the governors held on June 5, it was announced that the building of the new isolation block (towards which an anonymous donor gave 20,000*l.*) is now practically completed. The new buildings, together with the new pathological department and *post mortem* room, have been erected after the plans and designs of Mr. Rowland Plumbe, who has been engaged during some years past as architect for extensive improvements and additions at the hospital. The governors propose to expend a total sum of about 250,000*l.* during the next four years, of which amount they will devote 60,000*l.* to the new block fronting White-chapel-road; for the Jews' wards they set aside 10,000*l.* contributed by Mr. Edward L. Raphael; for a new out-patients' department, 60,000*l.*; laundry, 15,000*l.*; alterations of the interior, 20,000*l.*, and a children's ward, 7,000*l.* Mr. Rowland Plumbe's work comprises the block, opened on June 26, 1891, which contains an operating theatre, a theatre for clinical instruction, students' rooms and lavatories, nurses' rooms, storerooms, &c.; the recent remodelling of the sanitary arrangements, by the recommendation of Dr. Louis Parkes; an extension of the Nursing Home (1895); and the freezing chamber. The hospital was originally established in 1740, as the "London Infirmary," at a house

PRICES CURRENT (Continued). BRICKS, &c.

Table listing prices for Quoins, Bullnose, Flats, Double Stretchers, Double Headers, One Side and two Ends, Two Sides and one End, Squints, Second Quality, White and Dipped, Salt Glazed, Thames and Pit Sand, Thames Ballast, Best Portland Cement, Best Ground Blue Lias Lime, Grey Stone Lime, and Stourbridge Fire-clay in sacks.

STONE.

Table listing prices for Ancaster in blocks, Bath, Farleigh Down Bath, Beer in blocks, Grishall, Brown Portland in blocks, Darley Dale in blocks, Red Corsehill, Red Mansfield, Hard York in blocks, and Hard York 6 in. sawn both sides landings.

SLATES.

Table listing prices for slates in various sizes and quantities, including 20x10 best blue Bangow, 16x8 best, 20x10 best blue Portman, 16x8 best blue Portman, 20x10 best Eureka, 16x8 best Eureka, 20x10 Permanent green, and 16x8 best.

TILES.

Table listing prices for Best plain red roofing tiles, Hip and valley tiles, Best Broseley tiles, Hip and valley tiles, Best Rainbow Red, brown or brindled Do., Do. ornamental Do., Hip tiles, Valley tiles, Best Red or Mottled Staffordshire Do., Hip tiles, and Valley tiles.

WOOD.

Table listing prices for BUILDING WOOD - YELLOW, Deals (best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.), Deals (best 3 by 9, 4 by 9, 5 by 9, 6 by 9, 7 by 9, 8 by 9, 9 by 9, 10 by 9, 11 by 9, 12 by 9, 13 by 9, 14 by 9, 15 by 9, 16 by 9, 17 by 9, 18 by 9, 19 by 9, 20 by 9), Battens (best 2 1/2 in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.), Deals seconds, Battens (seconds), Foreign Sawm Boards, Fir timber (Best middling Dazzig Bracket (average specification)), Seconds, Small timber (8 in. to 10 in.), Swedish hdk's., Pitch pine timber (3 1/2 ft. averages), JOINERS' WOOD, White Sea (First yellow deals, 3 in. by 11 in., 3 in. by 9 in., 2 in. by 11 in., 2 in. by 9 in., 2 in. by 7 in., 2 in. by 5 in.), Second yellow deals (3 in. by 11 in., 3 in. by 9 in., 2 in. by 11 in., 2 in. by 9 in., 2 in. by 7 in., 2 in. by 5 in.), Third yellow deals (3 in. by 11 in., 3 in. by 9 in., 2 in. by 11 in., 2 in. by 9 in., 2 in. by 7 in., 2 in. by 5 in.), White Sea (First white deals, 3 in. by 11 in., 3 in. by 9 in.), and Blowpipe.

PRICES CURRENT (Continued). WOOD.

Table listing prices for White Sea and Petersburg (Hattens, Second white deal, Pitch pine, Under 2 in. thick extra, Yellow Pine), First, regular sizes, Brails (12 in. and up), Oddments, Seconds, regular sizes, Yellow Pine Oddments, Kauri Pine, Danzig and Stettin Oak Logs, Large, per ft. cube, Wainscot Oak Logs, Dry Wainscot Oak, per ft. sup., Inch, in. do., Honduras, Talsaco, per ft. sup., Selected, Figury, per ft. sup., Dry Walnut, American, per ft. sup., as inch, Teak, per load, American Whitewood Planks, Per ft. cube, Prepared Flooring, 1 in. by 6 in. and 7 in. yellow, planned and shot, 1 in. by 6 in. and 7 in. yellow, planned and matched, 1 1/2 in. by 6 in. and 7 in. yellow, planned and matched, 1 in. by 6 in. and 7 in. white, planned and shot, 1 1/2 in. by 6 in. and 7 in. white, planned and matched.

JOISTS, GIRDERS, &c.

Table listing prices for Rolled Steel Joists, ordinary sections, Compound Girders, Angles, Tees and Channels, ordinary sections, Flitch Plates, Cast Iron Columns and Stanchions, including ordinary patterns.

METALS.

Table listing prices for Iron, Common Bars, Staffordshire Crown Bars, merchant quality, Staffordshire "Market" Bars, Mild Steel Bars, Hoop Iron, best price, galvanized, Sheet Iron, Black, Ordinary sizes to 20 g., 20 g. and 24 g., Sheet Iron, Galvanised, flat, ordinary quality, Ordinary sizes, 6 ft. by 2 ft. to 12 ft. by 2 ft., Sheet Iron, galvanised, flat, best quality, Ordinary sizes to 20 g., Galvanised Corrugated, Ordinary sizes, 6 ft. to 8 ft., Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker, Cut nails, 3 in. to 6 in., (Under 3 in. usual trade extras).

PLASTER, &c.

Table listing prices for Coarse Plaster, Coarse Knees and Paris cement, Fine do., Robinson's Fireproof Cement, Do. Finishing, Whiting.

LEAD, &c.

Table listing prices for LEAD - Sheet, English, 3 lbs. & up, Pipe in coils, Soft Pipe, ZINC - Sheet, Vieille Montagne, Silesian, COVERS, Strong Sheet, Brass, Copper nails, Strong Sheet, Thin, Tin - English Ingots, Solger - Plumbers', Tilmers', Blowpipe.

PRICES CURRENT (Continued). ENGLISH SHEET GLASS IN CRATES.

Table listing prices for 15 oz. thirds, 21 oz. thirds, 26 oz. thirds, 31 oz. thirds, 35 oz. thirds, Fluted sheet, 15 oz., Hartley's Rolled Plate, Extra Fair, OILS, &c., Raw Linseed Oil in pipes, Best Elastic Copal Varnish for inside work, Best Elastic Copal Varnish for outside work, Best Elastic Carriage Varnish for outside work, Best Hard Oak Varnish for inside work, Best Extra Hard Church Oak Varnish for inside work, Fine Hard Copal Varnish for inside work, Best Hard Copal Varnish for outside work, Extra Fair Paper Varnish, Best Japan Gold Size, Best Black Japan, Oak and Mahogany Stain, Berlin Black, Knotting, Best French and Brush Polish.

VARNISHES, &c.

Table listing prices for Fine Elastic Copal Varnish for outside work, Best Elastic Copal Varnish for inside work, Best Elastic Carriage Varnish for outside work, Best Hard Oak Varnish for inside work, Best Extra Hard Church Oak Varnish for inside work, Fine Hard Copal Varnish for inside work, Best Hard Copal Varnish for outside work, Extra Fair Paper Varnish, Best Japan Gold Size, Best Black Japan, Oak and Mahogany Stain, Berlin Black, Knotting, Best French and Brush Polish.

TO CORRESPONDENTS.

J. P. B. (Received too late). S. T. (Amounts should have been stated). E. B. (Too late next week). NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED. We are compelled to decline pointing out books and giving addresses. Any commission to a contributor to write an article is given subject to the approval of the article, which, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

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

BRIDLINGTON QUAY.—For alterations to No. 30, King-street, for Mr. J. R. Collinson. Mr. J. Earnshaw, architect, Bridlington Quay: F. Cornet £150 0 0 S. Atkin £110 0 0 F. Kneeshaw 123 14 Barr & Booth 106 0 C. Simon 118 0 A. Gattard 100 10 F. Flintoff 115 0 [All of Bridlington.]

BUCKERELL (Devon).—For the erection of a house, for Mr. A. M. Read. Mr. E. H. Harbottle, architect, County Chambers, Exeter. Quantities by Mr. F. E. Simpson, Heavitree, near Exeter: Linscombe & C. Turner £1,923 0 0 Son £1,602 0 0 W. J. Granger 1,780 0 0 E. Harris 2,285 15 0 Nichols 110 0 Mings & Boon 2,101 0 0 Bradnich 1,854 19 0 Stephens & Son, Ltd., 1,975 0 0

BUCKNELL (Salop).—For additions to schools for the managers, Bucknell Schools. Mr. T. Evans, architect, Market Buildings, Groven Arms, Quantities by architect: G. Bullock £189 0 0 Weale & Lloyd £163 5 0 G. Chadwallader 179 0 0 Anthony & Roberts, Overton & Sans 176 0 0 Knighton 157 0 [Architect's estimate £180]

CARLISLE.—For the erection of stabling, stores yard, workshops, &c., for the Corporation. Mr. H. C. Marks, C.E., City Engineer and Surveyor, 36, Fisher-street, Carlisle. Quantities by City Engineer and Surveyor: Tom Scott £4,881 7 1 James Bealy £4,455 0 George Black 4,794 16 3 Joseph Hindson 4,430 0 Beaty Bros. 4,660 0 John H. Reed 4,369 0 Wm. Dady 4,597 0 J. & R. Bell, John Laing 4,425 0 Carlisle 4,361 0 [Surveyor's estimate, £4,551.]

[See also next page.]

CHATHAM.—For the erection of laundry buildings, Boster's Hill. Mr. H. H. Dunstall, architect, 9, New-road-avenue, Chatham. Quantities by the architect:—
 W. C. Snow £1,519 0 0
 G. West 1,225 0 0
 West Bros. 1,324 0 0
 W. Coker 1,322 0 0
 Chatham* 1,219 0 0

EASTBOURNE.—For alterations at the Town Hall for the Corporation. Mr. W. C. Field, Borough Architect and Building Surveyor, Town Hall, Eastbourne:—
 Thomas Glover £220 0 0
 Dennis & Co. .. 263 0 0
 Cole & Son .. 250 18 6
 W. Llewellyn. 249 0 0
 Mark Hookham
 Springfield-rd.
 Eastbourne* .. £219 12 0

EDGWARE (Middlesex).—For the erection of teachers' houses and caretakers' rooms, High-street, for the School Board. Mr. J. Hudson, architect, 23, York-place, Baker-street, W. Quantities by architect:—
 Talmond & Sons £1,995 0 0
 W. Bailey 1,965 0 0
 Foster Bros. 1,937 0 0
 J. Christie 1,897 0 0
 W. Tout £1,893 10 0
 Wilson Bros. 1,831 0 0
 Dupont & Co., Watford* 1,607 0 7
 F. Hodges 1,655 10 7

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The Builder.

VOL. LXXX.—No. 3046.

JUNE 22, 1907.

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St. John's Church, Westminster.—Measured and drawn by Mr. A. Wyatt Papworth	Double-Page Photo-Litho.
"The Towers," Devonshire.—Messrs. Chas. R. Dibdin and H. F. Waring, Architects	Double-Page Ink-Photo.
Hospital for Epilepsy and Paralysis, Malda Vale.—Messrs. Young & Hall, Architects	Single-Page Photo-Litho.
Higher Grade School, Hackney.—Mr. T. J. Bailey, F.R.I.B.A., Architect	Single-Page Photo-Litho.

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The Great Fire at Antwerp and its Effects.



THE conflagration by which the greater part of the Royal bonded warehouses at Antwerp was destroyed on the 5th inst. ranks amongst the remarkable fires of modern times, as much from the rapidity which marked its progress as from the completeness of the destruction in which it resulted.

The Royal bonded warehouses consisted, as may be seen from the plan which we give, of an extensive group of buildings in three main blocks, facing the Quai de l'Entrepôt on the west, and partly connected at the rear, towards the Avenue du Commerce, by buildings of less height on the east. The main blocks consisted of six stories above the basement, and the central block had a large internal courtyard. The connecting buildings on the east side were partly one story and partly four stories in height. In the courtyards, and particularly to the south of the main blocks, were a number of detached one-story buildings, indicated on the plan by crossed diagonal lines. The central and southern main blocks, as well as the connecting buildings on the east side and all the one-story buildings except the group at the extreme south-west corner, have been completely destroyed.

The fire started on the 5th inst. at 2.30 p.m.; at 2.40 p.m. the fire brigade were called out; at 4.30 p.m. the buildings were all alight; at 5 p.m. the first roof fell, and by 6 p.m. the whole of the roofs and floors had fallen in and the fire was under control for the first time. The efforts of the fire brigade to keep under the conflagration were practically impotent until the roofs and floors had fallen in and the fire to this extent had burnt itself out. Complete extinction of the fire was not, of course, at that time possible, and, indeed, has not up to the time of writing this

been effected, but the fire was from that time prevented from spreading.

The whole of the buildings were not occupied by bonded goods alone, but some of the upper floors were let out to private tenants, and it was in one of these tenancies that the fire started, on the top floor of the central block over the point marked A on plan. It is believed that the outbreak was due to the spontaneous combustion of some old sacks which were tightly tied up in bundles and had become damp. The division or party walls did not extend higher than the plate level of the roofs of the main blocks, and the fire quickly travelled through the roof and top floor of the central block, then burnt downwards, and, with a strong northerly breeze blowing from the sea with a rising tide, leaped across to the one-story building on the east side, then to the four-story building and the southern block.

The warehouses contained a miscellaneous stock of goods—coffee, sugar, wool, tobacco, &c., with wine and spirits in the basement; but the stocks were below the average, the amount of sugar, for example, being only one-fortieth of that usually stored. One factor in the rapidity of the fire could be readily comprehended from an inspection of the northern block which has not been consumed, and that is the remarkably dirty condition in which the warehouses were kept, judging from this building, to which the others are said to have been similar. The floors were coated with sugar; dirt and dust, fragments of straw and other combustible matter were widely spread, so that ample food for a rapidly-extending conflagration was present.

The construction of the buildings also was eminently suited to a quick communication of the flames. The division or party walls, as we have already noticed, did not divide the roofs and had many openings in them, some closed by open lattice-work wooden doors, others by single iron doors of thin plate, about ½ in. thick and badly fitting. The floors were constructed of 1½-in. deal boarding on 11-in. by 3-in. fir joists, 10 in. apart, carried on wrought-iron plate

girders. These girders were of very light construction, consisting merely of ¼-in. web, 1 ft. 11½ in. deep, with, for flanges, two angle irons, 2½ in. by 2½ in., of ¼-in. metal. The girders were supported by cast-iron columns, 10½ in. outside diameter and ½-in. metal (on upper floors). As stays from column to column transversely were rolled iron joists 7½ in. by 3¼ in. of ¼-in. metal. This construction is shown in detail on our plan. The weight of the floor was not carried on the walls, although the ends of joists and of iron girders were built in, but upon a row of the cast-iron columns with girders supported upon them, placed close to the walls, as shown on the plan. The various stories had free communication by open skeleton staircases of wood, and also by lifts for goods, so that the whole of the main blocks destroyed and the adjacent buildings on the east side were, in fire insurance parlance, "in one risk."

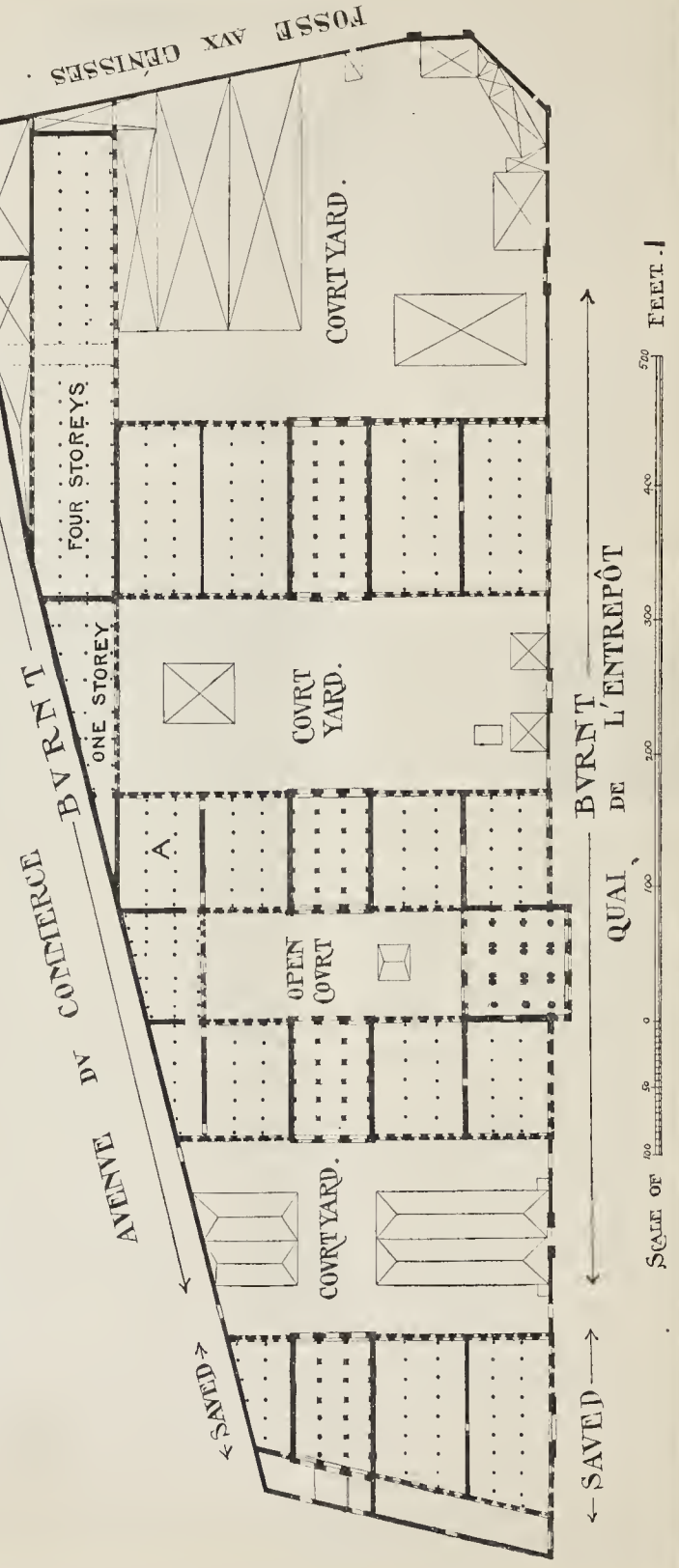
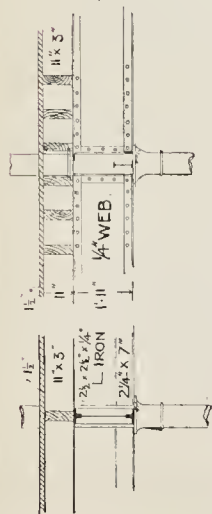
The walls were well built of brick, but, measured by the standard of our own Building Acts, too thin for their height and length. The lower parts of the façades to the sill of the first floor windows were faced partly with a cream-coloured limestone and partly with what is locally called "blue granite."

The avenues through the centre of each block were vaulted in brick, and on some of the upper floors were brick arches carried by cast-iron girders, but beyond this there was no pretence of fire-resisting construction or sub-division of areas except for the futile iron doors already mentioned. The date at which the buildings were erected, A.D. 1831, was, of course, anterior to the general idea of non-combustible construction, to say nothing of so-called fireproof or fire-resisting work. Even the window frames and sashes were of wood.

Everything, therefore, was prepared for the rapid development of a fierce heat, and the heat attained was in some cases sufficient to fuse parts of the cast-iron columns (cast iron melts at from 2,000 deg. to 2,800 deg. Fahr.), whilst the radiated heat from the central block was, in spite of the

**: ROYAL BONDED WAREHOUSES :
: ANTWERP :**

**: DESTROYED BY FIRE 5TH JUNE 1901 :
: 2.50 P.M. TO 6.0 P.M. :**



strong northerly breeze, sufficient to fire the northernmost block, although to windward. The efforts of the fire brigade, however, prevented this building from serious injury. Isolated one-story buildings to leeward, although a considerable distance away, as may be seen from the plan, were completely burnt.

The facilities for coping with so great a conflagration were unfortunately insufficient. The whole fire brigade of Antwerp, 100 men, were on duty, and after about 4 p.m. the Malines fire brigade were summoned also, and sent eighty men and engines, whilst the Brussels fire brigade sent a detachment at about 7 p.m., who, however, soon returned, the fire being then under control. Town hydrants were situated all round the building and in the courtyards, as well as a system of six hydrants from the hydraulic mains supplying the motive power for the lifts. The pressure of water was for some time insufficient to enable the brigade to reach higher than the third floor, and to add to the list of misfortunes, of the two powerful steam floats belonging to the town, one was under repair, whilst the other was outside the lock gates and could not reach the fire as the tide was low.

The effects of the fire on the materials used in construction were in accordance with previous experience. All woodwork, even to lintels and frames, built into brickwork was destroyed, except in the case of massive beams of oak, and in some instances fir, though there were examples of even heavy timbers 12 in. by 12 in. completely burnt through. Wrought-iron girders were bent and twisted into corkscrew form, and light iron trusses of one-story buildings suffered likewise. Cast-iron columns and girders were snapped cleanly across, and in some cases, as previously mentioned, partly fused, apparently after fracture. Stonework was deeply spalled and shivered. Brickwork was uninjured, except where walls were pushed out or pulled over by expansion or twisting of ironwork, and this was the fate of many of the lofty walls. Brick vaulting also stood well, except where it bodily collapsed by the failure of its supports or abutments. Glass was shivered or melted, although note should be made of an exception in one low-story building which, built of brick walls with the upper part lighted by side windows some 4 ft. high, glazed with wired glass in wood frames and covered with corrugated-iron sheeting on light iron trusses with fir purlins, was wholly burnt out, except one window, of which sufficient of the woodwork remained to support the glass, whilst the remainder, although scintered, as is the one still left, appear to have fallen out bodily after the combustion of the wood frames.

It is interesting in connexion with the rapidity and intensity of the Antwerp conflagration to compare the most recently adopted form of construction exemplified in the bonded warehouses at Hamburg, at present being constructed. Here all beams and stanchions or story [posts] are of massive oak timbers, bolted together (and this, we think, is a weak point) with heavy wrought-iron bolts. The buildings are in several stories, five or six above the basement, and two of the floors have light steel joists, embedded in and protected, both above and below, by concrete, so that the extent of a conflagration is hoped to be limited. The floor areas

are of moderate size, and staircases are constructed of iron joists wholly encased in concrete, on which the steps are formed.

The openings to the stairs are closed by single doors formed of two plates of sheet-iron, with about 2 in. or 2½ in. of non-conducting material between. To minimise damage by water, which is rightly regarded everywhere in Germany as being only one degree less to be dreaded than that by fire, the floors are laid with a fall to the external walls, and provided with scuppers.

The success of the Hamburg method has yet to be proved by actual experience, but the principle appears sound, to minimise the extent of a conflagration and to resist the fire by slow-burning construction rather than by the use of non-combustible material, recognising that, as all experience shows, unprotected ironwork is the least trustworthy of all fire-resisting substances.

Had such a treatment of the building existed at Antwerp, it is hardly probable that the fire brigade would have been so hopelessly handicapped as to be unable to obtain control of the fire until assisted by the destruction of the buildings.

The loss in money value is, of course, tremendous, the buildings alone being insured for 20,000,000 fr., whilst the total loss is estimated, perhaps roughly, at some five or six million pounds sterling. In the loss several of our English companies have been severely hit, amongst them especially the Norwich Union, the Royal, the Phoenix, and the North British and Mercantile.

NOTES.

WHILE we fully sympathise with the healthy tone of Professor Lethaby's lecture at the Institute of Architects, it appears to us to be pervaded by two fallacies. In the first place, he seems to take no account of anything in the past except mediæval architecture; and because he does not find the name of architect there, he wishes us to conclude that there was no person whose function was the same as that of architect. The argument apparently runs thus: Mediæval cathedrals were built by workmen. Mediæval cathedrals are the finest buildings. *Ergo*: the finest buildings can be best produced by workmen. Apparently Greek, Roman, and Renaissance architecture go for nothing; but it is certain that on Greek and Roman buildings architects were employed, and even the name was there as well as the function. Some of the Renaissance mansions in England seem to have built themselves as the result of a desultory correspondence between the owner and the master-builder or foreman; but in Italy the important buildings of the Renaissance were the work of individual architects, and we have their name in most cases. And in English mediæval buildings there is, in many cases, ample internal evidence of the guiding mind of an architect. Professor Beresford Pite, in the discussion, coupled in one sentence Salisbury and Peterborough together; but we should regard them as essentially distinct in regard to the architectural element. The west front of Salisbury, with its clumsy mixing up of detail and its want of a prevailing unity of conception, may well have been the work of Professor Lethaby's masons: Peterborough front is the concep-

tion of an architect. Secondly, Professor Lethaby seems to ignore the altered requirements of modern architecture. A Norman castle with its naïve and inconvenient arrangements for living, might have been put together by a troop of masons; but let him give over a modern mansion to the workmen to build as they like, and see what the owner will say to the result!

WE print on another page an admirable Report of a special meeting of the Liverpool Architectural Society, convened on the 13th inst. to consider the question of the site for the proposed Liverpool Cathedral. We are glad to find that the Society have come to the same conclusion which we have more than once expressed, in favour of the Monument-place site as decisively the best from an architectural point of view. We hope their Report will receive the consideration it merits. It appears that the Bishop has formally approved of the St. James's Mount site, but we presume nothing that is irrevocable can have been done yet, and we hope the matter will be reconsidered. If the St. James's Mount site is actually taken, we are of opinion that a serious mistake will have been made, as will probably be discovered when it is too late to rectify it.

A POINT of some interest to those concerned with building estates was recently decided in the case of *Whitbread & Co. v. Watt*. The plaintiffs contracted to buy what is called a public-house plot from a building speculator when the latter had built three hundred houses on the estate, and they deposited a sum on the signing of the agreement. Subsequent to this event the vendors mortgaged the estate, and the mortgagee under his power of sale sold it to a third person. But by the end of the time within which the three hundred houses were to be erected they were still unbuilt. In accordance with their contract the plaintiffs rescinded the agreement, and claimed to have a lien on the estate in respect of their deposit. The contention was upheld by the judgment, the defence that the deposit could only be recovered as a personal debt being overruled. With the legal discussion which preceded the judgment we are not concerned, but the practical point is important, since it is clear from the decision that a person might buy an estate burdened with an obligation which might, in some cases, make a considerable difference as to the ultimate profit to be obtained from the transaction. The decision is the more important when it is borne in mind how frequently building estates are mortgaged and how often the original plan is not carried out.

THE result of the appeal in *Portsmouth v. Seward*, reported in our legal column in this issue, is important for architects to note, in regard to questions arising out of the transference of a professional business or connexion. Mr. Seward, the well-known architect, of Cardiff, had a branch office at Swansea, where Mr. Portsmouth, the plaintiff in the case, represented him; but he eventually made over the Swansea connexion to the plaintiff (we are not informed for what, if any, pecuniary consideration), undertaking not to keep an office

"Education in Building."

Portsmouth v. Seward.

or practice as an architect there, but reserving the right to act in any cases in which he might be called upon. Mr. Seward competed for and gained the Swansea Harbour Offices, for which the plaintiff was an unsuccessful competitor, whereupon the latter obtained from Mr. Justice Kekewich an injunction to restrain Mr. Seward from carrying out the building. Seeing that the plaintiff obtained no premium in the competition, and would not in any case have been employed to carry out the building, this was not either a very logical or a very generous way of acting; and we are surprised that a judge so shrewd and so generally well acquainted with architectural matters should have granted an injunction at all. At all events, the Appeal Court reversed the decision without calling on the appellant's counsel for a reply: and rightly. Mr. Seward undertook not to practise as an architect in Swansea; *i.e.*, not to have an office there; but he was within his rights in competing. A London architect who designs and superintends a building, say in Birmingham, is not therefore "practising in Birmingham." If it is desired, in such a case, that the vendor of the practice should never erect any building in the same town, it should be "so nominated in the bond."

The annual general meeting of the Gas Institute was held in London last week, and after the delivery of the President's address a number of papers relating to carburetted water gas, and incandescent lighting with gas under high pressure, were read; and a lecture was delivered by Dr. Frank Clowes on the table photometer and standard pentane lamp, which have recently replaced the old forms of candle photometer in all the testing stations of the London County Council and City Corporation. The President, Mr. T. Ormiston Paterson, in his address, pointed out that gas is being more generally and extensively used for cooking, heating, and power purposes, as is evidenced by the continued approximation of the day to the night load in consumption, and expressed the opinion that gas will soon be valued according to its heating value instead of by its illuminating power. Experiments made by the President at Birkenhead confirmed the statement that the duty (in lighting power) per cubic foot of gas consumed in incandescent burners is dependent upon the calorific power of the gas. This statement is commonly accepted in this country as correct, but we should like to know how British gas engineers explain the claim of Dr. Strache, of Vienna, that plain, non-luminous water-gas made by his process, having a much lower calorific value than coal gas, and consumed in burners without admission of air before the point of ignition, is giving as high a lighting value per cubic foot of gas consumed as is obtained from ordinary coal gas. Dr. Bunte also has shown that a mixture of coal gas with 20 per cent. water gas, having an illuminating power of only 3.1 Hefner candles, has fully as great a lighting value for incandescent gas lighting as the coal gas *per se* which had a higher calorific value and an illuminating power of 15 Hefner candles. If the lighting value of gas for incandescent lighting be dependent solely upon its heating value, and the statements of Dr. Strache and Dr. Bunte are also

correct, the inference to be drawn is that a much higher light efficiency than that commonly obtained should be procurable from coal gas with its high calorific value. Extensive investigation is yet required of the relationship between light and heat in the Welsbach system.

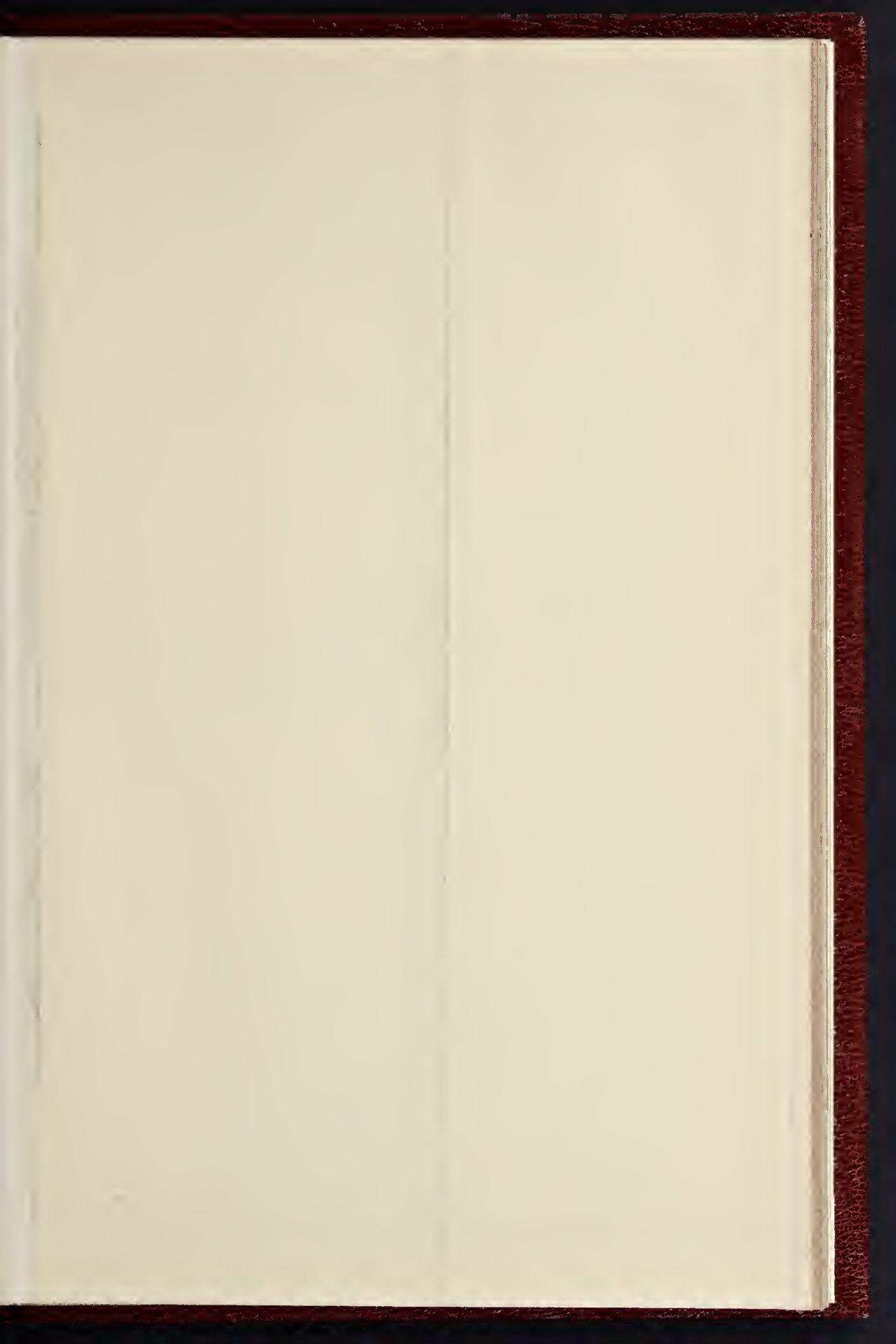
THE Electric Lighting Act of 1882 gave the Local Authority the power of purchasing the works of any supply company in its area at the end of a period not exceeding forty-two years. Corporations therefore stand in much the same relation to supply companies as landlords do to tenants. It is clearly then their duty to safeguard their interests, so that when the time comes for the purchase they may be able to exercise their rights to the best advantage. Mr. Mordey's report on electricity supply in Newcastle illustrates this point most forcibly. At the present time there are two supply companies in Newcastle, and their provisional orders have about twenty years to run. One of these companies obtained an Act of Parliament in 1900, empowering it to construct a new generating station outside the municipal area for the purpose of supplying electricity "in bulk." This new station is now in successful operation, and the company naturally want to supply part of their Newcastle system from it. The Board of Trade, before granting them permission, wished to hear the opinion of the Corporation, who have retained Mr. Mordey as their adviser. Mr. Mordey points out the multiplicity of supply systems in Newcastle, and that if each company develops on its own lines, then it will be practically out of the power of the Corporation to exercise its right of purchase at the end of twenty years, as the system of each company will only be part of a large general system which could be profitably supplied from the outside generating station, but which could not be supplied by a municipal station inside the area. He therefore strongly recommends the Corporation to purchase the supply systems inside their area by arrangement, and then interconnect all the networks so that one station would be able to supply all the demand during periods of light load. It seems to us that the right of compulsory purchase will be very little use to corporations if all they can purchase is merely a special network of very much depreciated cables. Judging from recent events, it looks as if the supply companies had found a way of evading the spirit of the Electric Light Act of 1882.

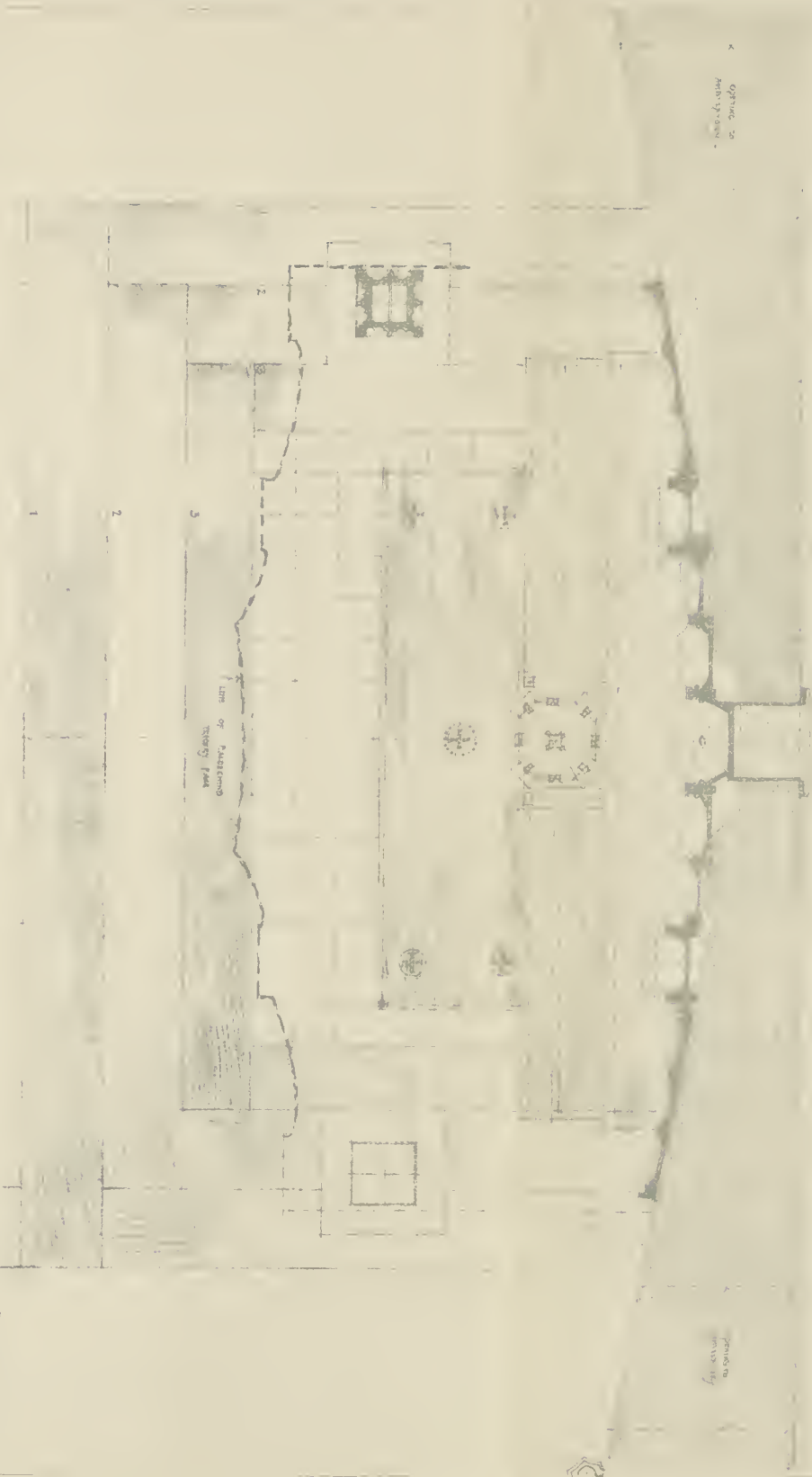
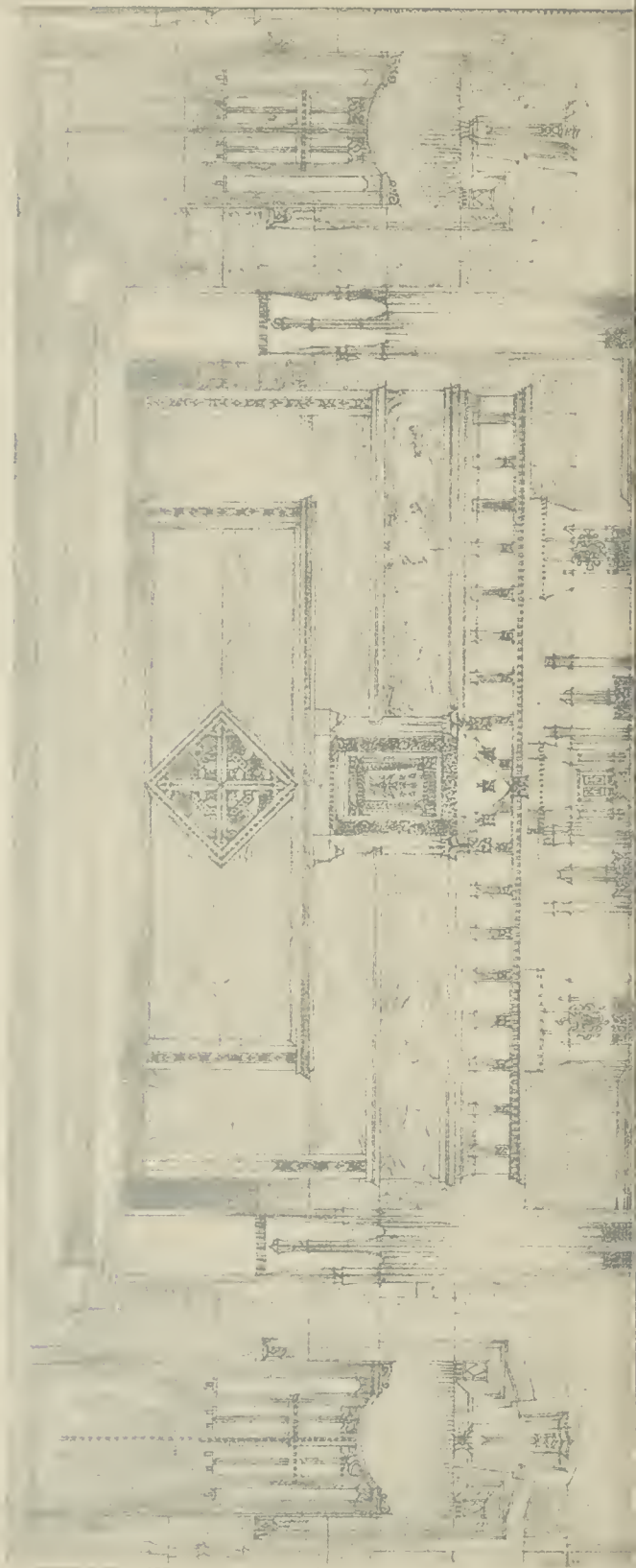
An exhibition of the art and manual training given by the London School Board was opened on Tuesday at the Examination Hall, Victoria Embankment. The work shown has been executed in day schools and in evening continuation classes, and also in the schools of special instruction for the blind and deaf. The teaching given is not of a technical nature, and does not interfere with the technical schools and classes of other bodies. The art and manual training in the day schools is calculated to awaken the interest and intelligence of the children both in art and in manufacture. If, for instance, a child has a leaning towards cabinet-making or modelling, the tendency receives some impulse, and the boy is in the right direction towards earning a livelihood as a useful member of

society. Much of the work at the present exhibition is done at the evening continuation schools by amateurs, who find recreation after their day's work in drawing or carpentry. Of all the classes, that of woodwork shows the best results. Before a student may construct an article, he has to make a working drawing of it, besides large details in wood of the more difficult parts or joints; he may then make the object itself. We should like to see the taste educated by having better designs to execute, and the hand restrained from the liberal use of sandpaper. The teachers should as far as possible insist upon simplicity of design and directness of execution. These remarks are also applicable to the wood-carving. The drawing and design is not so interesting as last year—at least there are fewer exhibits of merit. The exhibition as a whole is a wonderful evidence of the liveliness of the School Board in a certain direction.

LORD AVEBURY, in opening the exhibition of practical work executed at the Institute's technological and manual training examinations—now on view at the Imperial Institute—emphasised the value of technological education to the welfare of this country and the colonies, and pleaded for a more general recognition of the claims of science in the public schools. We think more systematic training in natural science in our schools would be a direct gain to the industries of this country. One of the most important factors in success in any undertaking is a mind trained to concentration, and accustomed to ascertain facts, not content with suppositions current as truth. It is pitiable to think of the amount of waste incurred annually through misdirected labour. Science as part of a general education is, however, a different thing to the teaching of science in its application to special industries, and the Institute, in their efforts to secure for the teaching of technology some recognised State aid similar to that given to the teaching of science and art, are endeavouring to prevent any overlapping in the organisation of their classes and examinations. During the last year teaching in several industries has been extended and strengthened by co-operation with trade associations. Silk spinning and weaving have been placed on a better educational footing. Paper manufacture, an industry of a scientific nature, in which the stress of foreign competition is largely felt, will now be dealt with by the Institute in conjunction with the Paper Makers' Association. The exhibition of candidates' work is of a very representative kind, including joinery, cabinet-making, building and carriage construction, mechanical engineering and drawing, metal-plate work, practical bookbinding, basket-making, needlework and millinery, beaten metal work and enamelling (from the Northampton Institute, London), weaving, plumbing and painters' work. It is, as it were, complementary to the exhibition of the London School Board manual training classes referred to above.

In a short letter to the *Times* Mr. Arthur Evans reports fresh and important discoveries at Knossos, which he considers throw an entirely new light on the architecture of Homeric Greece. East of the great central





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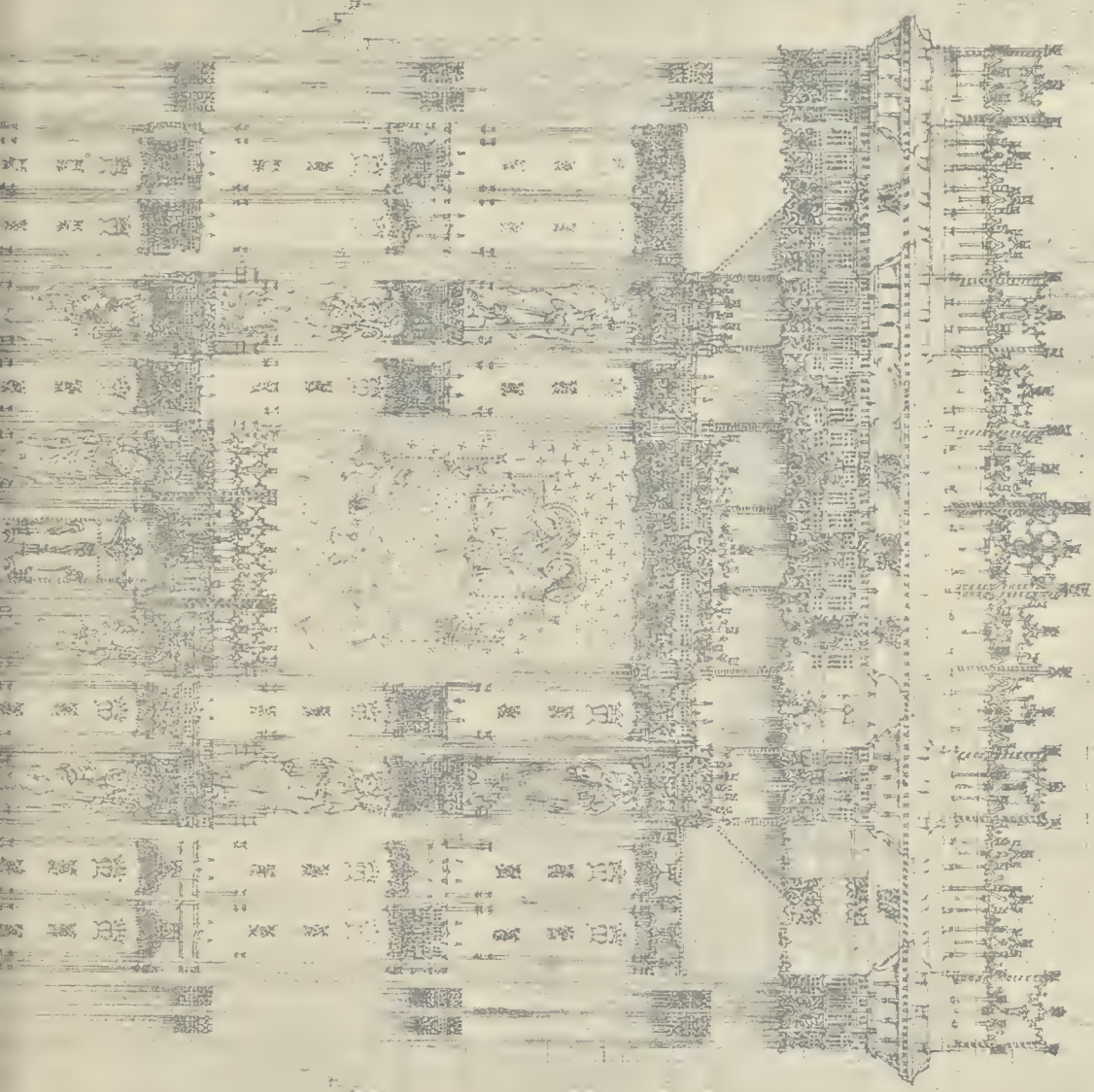
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Line of Partitions
Showing Pass

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J. F. EASTWOOD
ARCHITECT.
42 CHESTER ST. CINCINNATI, OHIO

NA PHOTO. SHARQUE & CO. 117 - 4 S. EAST WASHINGTON STREET, PITTSBURGH, PA.





court he has found a suite of chambers with walls descending 20 ft. (that is, we presume, rising 20 ft. from the ancient ground level), and including the remains of upper stories. It is probably these "upper stories" which Mr. Evans especially regards as giving us a new idea in regard to Homeric architecture. In one of the chambers were fallen fragments of human figures in high relief and of splendid execution, "the rendering of veins and muscles showing a naturalistic skill never again rivalled till the Italian Renaissance." Explorers are, however, a little inclined to rhapsodise about the beauty of the works they discover, and we should be disposed to wait and see the figures or their photographs before concluding that they rival Renaissance art.

It is stated that in consequence of the decease of Catherine, Duchess of Cleveland, who died on May 19 last, the Battle Abbey property will shortly be placed in the market. It had been purchased from the Webster family by Lord Harry Vane, who afterwards succeeded as fourth Duke of Cleveland, and died on August 21, 1891. Lord Harry Vane had married, in 1854, Lord Dalmeny's widow (*née* Lady Catherine Stanhope), to whom he bequeathed Battle Abbey for her dower house. During her residence there the late Duchess devoted many years to the compilation of her last work, "The Battle Abbey Roll, with Some Account of Norman Lineages," which John Murray published in 1889. Reputed copies only are now extant of the original muster-roll of the names of knights who followed the Conqueror from Normandy, but the accomplished authoress of the book spared no pains in her endeavours to trace out their histories and pedigrees. After the Dissolution, the monastery at Battle, formerly Epiton, and then valued at 987*l.* os. 10*d.* per annum, was bestowed by Henry VIII. upon his Master of the Horse, Sir Anthony Browne, K.G., who began the building of the house. His son, elevated Viscount Montague, removed from Battle to Cowdray. In the earlier years of the eighteenth century Sir Thomas Webster, Bart., bought the property at Battle from the then Viscount Montague, his descendant sold it to Lord Harry Vane in 1857. The fine gateway of the Benedictine abbey, founded by William I., forms a conspicuous feature near the high street of the town, and several portions of the conventual buildings were incorporated in the mansion-house. The ruined altar of the abbey church marks, it is believed, the central position of the English camp; the supposed remains of the chapter-house were discovered in 1817. The estate extends over about 3,600 acres.

If a sharp look-out is not kept on the proceedings of Tramways Companies, as well as Local Authorities, every stone bridge over the Thames, within the London district, will be spoiled. Kingston Bridge, a fine and dignified structure built by Lassidge in 1825, is now threatened by the London United Tramways Company, who want powers to widen it. The Chairman of the Select Committee of the House of Commons put the question—"You would not propose that the widening should be carried out by means of cantilevers?" to which an evasive answer

was returned, to the effect that "there were two or three ways of doing it." From the nature of the reply we should conclude that the company do intend to use cantilevers if they can get permission to do what they like with the bridge; but that, knowing the proposal is likely to be opposed, they will not say so. Kingston Bridge is at present one of the adornments of that portion of the Thames; it is to be feared it will soon cease to be so.

THE exhibition of the Pastel Society at the Institute Gallery in Piccadilly contains rather too much of landscape and too little of figure work, which latter is what pastel is best suited for. The infinite gradations of landscape effect can hardly be followed out with a material so little plastic, though it affords a good medium for the record of special effects in special lights. M. Ménard, in "Le Soir" (1) has been very successful in doing just what pastel can do with landscape, when the minute details of colour are lost in a half-light. So with Mr. Austen Brown's "A Grey Evening" (5) and "On a Potato Field" (6), where composition rather than colour is the main object. In "At the Ferry" Mr. Padgett has made a brilliant suggestion of sun-lit water seen from under the shade of trees; and he has confined himself to suggestion, which is all that pastel can really do with such a subject. Mr. Nettleship's animals (73 to 76) come out exceedingly well in pastel, as also Mr. Livens's fowls (100); and M. René Billotte has succeeded admirably in his moonrise effects (142, 143) and in his "Une Rue de Village" (144), though it does not answer to the sub-title, "La Nuit"; there is too much light and too much colour for that. Mr. Aumonier, in "On a Common" (159), and Mr. Peppercorn, in "A Note" (183), illustrate very happily the capacity of pastel for giving a brief memorandum of the general effect of a scene, on a small scale. M. Prouvé's life-size nude, "Ondine" (230), is too green in colour (this may be intentional) and has the waist of a Parisian fashion-plate figure. Mrs. Sutro, in "The Ploughman's Home" (233), and Mrs. Stanhope Forbes in "L'Ombreuse Allée" (122) and "L'Avenue des Sapins" (124), show the capacity of pastel for giving the effect of bright dashes of light in a scene. Mr. Arthur Tomson's "August Night" (200) shows a great power in handling the materials so as to produce depth of tone by cross hatching in different colours. M. Guignard's "Le Dune près d'Étaples" (272) is one of the most admirable works in the gallery—exactly the kind of scene which pastel can best render, and which is treated with the greatest artistic feeling for composition and tone. The exhibition is a very interesting one.

FURTHER NOTES AT THE GLASGOW EXHIBITION.

In our first article in the *Builder* of the 8th inst. we dealt with the general effect of the exhibition from an artistic point of view, and the contents of the Fine Art section. In this article we will give some further notes touching on the objects illustrating decorative and applied art, as well as on some other exhibits which cannot be grouped with any special class.

We may begin with a word on some of the subsidiary buildings in the grounds. The Great Hall, as it is called, suits its purpose very well as a concert-room, but in other

respects is one of the least attractive of the erections. It is difficult however to treat a circular building in merely temporary architecture; a circular plan does not lend itself to picturesque effect, and seems to require a monumental treatment. The exterior appearance of the building is shown in Mr. McGibbon's sketch in our issue of April 6; the rotunda is kept exceedingly plain externally, while internally the colour decoration is rather too gaudy. The interior architectural design shows an arcade on columns all round, the columns cut in two by a gallery on the soffit of which an apparent capital is given to that portion of the column, to take away the bald appearance of the columns going right through the gallery. The iron dome is under-drawn by a ceiling treated in ribs and with somewhat the general appearance of a velarium, though not actually such. Not the slightest attempt has been made to render the organ a decorative object, which is to be regretted, considering how easily an organ-case lends itself to decorative effect, nor is there the slightest break in the general design at the point where the organ comes in, so that it looks as if it got there as an afterthought; yet it surely must have been known that there was an intention to have an organ there.

The Canadian pavilion is a much more gratifying erection; as a temporary structure it shows excellent taste as well as originality and piquancy in design. The Indian theatre pavilion, though less original, is also picturesque, with its centre picked out in bright colours, its side walls in horizontal bands of alternate red and yellow, and small turrets at the angles crowned by little metal cupolas. The Agricultural pavilion is treated with a strongly marked wooden modillion cornice; the higher central compartment has a small dome, flanked by pillars with vase terminals rising above the roof line. One of the best and most picturesque erections in the grounds is the Van Houten Cocoa pavilion, designed by Mr. A. N. Prentice. The Japanese pavilion is a mistake; instead of any attempt at a characteristic exterior, we find a commonplace pilastered building, its nationality only marked by a kind of trophy of Japanese curly clouds and sunrays above the entrance door, behind which the conventional figure of Britannia presents a most absurd contrast. If however Japan lacks character in her pavilion, this is amply made amends for by Russia, whose four pavilions, which at the time these notes were made were still in process of internal arrangement and not open to visitors, are certainly, in their exterior architecture, racy of the soil, and about as curious and fantastic erections as it would be possible to see—somewhat too fantastic, but at all events they are not commonplace, and there is a good deal about their treatment that is very clever.

Near the west end of the main exhibition building, and between it and the Art Gallery, is the special pavilion erected by Messrs. Templeton for the exhibition of carpets woven in Glasgow. They have chosen to make their pavilion in the form of a Moorish mosque with a cupola covered with Saracenic strap ornament; the imitation is a very crude one externally, and hardly worth carrying out, but internally it produces a building very well suited for its purpose, giving a series of large recesses for the exhibition of separate classes of carpets, and an effective top lighting. The compartment to the left on entering is devoted to carpets designed by Mr. Walter Crane, some of which are exceedingly fine; that at the left, a dark neutral green carpet with light-coloured flowers connected by sprays of a lighter green; that on the floor, a fine geometric-pattern carpet, very large in scale, and such as could only be used in a very large room; and, facing the spectator, one of beautiful design hung on the wall. On the right are one or two designs which, fine in themselves, we object to as carpets, because they are distinctly upright designs, growing in one direction, and therefore properly only fitted for a vertical position as hangings; a carpet should be the same design every way, with no right or wrong way up. The excuse offered by the makers is that it is a matter of economy in weaving, and that it costs less to work a design all one way than to work it in symmetrical repeats in opposite directions; this one can quite understand, but when one comes to carpets of the sumptuous class of work shown here, economy of this kind seems out of place and hardly worth consideration. Other bays of the building contain very fine carpets of different types of design; in the

furthest bay is a large and grand carpet of French Renaissance type of design; on the right is a bay of Oriental carpets. All the work is of the first class, and most of the designs are fine and artistic, and no visitor should omit inspecting the interior of this pavilion, which forms one of the best artistic points in the exhibition.

Coming to the interior of the main building, officially called the "Industrial Hall," we find the principal portion of the space east of the central dome devoted to foreign and colonial exhibits, and the bulk of the floor space westward of the centre to British exhibits. Commencing at the portion nearest the central dome, we find ourselves among silversmiths' exhibits; but there is nothing to be seen here worth special comment; the cases represent the usual average product of first-class silversmiths' establishments. Two furniture exhibits with special houses to themselves, which we come to next, stand in a different category. Messrs. Wylie & Lochhead, of Glasgow, are really artistic cabinet-makers, and their suite of rooms presents a collection of furniture and other objects marked everywhere by good taste and refinement, and with a certain amount of originality, though of course there is to some extent a repetition of the characteristics which we meet with elsewhere as representing the taste of the most recent school of applied art design in this country; there is some appearance too of the influence of the new German school of furniture design, though fortunately not carried to the excess of sinosity which one sees in German up-to-date art publications. This however is a most satisfactory exhibit as a whole; among the best things we may mention the settee in the dining-room, and the fireplace with repousse brass fender and surroundings. Next to this Messrs. Heal & Son have erected a room with a characteristic exterior wall, of dark grey bricks below and white picked out with green above; and inside they show a suite of bedroom furniture, of admirable design and make. The ornament is chiefly in the way of simple forms of inlay; the wardrobe with a central curved bay, decorated in this way, is a most pleasing piece of work. Of the whole exhibit it may be said that, though people may differ as to preferring this or that form of furniture for their bedrooms, we think that it would be impossible to pick out any detail in this exhibit which could be said to be in bad or wrong taste. That is a great thing to say for a manufacturing firm which (we believe) produces all its designs within its own doors, and it shows what real progress has been made in the understanding of applied art in this country, that such a show as this can be produced by a London trading firm.

The Irish Peasant Industries Association have got a well-arranged stand with a Moorish front to it (why Moorish?); the contents it does not come within our province to describe, we only mention it as a decoratively-arranged stall. The same may be said of the Morocco exhibit which faces the end of the central avenue; a stall or house of Moorish design and gorgeous in colour, containing an assortment of Oriental textiles such as we are familiar with. For the present we may quit the Industrial Hall, having reached its western boundary, whence we emerge into the long annex called the Grand Avenue, which starts off in a quadrant curve southwards, and then continues in a straight line in a north-westerly direction. Down the centre of this avenue, for the greater part of its length, is arranged an immense collection of large and minutely-finished models of ships built on the Clyde; and though it does not come within our province to notice these in detail, we cannot refrain from a word of recognition in regard to the splendid manner in which this great Clyde industry is illustrated. The sides of this avenue are lined with booths or stalls largely devoted either to furniture or to materials or processes connected with building; and these we may pass in review as far as space allows.

Taking the left-hand side first, the Pilkington Pottery Company, just at the angle turning into the quadrant, have a good exhibit in the shape of an erection in which the piers and main part of the walls are covered with green glazed facing tiles, and the walls at the back lined with decorative panels and tile pictures; the decorative designs are generally in good style and the colour effect satisfactory. A good many of the succeeding exhibits on the same side we can merely mention briefly.

Messrs. John Finlay & Co. (Glasgow) exhibit some furnishing metal-work among which are some metal utensils of simple character but good form; they also exhibit a range. Messrs. Woyka & Co. have a show of decorative mouldings in woodwork; Messrs. Wilson & Boyd, cabinet makers, exhibit furniture which cannot exactly be called artistic, but which is good in its way and on pleasing lines; the Bennett Furnishing Company, of Glasgow and London, show school desks of solid and practical design. Then we have another succession of ornamental cabinet-makers' work, of which the first in order, that of Messrs. H. Gardner & Son (Glasgow), includes a bedstead which is worth attention for its good lines and careful execution in detail; the end shows a curved rail dropping between two square angle posts and supported by thinner upright rails between. There is style in this; and here as in some of the other furniture exhibits one finds that some things have style and some have not. Messrs. Taggart's furniture is what is called "handsome" furniture, but has not the quality of style; nor has the work of the Furniture Union Company, nor that of Messrs. Jebb & Sons, though there is a solid dignity and sumptuousness about their large leather-covered furniture which is praiseworthy. Messrs. Stewart Pollock & Co., who have a large exhibit, show some good inlaid and brass-finished bedroom furniture, somewhat too pretentious for our liking, but good of its kind and admirably finished; and there is a bedstead in a simple classic style which is better than the more ornamental work. We should not omit to mention the exhibit of Messrs. Francis Smith (Glasgow) of office furniture, not decorative (nor intended to be so) but exceedingly well made, especially in the attention which is bestowed on the forms of handles and pulls to the drawers, which form part of the structure and will not come off; a frequent source of annoyance with drawer handles.

After passing the side entrance we come to a few exhibits of a more practical nature. Messrs. Chubb exhibit the actual safe door, of Harveyd armour plate, which was tested by a blow from a hundred-pound shell fired at it, as before mentioned in our columns. The door hardly shows any confusion. This door, when closed and locked with its clutch bolts on each margin, is without handle, and a magnet is provided to pull it open. They show also a safe intended to hold large drawings, with large shallow drawers, such as are generally used in architects' and engineers' offices, but which are here enclosed within a steel safe. Messrs. Milner, in the next stall, exhibit the construction and working of their "banker's door," in which a strong steel framing is pushed out at all the margins simultaneously, working into a rebate all round, by the turn of a single lever in the centre of the door. Messrs. Hope have an exhibit of very good metal sashes, and Messrs. Macfarlane a show of their steel ware, viz. cups and saucers, candlesticks, &c., made in thin steel and enamelled in colours; these form unbreakable ware of very pleasing effect. Messrs. Ritchie (Belfast) have an exhibit of their roof sheathing felt, showing the raw material and its application on a model wooden roof.

Opposite to these exhibits, and in the centre line of the avenue, are some articles of decorative character. Messrs. Erard have a small show of their pianos, with which we are only concerned here in regard to outward appearance and design, and on this head we may compliment them on the treatment of the inlaid grand piano which they exhibit, and which stands on well-designed framed legs which are a satisfactory contrast to the ordinary piano support. Messrs. Paterson, who are we believe a Glasgow firm dealing in pianos, have some fine examples, among them the Broadwood piano designed by Mr. A. C. Blomfield and illustrated in our issue of March 23; it looks even better in reality than in illustration, and is perhaps the best grand piano case which has been designed in this country. A Steinway in the same exhibit, decorated with rich and flowing inlay designs, though perhaps a little exuberant, is a fine piece of work; the weak point in it is the treatment of the legs, which are not well joined on to the rest, and look as if they had originally belonged to another design. The British Carrier Wood-carving Company have a well got-up exhibit of their machine-carved ornament, chiefly in the shape

of lengths of repeating ornament and enriched mouldings; in a notice affixed to the exhibit they maintain that this is really "carved" wood; but unless it is gone over by the hand (which is not asserted), it is no use saying this; machine work is not carving in the proper sense of the word. They show a small room completely fitted up, as far as woodwork is concerned, with their products, and the general effect is pleasing enough, but it can never have the artistic value of hand carving. It may be worth while, however, to employ this method for the simpler types of repeating ornament. The exhibit of Messrs. Burroughs & Watts, the celebrated billiard-table makers, forms the close of the central series of exhibits, the *pièce de résistance* being a most elaborately carved billiard-table in unvarnished wood; an exceedingly good piece of work as far as execution goes, but it falls in point of design; it is an attempt to produce effect by sheer richness of ornament, without having had good general lines of design as a basis to work on.

Returning in the contrary direction, along the north-east side of the avenue, we find in the centre line, next to the billiard-table exhibit, a very characteristic little room fitted up by Messrs. George Walton & Co. "designers and manufacturers"—so their *affiche* reads. The iron grille gates which close their small house are excellent specimens of effective but unpretentious metal design; they were closed at the time of our visit, but as far as one could judge by looking through, the whole of the objects exhibited seem to show original and artistic character. On the other side of the alley the Tynecastle Company have a fine show of their embossed and gilt wall coverings, rich in effect and all in good style; they also show a room representing a part of a steamer's cabin, showing the application of their work to cabin decoration. After this we come again to various furniture exhibits, of varied merit. Messrs. Campbell & Co. (Glasgow) take up two bays with carved walnut furniture of good type but with no special quality of style. Messrs. Archibald Stewart & Co.'s office furniture is good of its kind, their decorative furniture pleasing but presenting no special quality. The Greenwich Linoleum Company exhibit a number of specimens of their material, some with geometric patterns which are really good and suitable to the material and its purpose; the floral patterns are not. The Silicate Paint Company exhibit various articles painted with silicate paint; there is nothing special in the designs; it serves to show the application of the paint. The furniture exhibit of Messrs. James Simpson (Glasgow) has some special character; they show a large cabinet in which the stiles are of nearly black wood and the veneer panels of figured wood; we are told that it is entirely walnut wood, of different types; the effect is good, though there is no specially artistic quality in the designs. Mr. John Crawford (Glasgow), wood carver, has got up a spirited and original piece of work, a kind of carved wood frontal, filling up the bay which he occupies; some of the details are rather odd, but it is a clever bit of work. Messrs. G. Rome & Co. (Glasgow) exhibit their fibrous plaster by means of an architectural front with Louis Quinze plaster wall decoration in the rear. Messrs. Hampton & Sons have a small but very rich exhibit, one may say in all styles; we prefer to see a firm choose a style and work it out, instead of trying to provide something for all tastes. The best thing in their collection is the small cabinet with inlays in line, and a front on an oval plan; there is character and refinement in that.

Messrs. Donlon have an exhibit near the east entrance, containing examples of their well-known glazed stoneware, as also sanitary fittings and materials (which will be considered under a separate heading). At the east end of the building, in the Danish section, there is an interesting exhibit of the work of the Royal porcelain manufacture at Copenhagen. This consists of two or three distinct classes of production. There is a china with light bluish grey ornament, floral or animal, on a white glazed ground; in this class also are numerous well modelled animal forms in porcelain, realistic in form though not in colour. Then there is a pretty and more rustic variety of work, with thin-lined blue patterns on white ground, and open-work borders; and there is a more decorative type, with a good deal of colour and gilding, and also with open-work rims. This exhibit is worth attention, as it introduces us to a special class

of work which is of considerable artistic interest. There is a considerable exhibition of Glasgow porcelain and pottery ware. Messrs. Cochran & Fleming make a large show of work with no special character; Messrs. MacDongall & Sons a somewhat similar exhibition, containing work which has, however, a certain Parisian stamp about it, with a clever use of the figure as ornament; and Messrs. Sneddon & Sons, among the numerous articles they exhibit, show what they call the "new Worcester Pottery" of James Hadley & Sons, for whom we presume Messrs. Sneddon are the northern agents. The characteristics of this ware are that it has a semi-porcelain "body" of exceptional strength, enabling it to retain the exact form of the original model during the first firing process; a new application of colouring clays during the "casting" stage of manufacture; and a leadless glaze, said to be "of exceptional brilliance"; this exceptional character we do not recognise, but the ware is a good one and worth attention.

We shall continue our notes in future numbers.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Ordinary meeting of members of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, Mr. Wm. Emerson, President, in the chair.

Death of Mr. J. A. Russel Inglis.

Mr. Alex. Graham, Hon. Secretary, said he had to announce with deep regret the death of Mr. J. A. Russel Inglis, of Edinburgh, who was elected an Associate in 1894, and who was the Soane medallist in 1897. Mr. Inglis was one of their younger colleagues of great promise. He was known both in Oxford and Edinburgh, and was for a long time in the office of Mr. Hippolyte Blanc. There were a good many of their students who had come across Mr. Inglis in his earlier days, and he was sure they would join in their regret at losing so distinguished and promising a colleague under such tragic circumstances. Poor Inglis had suffered from insomnia, and he took an overdose of a sleeping draught and died suddenly last Sunday night. They could ill afford to lose a young man of such promise as Mr. Inglis.

The Architects' Benevolent Society.

The President said he had the pleasure to announce that the appeal which he made at the annual meeting of the Architects' Benevolent Society had been successful, inasmuch as he had already received 1,189*l.* The Society was greatly indebted to the gentlemen of the allied societies who had so promptly and so liberally responded, and they were particularly indebted to Mr. Macvicar Anderson. He hoped the announcement he had made would not stop the flow of subscriptions as the demands upon the charity were large and ever increasing, and the donations and pensions which it was able to give were eagerly sought for. No one knew better the needs of the Society than the late Mr. Arthur Cates. He was for many years its treasurer, and at the time of his death was a trustee. He had seen it announced in the *Times* that Mr. Cates had left the Society a legacy of 1,500*l.*, and that in itself was sufficient to show that the Society needed more liberal support, and that the money entrusted to the Committee was wisely distributed. They had received no official announcement at present with regard to Mr. Cates' bequest, and therefore he simply mentioned it as from the *Times*.

Professor W. R. Lethaby then read a paper on

Education in Building.

Professor Lethaby said he was sure that all the usual apologies would apply to his paper. He had had very little time, and one of the chief difficulties was that in writing he tried to have in view his audience and he found he could not, and so he had written it to himself. He wanted his title, "Education in Building," to suggest something which was usually meant by architecture, but also to cover the whole range of activities associated with the art of building. Their current use of the word architecture was likely to be very ambiguous—it meant anything or nothing, according to the verbal needs of the moment. Attempts were frequently made to give the word architecture a definition, but it was essentially one

of that class of words which had suffered by shifting its meaning and by decay—it was almost one of the words which folk-loreists could treat as a myth-making word. The word architect was very infrequently found in the Middle Ages, and then only as a loan from the Latin, meaning "master in building craft"—the master mason or master carpenter. In the fourteenth century a carpenter was called an architect, and there was a later example of a man called Harrison, who arranged the pageants for James I. in 1603, and who signed himself "joiner and architect." The use of the word "architecture" was just as infrequent. The words in use for architecture in the Middle Ages were "carpentry," or "masonry," or "mason's craft." Each new effort in castle or cathedral was called the "Work." The great Royal Palace in Paris obtained in this way its name of Louvre, which was handed down to the present time. Everything was known in France and Germany of the manner of production of their mediæval buildings, but in England they knew little. There was a curious reserve in England as to the architects of mediæval cathedrals, although the facts lay ready at hand for any investigator. Vague theory still held the field; they went on repeating that the architects were unknown, or that these cathedrals were the works of monks or travelling freemasons, or were designed by clerks like Edward of Westminster or William of Wykeham. But he believed the main facts were ascertainable. Carpenters and smiths and masons were early organised into distinct guilds. In the twelfth century the carpenters were spoken of before masons, but in the thirteenth century the workmen were generally spoken of as masons and carpenters. These crafts organised the education of the body by an apprenticeship system, which, while placing the youth with a given master, did it under the sanction of the guild in general, and even of the community. Practically, in London, to be entered as apprentice was to be apprenticed to City life. Mastership in craft and the freedom of citizenship were taken up together; a mason's or carpenter's boy passing through his seven years' course was received into the guild as master. He believed that the curious thing called the freedom of the City, which was now handed about in gold and silver caskets, was merely the natural right of every London craftsman who, having gone through seven years' apprenticeship, should receive the freedom of his mother city. "Master" was a definite degree of craftsmanship, and granted exactly like the Mastership degree at a University after apprenticeship in letters. There was, in fact, an exact parallel in the taking up of the gown and hood; and the master craftsman in the Middle Ages stood in degree alongside with the master of letters, and the master of masonry and the master baker stood with the master of letters or physic. His fur robe and his distinct cap marked his mastership in craft. The word master did not mean an employer, but a graduate of the guild. The real explanation of mediæval art was to be found in the fact that by his guild the workman claimed an honourable place in life. The craftsman prided himself on his tools, as the knight on his sword, and workmen even set themselves to gain coats of arms for their guild, which arms were engraved on their own tools. They could hardly realise the airs the craftsman of London gave himself. He was part owner of the City, and he would have no lord's man in his guild, and he set himself against the handling of goods for profit. This guild organisation was a chief factor in the Middle Ages. At the end of the thirteenth century in Italy and Belgium, and to some degree in England, there was a great struggle between the two powers—the nobles and the organised guilds. As now, if a shed was to be built the carpenter was called in, and if they wanted a wall to be built the mason was called in. So, in the Middle Ages, if a house was to be built it was left to the chief carpenter, and if it was a church to the mason. The employer had, of course, a considerable say in the matter, and some barons very closely laid down the lines on which their castles were to be constructed. With works of great importance, like a cathedral, an agent might be employed to represent the employer—such a man as William of Wykeham. When such a work as a cathedral was going forward a resident mason and carpenter were employed. The title of Abbey Master at Westminster was changed only last century, and it was quite probable that there

had been an unbroken succession of masons at Westminster from the time of Henry III. He spoke of normal conditions, of course, as cases might be found where some mason, recognised as a great master, would advise by consultation, and the resident mason would work under his advice. It was often said that there must have been some co-ordinating authority, or the carpenter would wish to put the roof upside down; but the reply to that was that the carpenter did not wish to do so, and the employer would have dismissed him if he had. Moreover, the chief master employed, like an officer to-day, would be the general consulting leader. "Instead of vaulting this," the mason would then say to the employer, "we will get Bob to put couples on." There was no artistic nous about it, but it was in the directness of the work that the interest of old buildings lay. It was a matter of true evolution; it was just doing work "as it ought to be done in the craft of masonry." It was a disgrace to their scholarship and interest in their own country that not one name of the old English master carpenters or master masons were to be found in the new "Dictionary of National Biography." There was an enormous amount of material at hand which was hardly ever looked over. The rolls of Westminster Abbey had specially interested him, as they dealt with their greatest work of art. He found that the term master mason was in general use in the twelfth century, which implied that they had already in existence the organised guild which defined what a master was. Professor Lethaby proceeded to quote liberally from the rolls of Westminster Abbey in support of his contention that the real architects of the Abbey were the master craftsmen employed by the King. Thus in 1244 they found that preparations were being made for rebuilding the Abbey by Henry III., and in that year there was a mandate from the King that the Sheriff of York should confer with Simon the Carpenter and Henry the Mason. The King's Carpenter then in charge of the work at Windsor was Master Simon, and Henry the Mason may have been associated with him there. Probably this Henry the Mason became the first master of Westminster Abbey. Edward of Westminster, the King's Clerk at the time, with another represented the money side of the business. Four years after the commencement of the work they found from the accounts that Master Henry received 60*l.*, and Master Alexander received a sum of money for timber, and there was not much doubt that Alexander was the architect carpenter with Henry the Mason. Later the King ordered 600 or 800 men to be put on the work, and a mandate was addressed to Henry, the master mason of the works. Master Henry was succeeded by John of Gloucester in 1254, but although they knew more about Master John of Gloucester than of Master Henry, the character of the work was laid down in the ten years of Master Henry, and they must call him the mason architect of Westminster Abbey. In 1256 there was an order that the work should be overlooked by John, the King's mason, and Alexander, the King's Carpenter, and the rolls showed that they received fur robes. In 1256 the ancient gateway of Guildford Castle was constructed by John and Alexander, and there was mention of work done at Woodstock by the same mason. In 1258 the King rewarded John of Gloucester by giving him a house; he died in 1260. John of Gloucester was succeeded by Robert of Beverley, whose name occurred in 1259, when Robert of Beverley seemed to have been associated with John of Gloucester, and after the death of John there was probably an interruption in the work and it was at the time of the Barons' wars. In 1263 the name of Master Robert of Beverley appeared, but there was no mention of Abbey works until 1267. About this time John of St. Albans was the King's Sculptor, and he probably carved the fine figures in the interior. The accounts of 1269 and 1272 still mentioned Robert the Mason. Robert was employed on the work on the accession of Edward I. The great work of Edward I. was the completion of the Tower of London, and in 1274 they found Robert of Beverley mentioned in connexion with that, and again in 1276 in connexion with the Royal Mews at Charing, and in 1278, Robert the Mason, with the Aldermen of London conferred as to what damage would arise if part of the old city wall in Ludgate was pulled down so as to provide for the old Blackfriars

Church. About this time records showed that the annual expenditure on the Tower was 2,000 marks, an enormous sum in those days. In 1278 the accounts of the King's Clerk were audited by Master Robert of Beverley, and in 1279 Master Robert of Beverley was still Keeper of the King's Works. Robert the Mason was evidently a great favourite of the King, who on one occasion gave him a tun of wine. He was succeeded by Richard Crundal, the King's Mason, who was responsible for the Cross at Charing to Queen Eleanor. He died in 1204 before the cross was finished, and it was carried out by his brother Roger. At this time also Richard of Witham was working at a cross. In 1322 they still met the name of Master Witham, as King's Mason, and he was succeeded by Master Thomas of Canterbury. In 1326, William of Ramsay worked as mason at the Royal Works and he was a great London master. He built the beautiful chapter house of St. Paul's, begun in 1332, and in 1338 he was appointed Chief Mason and Chief Surveyor of the King's Works. He was probably the William of Ramsay who was on the Common Council of London in 1348. Professor Lethaby then gave the names of other King's Architects from the time of the Black Death. He believed that the accounts of the Greek building customs were much the same as those he had referred to in England, and in Persia, India, and Italy the thing was practically the same. Everywhere building developed by experiments of practical masons and carpenters. It might be impracticable to bring back that state of affairs, but it was necessary to recognise that the evolution of masterly building was what was meant by the words "ancient architecture." In considering the future and the present in the light of the past the question was, What was there left for them to do? Should they aim at reviving the forms of some still untaught style—the style of Mycenæ or of Mexico, for instance? They had had quite recently the evolution of perspectives, "architectural printing," and base ornamentation. If he might suggest a name for it at all he would suggest the Syndicate Style. They must turn in a practical way to the art of building to-day supported by the experience of the past. Archaeology was a very amusing study, but in its present form it was only a branch of history. As to proportion, nobody knew anything more about that than that work done with a large reasonableness looked well. Nothing was better proportioned than a North-Western engine to its driver or a bit of plumbing to the plumber. As to the principles of design, one architect used to boast that he never used iron girders in his life, and another said that modern architecture would be born of iron and glass. With regard to beauty—that subtle and elusive essence which spoke through man's nature and work—no general reasoning could be adduced on it save so far as a man might try and explain what moved and touched him. Work certainly was a serious part of life, and it was work they had to teach. Nothing really new or beautiful could spring in architecture except from reasonable work. It was sometimes said that if they were only ignorant there would be hope, but instead of the blankness of ignorance he thought it would be better to have the fulness of knowledge, which voluntarily went its own way. How far should the study of building go?—all the way or part. He thought they should study it in all ways. They could spend more time at the work and less in the office. They could learn much about building by mixing with the men who still handed on amongst themselves the traditions of their craft. One man knew how one thing was done in a locality, and another knew something else. One remembered how stone was axed; one remembered that they put two coatings of skimmed milk on ceilings; and another that hearthstones should be better set in fireclay, and so on. They were living through a period of quick change in those things, but probably the most valuable work they could do was to gather together the old recipes of the workmen which had survived through ages. These rough men, the "so-called British workmen," represented the mediæval architect, and it was absolutely necessary that there should be some common relations between the architect and them. As it was, he had never gone on a building and watched them work but what he had wished to beg their pardon for his own ignorance.

From the organised trades one might get advice as to local materials and labour. Those unions in a much changed form represented the old guilds, and he felt certain that in time to come they would assume more and more the functions of the old guilds. At present they were fighting the war of wages, but he felt that with the almost entire failure of the apprenticeship system the teaching would come back to the men themselves. Masons would again have to teach masons, carpenters carpenters, and plasterers plasterers. Even at this moment the plasterers were attempting to make those entering the trade go to the technical schools which existed. If they got back the definition of mastership in craft once more, and if a connexion between the organised trades and the organised technical schools be set up they would get the mediæval theory of the boy being apprenticed to his guild. The art of the monasteries was the flowing out in illuminated books, illuminated glass, illuminated wall surfaces of the security and discipline of the cloister—religion if they liked, but still peace in work. The art of Florence, Bruges, Paris, and London in the thirteenth century was the art of the organised crafts—call it civil government if they liked, but the workers' pride and reward was in the work of their hands. He was certain that where labour was honoured there art would be found, for honourable labour was art, and that proposition must stand. They must try and encourage workmen by every means in their power. He had often wondered whether it would not be possible for the men on a given work to elect a spokesman who would have access to the architect, but he supposed the builder would say it would never do for one of his own men to report; but the answer was that it was the work which paid the worker, and not the agent. Again, they must have schools of practice and theory and experiment and research. Building schools existed already in several foreign cities. It seemed to him that such schools, representing a very large and important industry, should be established and assisted out of the public funds. In a big London institution he would like to see all building crafts carried on side by side experimentally, where experiments might be made in brick-arching and stone-cutting and timber-framing, and so on. The question of education in building to be solved must reach all classes of men engaged in building, and it must set itself to improve the whole mass of building done in England. If they were to claim public help, he felt they should get rid of visionary ideals and sectarian narrowness, and stand to gain with the common gain. It would have been well if they could have been ready with a scheme in which all might have joined a dozen years ago, when technical education was first being practically dealt with, but he fancied, unless they were less vague in their aims, nothing would be done for another dozen years, and that would be a calamity. To sum up, natural living architecture would have to be refounded on common building—it could stand on nothing else.

Mr. Paul Waterhouse, in moving a vote of thanks to Professor Lethaby, said that before they entered the room doubts were expressed as to whether it would be an education for the young, or the ancient, or the middle-aged, and they found that all their fears had been realised. The lesson had been meant for all of them, and he hoped it would do them all good. He confessed that when he saw a man of intelligence and learning approaching the Middle Ages he had fears that the veil which hung over the Middle Ages was about to be removed. But though they had learned much from Professor Lethaby that evening, there were some mysteries which still remained. Professor Lethaby had insisted once more on the importance of the guild system in the Middle Ages, and had shown them, by examples to which none of them could take exception, how successful that system was. Of course, he might have carried his arguments further, and insisted on the existence of guilds at a much earlier date. They had had the architect knocked out altogether as he had been knocked out before, but it still seemed to him that the question was partly unanswered. There still seemed to be a doubt as to who designed these things. They had ample evidence that to superintend was one thing and to design was another, and they were brought face to face once more with the conclusion that the buildings of the Middle Ages, however they might look at it, somehow or other conducted themselves; that

was to say that, looking at a building like Westminster Abbey, they were reminded once more in the evidence they had had that evening that some Divine Providence designed the building, and that man was more an instrument than an originator. In fact, he believed that was the conclusion which Professor Lethaby would bring them to, and it brought out the great contrast between the architect-to-day and the architect of the Middle Ages. It brought it out so strongly that he thought they would feel it was impossible for them to revive, even with the help of the trades-unions—who hardly looked like giving help—the condition of the Middle Ages. The great contrast of the architect-to-day with the architect of the Middle Ages was that they found themselves faced by new inventions, and no doubt the true answer of the problem-to-day of design might be, as was the design of the Middle Ages, simply skilful continuance. All the same, it seemed impossible at this period of history to neglect design as a preliminary study for architecture. In fact, he was sure Professor Lethaby did not mean them to take the view that the past could be disregarded. It might be the duty of the architect to reject the traditions of the past, but he could only do his duty after he had learned what had been done. When he was a master of that he could turn it over and go on his own way. The New Testament did not make mention of an architect, but in the Greek Testament the word architect was applied to St. Paul as a "wise master builder" who laid the foundation. From that it appeared that at all events in one period of history there was an architect who could do so useful a thing as to lay a foundation. He would like to make one remark with reference to a form of contract he found some years ago in a book—Gardener's "History of Dunwich," which was one of the towns submerged by the sea on the East Coast. In that book there was a reference to the contract for building a tower. The tower was built by two men paid much in the same way as they had had described that evening. They were paid in tithe, and got fish and a coat a year if they were good men. But if one read the contract carefully one realised how extremely simple was the problem laid before the men. They were simply bound down to do a certain number of things, and most of them were to be imitations of other buildings in the neighbourhood. It taught one once more the lesson that in the Middle Ages, whatever they did—and they knew they produced excellent results—there was no question of striving for originality.

Professor Pite, in seconding the motion, said it really was a very extraordinary paper and one which he imagined none of them were able to anticipate, and at times they did not quite know to what conclusion they were being skilfully driven by the serious and ascertained facts with regard to mediæval building, which had been so thoroughly laid before them. That mediæval architecture evolved itself step by step was a fairly self-evident proposition, but he thought he must join issue with Mr. Waterhouse inasmuch as they did not find in the work the architect as they knew him, the architect as they trained him, or the architect as they thought of him. One could imagine there coming into the scheme of Westminster Abbey a man with a fine idea of what a cathedral should be—an idea based on something outside the narrow limits. The development seemed invariably to proceed from impulse, and sudden impulse, and an impulse which existed, at all events, unchecked until the time of the Black Death. They saw the process of development arrested in the western end of the nave of Westminster Abbey, and arrested in a singular way. They found development arrested, and the previous work at the eastern end was nearly copied. There were other instances of this view of mediæval architecture, which certainly brought before them the spectacle of a mind burdened with that originality with which they all suffered in this new century. He was thinking of such a work as the west front of Salisbury Cathedral or the west front of Peterborough Cathedral. One looked at that and felt that they were altogether out of the tide of development. A new element had come upon the scene. A poetic thinker had dealt with the material at hand. When they thought about that and sought to understand how it was arrived at they found that there was one bit on another of Romanesque. The types of the Romanesque

abbeys and churches in England were undoubtedly original—the intention was manifest; for instance, the west front of Lincoln, with the three great arches, which he found suggested the great arches of Peterborough, and the great mass of arcade walls, which might have suggested Salisbury. They found this poetic element at work, but it seemed to have been introduced from outside and set aside from the regular development of mediæval building as such. They came to the Renaissance, and a new world was set up for the world that then was—a world of antique art and discovery. It was then that the architect as we now know him arose—the man who, without being trained in the handwork of the crafts with which he dealt, yet dealt with the material as so much a part of the picture, and so in that way he dealt with the new architectural forms which had been discovered, and arranged them and applied proportions to them, and watched the effect. Time moved on, and they found that the mysterious Spirit of Art slackened in her grasp of the building arts. The arts became dead, and as the artistic instinct seems to lose power over the architectural, somehow it seemed to give power to the craftsman. If they looked to the eighteenth century in England they found that imagination had lapsed, but the perfect skill of the domestic builder was in their midst. They used the Renaissance forms and arranged them as the early architects arranged them. That was killed at the end of the eighteenth century again by what was called the Gothic revival. Here they would do well to contemplate the problem of future style—to ask where they were and how they were to design this building and that. Professor Lethaby's position was a logical one, but it would be a difficult one to work under; but if the position was sound it would sooner or later assert itself, and they could not afford as a profession and as architects to go on arguing in the quagmire of styles. They could not with self-respect retreat back upon Victorian development; they could not pick up any of the lost threads of the last century and start again with them. There was a time when they were threatened with a Chinese revival shortly after the time of Horace Walpole. What was the new century to be threatened with? That brought them to a point, which was the position they held as an Institute with regard to education in art. They could, of course, only work with the existing traditions of the profession. Could they in their excellent wisdom insist on a knowledge of one style or another? Was the time yet come when they could dispense with the channel which existed between the art of design and the art of construction, and dispossess themselves of the idea, which, unfortunately, was a fact, that men who were good at design were bad in construction, and those who were good in construction were bad in design. Until they had attained that point Professor Lethaby would have been preaching to them in vain; that time must be arrived at they all admitted. They admitted that a properly-qualified architect was the man who should be a good constructor and a good designer. But they could not be content with that idea. They must do their best to get some solid doctrine of architecture into their own system, and he only hoped the paper they had had that night would lead them to heart-searching in this matter. In that Institute they were in a very curious position. They would remember the circumstances connected with a manual drawn up ten or twelve years ago, with regard to the examinations in architecture, when it was pointed out that examination in the art of design and the art of architecture was hardly possible. It was not considered to be at all events proper and desirable, and the Institute at that time had all its examinations in design conducted in a different way from that in which they had previously been conducted. But the position generally was unchanged, and when they came to consider the admission of Fellows to the Institute the policy of the Institute offered a complete reversal. The principle was accepted with regard to Fellows provided they were good constructors and provided they were accepted and reputable practitioners. This body did not examine them in design, but examined them in those parts of their professional life and work which affected the good of the country. He thought the time was coming for the sound sanity of that policy to be applied to the Associate of the Institute

as well as the Fellow, and he would like to suggest that a further modification might be arrived at by the Board of Examiners with regard to examinations in architectural style. Architectural style was altogether worn out and played out, and they did themselves no good by perpetuating it. They might ask for a proper acquaintance with the forms of certain buildings, as a matter of example, and as a matter of example alone, but they ran the risk in doing that of diverting the attention of the student to the outside of the building rather than to the main principles which underlay it. The paper was a very interesting one, and it opened on all sides interesting possibilities for discussion, and he hoped it would bring forward effective results in their daily practice.

Mr. Leonard Stokes said he sympathised with Professor Lethaby in his views, but at the same time he was bound to say that he could not quite follow them out to a logical conclusion, and he really doubted whether Professor Lethaby did himself. The old days were very charming days, and one wished one could live in them, when John the mason started by scratching his head, and called in Bob the carpenter, and consulted whether to put a wooden or a stone roof on the top. He joined issue completely with Professor Lethaby there. He did not believe that sort of thing ever existed. He thought there was some scheme from the very first that the building should have a vaulted roof. He admitted that frequently John the mason made a mistake, and before he got the top on found the building would not carry one of stone, and then he would call in Bob the carpenter and ask him to put on a wooden roof. Bob would do it; but it was not a design—it was a muddle, and there were lots of them all over the country. They made those muddles still; but two blacks did not make a white. He gathered that Professor Lethaby wanted them to go back to the old muddle, when they began to do something they did not know, and ended by doing something they did not want. He thought the architect was made out to be more ignorant than he really was. Professor Lethaby assumed that the architect did not know what a block of stone was or the best timber to use, but they all knew far more than the ordinary bricklayer or carpenter what could be done with the stone or timber. Professor Lethaby wanted them to go and learn from the bricklayer. That was all very well, but the bricklayer was a dunderhead in nine cases out of ten, and made all sorts of silly mistakes. "Bond" was everything to the bricklayer, and they would do anything to get that, and make the whole design subservient to some recognised rule of "bond." He did sympathise with Professor Lethaby when he said that honest work was everything, and that style had been bandied about as a sort of nightmare, and which he had described very excellently as the syndicate style—as to that class of work being honest work, it was not. He did think, however, that the lecturer did the modern architect an injustice, inasmuch as he assumed him to be so horribly ignorant.

Mr. Thomas Blashill said that one of the comforts we had in listening was that one could accept the lecturer's premises without coming to his conclusions. He thought what had been said by Professor Lethaby was most instructive as far as it enlarged the information of what was done in early times, but when he dealt with the Abbey of Westminster he was bound to say he was unable to think that that particular building—French in its design, although English in detail—could have been designed at any time by Robert the mason, or any of those men whose names had been mentioned. It was true they did not know who it was did it, but there might be reason for that. There was not that anxiety in olden time in a man to have it known for all time that he himself had done this. Few people then put their names to that which they did. He might be wrong in suggesting another reason, for no one else had suggested it, and probably, therefore, he was wrong. It was that the class of men who worked upon these buildings with their hands or as designers had not, as a rule, a second name or a distinctive surname. No doubt there were fifty other Johns of Gloucester and Roberts of Beverley—they were names that were useful, and indicated a man on a particular job. But with the great statesmen and warriors of the Middle Ages, such as the Salisburys and Beauchamps and Warwicks, there they had distinctive names; but without that distinctive name, how

little would their deeds have been known or remembered or recorded. He believed there was something in it. If these men had had specific names which distinguished them from their fellow-men, it was more likely they would have come down to posterity. He thought they reckoned too much upon what they found in the Renaissance time. Men like Inigo Jones and a few names of that sort posed now and then as joiners and now and then as architects. They thought because in such cases the actual designer was also the worker it must have been so in all time. He did not think it was so. For a long time—a hundred years after the Reformation and after the destruction of the monasteries and owing to the political changes—hardly any building was done at all. No buildings of any consequence were erected, and the upshot of it was that when the time came that new buildings were required they had to go to the workmen who knew all about building and who were most fitted to take up the new duties. He did not think they could argue from that that there had been no special architects in the Middle Ages. He agreed that they should go the workmen for knowledge, for there was too much time spent in school and over books. There were too many details thrust upon them, too many ways of doing a thing. In the olden times there were very few ways known of doing the same thing, but now they were burdened with half-a-dozen ways and were expected to know them all. So far he agreed with Professor Lethaby, but he could not go so far as to agree that a building like Westminster Abbey grew up from a combination, however close, of superior workmen. There must have been one master mind who, from the laying of the very first course of stones, had decided and was able, either by drawings or some other way, to teach the workmen what was to be done from the bottom to the top. They knew that if they saw a plan either of a French thirteenth-century building or an English building, they could tell everything of the important parts of the structure from the very bottom to the top; and they could not suppose that a work of that kind was carried out by a chance combination of able workmen who changed from year to year and did the thing, however cleverly and however well.

Mr. Vacher remarked that a man who designed a beautiful building like Westminster Abbey must have been a highly educated gentleman and have mixed with the highest in the land, and, therefore, he thought they might take it that in those days, like the present, the man who designed these beautiful things was acknowledged to be a clever individual and no common man. He could have been no common mason or carpenter, but a man who could talk and read and a man who knew what was going on and what was wanted.

The Chairman, in closing the discussion, said that all he would say on the question was as to the points Professor Lethaby made about the work being done by the master mason or the master craftsman. If they went to India at the present time they would find the same thing being done. Some few years ago he was in India and went to Gwalia where they were building a tomb for the Maharajah, and he asked to see the drawings. The work was being done by natives and they had no drawings. They showed him a model of a dome and that was the only thing they could show. This was an enormous building and he asked how it was all arranged and the man pointed to his head and said it was there. He supposed, as a matter of fact, the cathedrals in the middle ages were built very much like that. Masters handed down to their sons certain rules and certain details, and when a building so many feet long and so many feet wide had to be built they knew what piers they would have to put in, and the master masons arranged the stones for the other masons to work on. He imagined their cathedrals were erected something like that, but he also thought there must have been some person who made some sort of drawings—some master hand which guided in the planning. That the foundations were put in and bore the building by mere chance he did not think could have been the case. That system might apply in India now, and might have applied in the Middle Ages, but with their present complicated wants in London if a big City building was left in the hands of a master bricklayer or mason or carpenter he hardly thought it would meet with the wishes of the client.



Hogarth's House, Chiswick: From the Garden.

The vote of thanks having been heartily agreed to,

Professor Lethaby, in reply, said he did not say that the building was not done in accordance with a scheme. All he said was that the work was done by the men. These men did become very great men, and became friends of their King and equal to any man in the kingdom. There was a curious assumption that a mason must be a common man, but that was a mere assumption, and when he spoke of mediæval art he tried to show that it was possible for a mason not to be a common man—he could graduate from the boy who cleaned out the shop and mixed the mortar and became the equal of any man in the land.

The proceedings then ended.

Visit to Glasgow, and Annual Dinner.

The Glasgow Institute of Architects are making arrangements for a visit of the Royal Institute to Glasgow early in October this year, and during the visit the annual dinner of the Institute will be held. The date fixed for the dinner is Thursday, October 3. The programme of the visit as at present arranged is as follows:—Thursday, October 3, Royal Institute of British Architects' dinner. Friday, October 4, (1) lunch in the Exhibition grounds, given by the Glasgow Institute to the Royal Institute visitors; (2) Visit to the Glasgow University (tea); (3) conversation given in honour of the Royal Institute by the Corporation of Glasgow. Saturday, October 5, visits to Exhibition, &c. At all Friday's functions the presence of ladies will be welcome.

BAYONNE SLATES AND MARBLE.—Writing from Bayonne recently, Mr. Paul Schoedelin, the British Vice-Consul, remarks that the trade in slates for roofing has considerably increased during the past year. No fewer than from eight to ten small sailing vessels, each carrying about 150 tons, were cleared for London, Plymouth, and ports in the Bristol Channel. It is only profitable to ship by sailing vessels, owing to the time required for loading. The same correspondent states that in several parts of the Pyrenees there are marble quarries, but the exportation is very small owing to the expensive cartage, and more particularly to the want of a powerful crane at Bayonne. The local Chamber of Commerce, however, have decided to buy a crane capable of raising from thirty to forty tons as soon as the new quay is entirely completed. Of late years a large quantity of this marble has been used for public buildings and churches. The new church of St. Eugénie at Biarritz is built entirely of unpolished marble.

HOGARTH'S HOUSE, CHISWICK.

A good deal of attention has recently been drawn to the house, formerly the residence of the great painter, in Hogarth-lane, Chiswick, and steps have been taken to preserve this historical building. In the *Builder* of February 8, 1890, a view of the house, taken from the opposite side of the road, was given. The view given to-day is from the west or garden side. The house has a frontage of about 44 ft., but, as will be seen, has but little depth. The roughness of the walling at the south-west angle seems to indicate that a wing projected southwards. Beyond some panelling there is but little of architectural detail in the interior, but the house and its surroundings are, apart from their historical associations, of a type now too seldom found, and the scheme for its preservation as a museum deserves all encouragement.

THE ARCHITECTURAL ASSOCIATION: VISIT TO GODALMING.

On Saturday, June 15, the first summer visit of the Architectural Association was paid to some of Mr. E. L. Lutyens' work near Godalming. Members left Waterloo by the 10.5 a.m. train and on arriving at Witley Station, walked to Tigbourne-court, the property of Mr. E. Horne. Mr. Lutyens was unable to be present and Mr. Horne very kindly met the party and himself showed the way over the house and garden.

The house is a striking one, and the arrangement of plan and elevations most original and interesting. Built of the local Bargate stone laid in small courses, the central portion of the house facing the main road, sets back with a shallow court, the wings of which terminate in semi-elliptical screen walls, with very charming doorways on either side. The main entrance is in the centre through an open portico. A great feature in the elevations is bands of roofing tiles laid flat in a kind of herring-bone pattern, which forms a pleasant and effective contrast with the warm yellow of the stone. The roofs have been covered with old tiles. On the garden side a small balcony with some very effective metal work was especially admired. A charming garden has been laid out round the house under the direction of Miss Jekyll and Mr. Lutyens.

Internally the house perhaps hardly comes

up to the great promise and originality of the exterior, but, though space does not permit of a detailed description, mention must be made of some very good detail in the drawing-room and in the entrance lobby. Mr. Horne most kindly entertained the party at luncheon in his own house, The Hill, which at one time belonged to Birket Foster.

Munstead Wood, belonging to Miss Jekyll, was next visited. Here the general arrangement, though not quite so striking as at Tigbourne Court, is very pleasing. The same materials are employed—Bargate stone, tile bands, and tile roofs, with oak frames and leaded lights set flush with the wall face—but large oak beams enter into the construction showing in the ceilings, in the porch, and in the first-floor corridor; great effect is obtained by means of these open timbers. The details of doors and fireplaces are very good, the fireplace in the hall especially. The whole house is full of thought and care and is, in fact, almost an ideal example of what can be made of a small house. The garden is too well-known to need description, but is indeed a joy.

Half a mile from Munstead Wood is Orchards, belonging to Mr. W. Chance, which was next visited. The house forms two sides of a courtyard, the south side containing the principal rooms, entered from a porch and doorway in the centre, approached through the courtyard under a large gateway on the north side. The east wing contains the offices and is continued out beyond the north side as stable and coachhouse. The north side consists of coachman's house, the open gateway, with some delightful detail in the roof, and on the right of this is placed a studio, which has a very interesting fireplace, all in red brick and red tile bands carried right up to the ceiling. The remaining western side of the courtyard is an arcade connecting the studio with the western part of the south front. A large garden to the east and south-east is full of interest and has some fascinating work in the walls and terraces.

Externally the same materials have been employed, and internally the house seems well nigh perfect. There are the same general features as at Munstead Wood; a large first-floor corridor on the north side of the south block has here been still further developed and is doubtless the chief factor in the plan. It is certainly successful, and the way the upper part of the porch is made to serve as a

sort of transept to the corridor, gives a character to the house, all its own. Every room has been carefully planned and each one has some quiet and refined bit of thoughtful detail. It is, perhaps, almost correct to say that the chief charm lies in what has been left out, rather than what has been put in; but turn where you will, something fresh and interesting is to be found, though all effect is obtained in the simplest manner. Mr. Lutyens has been fortunate in his clients and he has succeeded to the full in producing a perfect country home.

A peep into Busbridge Church to see Mr. Lutyens' fine bronze chancel screen brought a very successful day to a close.

SITE FOR THE LIVERPOOL CATHEDRAL.

A SPECIAL meeting of the members of the Liverpool Architectural Society was held in the Law Library, on Thursday, June 13, the President, Professor Simpson, in the chair. There was a large attendance of members, and the following Report was adopted:—

"The question of the site for the new cathedral of Liverpool is naturally one of great interest to all architects, and especially to those practising in Liverpool.

The first essential of a cathedral for Liverpool is, that it shall be a cathedral of the diocese, and not of the city only. The most central position for the diocese is that in closest touch with the railway stations. Four sites have been suggested—

- (1) St. Peter's Church.
- (2) Monument-place.
- (3) St. Luke's Church.
- (4) St. James's Mount.

These are placed in order of centrality. Of these four sites, Nos. 1 and 3 are not considered, as for various strong reasons they are regarded as inferior to the other two.

The advantages of the Monument-place site are as follows—Its position and approach are unrivalled in Liverpool. There is an opportunity here for a west front which might be the finest in Europe. The proximity of the site to the great public buildings of Liverpool is of the utmost importance. Its relation to St. George's Hall in view of state processions, civic or otherwise, is of great advantage. It is near to, or in direct communication with, the principal railway stations, and is passed by cars from the pierhead as well as by those from the north and the south of the city. The site is a very high one, the level of the ground at the west end being the same—132 ft. above the datum line—as that of the St. James's Mount site, and any building, therefore, erected thereon would be as visible from the river and the Cheshire side as one placed in the latter position. The foundation is rock. The removal of many of the buildings at present on the site would be of distinct advantage to the welfare of the city. Finally, the orientation would be that customary in English cathedrals and churches.

The disadvantages which have been urged against it are: The cost of the site; the noise from passing cars and traffic generally; and the surroundings. As regards the first, this is undoubtedly very great. The question of noise is not a serious one, owing to the construction necessary for so large a building. St. Paul's, London, is very similarly placed, and the sound of the traffic outside is hardly, if at all, perceptible inside. The surroundings, it is true, are not all that could be desired; but cathedrals ought to be equally accessible for all classes of the community, and the most favoured quarters are not necessarily the best for these buildings.

The advantages of the St. James's Mount site are as follows: The site itself would be much less expensive than that of Monument-place. The situation is a quiet one, and the surroundings are picturesque. Any building erected here would stand out well, and could be seen from the river and Birkenhead.

Its disadvantages, in our opinion, are much greater than its advantages. Its inaccessibility is perhaps its greatest; it is far removed from the main lines and centres of traffic. The site is a very narrow one, and it would be difficult to obtain a good near view of any large building placed upon it. The approach, in an architectural sense, is very bad indeed, and no vistas would be obtainable from any point. The cost of the foundations would be very heavy; either the present mound would have to be removed, or else the foundations would require

to be carried down very deep. The suggested suspension bridge over the cemetery would be exceedingly costly and possibly unsightly. If the cathedral is placed as has been suggested, the orientation will be contrary to the immemorial traditions of the English Church. A practical objection to this proposal is that the sunlight striking through the window or windows at the end of the chancel, which would be south, would be a very serious inconvenience to the congregation.

In conclusion, we consider that questions of economy ought not to be allowed to override every other consideration in placing a building which is to stand for all time. A cathedral need not be built in one life time or by one set of donors. We suggest that it would be possible and sufficient for this generation to make the commencement of an entirely worthy work by acquiring a part of what we consider to be the best site (Monument-place), and erecting a portion of the building upon it. This portion might be either the grand west front and nave, taking up the frontage to Monument-place, and extending back to Anson-street, or it might be the chapel and transept portion which would stand on the cheaper land, eastwards, with a temporary west entrance from Anson-street.

In matters of vast importance such as this, the only thing worth aiming for is the best, and it is our experience that, in the long run, this is the most easily obtainable.

Signed on behalf of the Society,
 FRED M. SIMPSON, President,
 HASTWELL GRAYSON, } Joint
 GILBERT FRASER, } Hon. Secretaries."

THE LONDON COUNTY COUNCIL.

The London County Council reassembled on Tuesday at Spring-gardens after the usual Whitson recess, the Chairman, Mr. A. M. Torrance, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Chelsea Borough Council 6,920*l.* for paving works, and 2,000*l.* for street improvement; Hackney Borough Council 50,000*l.* for electric light installation and street lighting; Hammer-smith Borough Council 2,510*l.* for paving works; St. Pancras Borough Council 50,000*l.* for electric light installation; Southwark Borough Council 13,980*l.* for electric light installation; Hampstead Borough Council 9,525*l.* for similar purposes; Kensington Borough Council 19,920*l.* for paving works; Stepney Borough Council 380*l.* for electric light installation; Fulham Borough Council 30,000*l.* for erection of baths and washhouses; and Hampstead Borough Council 15,000*l.* for extension of cemetery.

Richmond Hill View.—Mr. Burns, M.P., asked whether, in view of the probable loss to London and the suburbs of the beautiful view from Richmond Hill, the Committee would take into consideration the advisability of co-operating with the Richmond Corporation, the Middlesex County Council, the City Corporation, or the Metropolitan Public Gardens Association in order that the people of London might have secured to them for all time the permanent enjoyment of that view.

Mr. H. Clarke said that Richmond Park itself was saved in the early part of last century by the City Corporation.

Lord Monkswell, Chairman of the Parks Committee, said the Committee and the Council had the question of open spaces quite as much at heart as the City Corporation.

New Open Space.—The Parks Committee reported that they had purchased the garden at Albert-square, Commercial-road, under compulsory powers, for 10,500*l.*, the amount of the umpire's award. The valuations on behalf of the Council ranged from 7,603*l.* to 8,250*l.*, the scaled offer amounting to 8,750*l.*

Improvements.—The following recommendations of the Improvements Committee were agreed to:—

"That the estimate of 1,300*l.* submitted by the Finance Committee be approved, and that, subject to an agreement to be prepared by the solicitor, and to the Council of the Metropolitan Borough of Wandsworth agreeing to contribute one-third of the net cost, the freehold interest in the strip of land needed for widening Garratt-lane to 54 ft. at St. Andrew's Church be acquired by the Council.

That the estimate of 1,000*l.* submitted by the Finance Committee be approved; that the Council's statutory consent be given to the widening of

Streatham High-road at the Drew estate, proposed to be undertaken by the Council of the Metropolitan Borough of Wandsworth; and that a contribution be made by the Council on the usual conditions of one-half of the net cost.

That the supplemental estimate of 1,436*l.* 13*s.* 4*d.* submitted by the Finance Committee be approved, and that in connexion with the widening of Russell-street, Drury-lane, now being undertaken by the Council of the City of Westminster, an additional contribution of 1,436*l.* 13*s.* 4*d.* be made by the London County Council.

That the estimate of 375*l.* submitted by the Finance Committee be approved, and that a contribution be made on the usual conditions of one-half of the net cost of the widening of Shattisbury-avenue at its junction with New Oxford-street, proposed to be undertaken by the Council of the Metropolitan Borough of Holborn."

By-law as to Flash Lights.—The Local Government and Taxation Committee reported as follows:—

"We report, for the information of the Council, that at the Clerkenwell Police-court, on May 22, Messrs. Baker & Co., tobacconists, of Pentonville-road, were summoned by the police for 'unlawfully exhibiting a flash light so as to be visible from Pentonville-road, and to cause danger to the traffic,' contrary to the Council's by-laws. The flash light in question was an advertisement which took the form of a block of letters across the front of the shop, 10 ft. above the footway. Each letter was flashed in turn until the whole sign was illuminated, and then the light suddenly went out, and the process was repeated. The only evidence of 'danger to the traffic' was that given by the police. In the result, the magistrate found that the flash light was a source of danger, and imposed a fine of 40*s.* This is, we believe, the first case in which proceedings have been taken under the Council's by-law as to flash lights, and it is of interest, in view of the fears which were entertained that the words 'to cause danger to the traffic,' which were added at the instance of the Home Secretary, would render the by-law inoperative."

Common Lodging-houses.—The Public Health Committee submitted a Report recommending:—

"That the Parliamentary Committee be instructed to seek legislation in the next Session of Parliament to provide—

(a) That no person shall keep a common lodging-house in London without obtaining annually a licence from the Council.

(b) That, for the purpose of making and amending the regulations or by-laws within the County of London from time to time, the provisions of the Public Health Act, 1875 (Section 80), be substituted for those of the Public Health Act, 1848 (Section 66), mentioned in Section 9 of the Common Lodging Houses Act, 1851, and that words be added to enable the Council to make by-laws for the inspection and enforcing of proper drainage in common lodging-houses.

(c) That Section 3 of the Common Lodging Houses Act, 1853, be amended so that, when a registered keeper dies, his widow or other relation, or person acting in the care or management of the house after his death, shall, as a condition of being allowed to keep the house for four weeks as in the section provided, give immediate notice of such death to the Council.

(d) That the Council shall have the like powers as are conferred by the Public Health (London) Act, 1891, upon sanitary authorities for examining as to the existence in a common lodging-house of any nuisance, and for obtaining closing orders or otherwise abating any nuisance which may be found to exist therein.

(e) That all penalties imposed shall, notwithstanding any provision contained to the contrary in the Act 2 and 3 Vict., cap. 71, or in any other Act or Acts, be paid to the Council."

The recommendations were agreed to.

Theatres, &c.—On the recommendation of the Theatres and Music Halls Committee the following applications were agreed to:—

Seating on ground floor of the Grand Hall, Clapham Junction (Mr. E. A. E. Woodrow).
 Plan in regard to the Great Eastern Hotel (Mr. T. Holloway).

Imperial Hall, Dulwich (Mr. J. W. Brooker).

Plans in regard to the entertainment hall in Picturesque England at the London Exhibitions, Earl's Court (Mr. A. O. Collard).

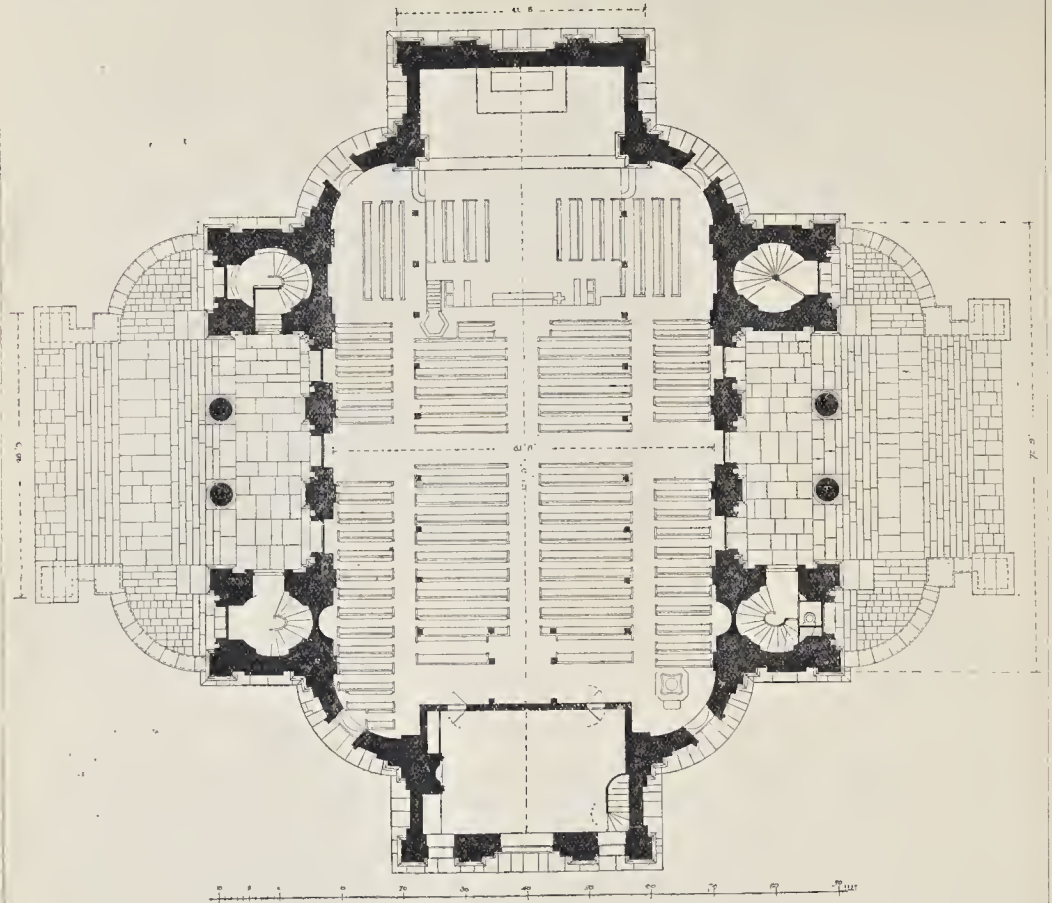
Proposed extension of the East London Technical College at the People's Palace, Mile End-road, E. (Mr. C. Reilly).

Proposed addition to the meter-room in Sadler's Wells Theatre, Rosebery-avenue (Mr. Andrew).

Plans submitted by Messrs. Fladgate & Co. in regard to the Savoy Theatre, Strand.

Greenwich Tunnel Works.—The Bridges Committee reported as follows:—

"We have to inform the Council that on the 26th ult. the shield at Greenwich tunnel reached the Greenwich shaft, and an opening was made



Plan of St. John's Church, Westminster. Measured and Drawn by Mr. A. Wyatt Papworth.

to allow a passage from the tunnel to the shaft, and by the end of the month the junction was made perfectly secure. The actual tunnelling work is now complete, save for the special ring at the junction with the inside plates of the Greenwich shaft. The rate of progress from the commencement of the work, including time lost for holidays, has been 5 ft. 6 in. per day, or 33 ft. per week, for a period of thirty-six weeks. It is very satisfactory to have to report that the work has been carried on with very few accidents, and there were only three cases of compressed air sickness of sufficient gravity to deserve compensation from the Council."

The Supply of Electricity in Bulk.—The Highways Committee recommended that the Council should instruct the Parliamentary Committee to prepare the draft of a Bill, on the lines of the suggested clause agreed to at the recent conference of local bodies, relative to the purchase by local authorities in combination with each other, or by the London County Council, of undertakings for the supply within the county of London of electricity in bulk; and that such Bill should be submitted in draft for the consideration of the Corporation of the City of London and the respective Councils of the City of Westminster and of the several metropolitan boroughs.

This was adopted.
Having transacted other business, the Council adjourned.

ELECTRIC LIGHT EXTENSION, BECKENHAM.—An inquiry was held at the Beckenham Council Offices recently by Mr. M. K. North, A.M.Inst.C.E., one of the Local Government Board Inspectors, into the application of the Beckenham Council to borrow 20,000*l.* for the extension of the electric light at Beckenham, 780*l.* for purposes of street improvement, and 275*l.* for the public baths. Mr. Reginald P. Wilson, consulting electrical engineer, presented the details of the proposed extension.

Illustrations.

PROPOSED HIGH ALTAR, REREDOS, AND BALDACCHINO, ST. ANNE'S CATHEDRAL, LEEDS.

THE reredos, of which we give an illustration, is divided into niches with richly carved canopies over them. In the centre is the throne for exposition and benediction, approached by a staircase from the ambulatory. Above the throne is a panel with the coronation of the Virgin carved in low relief and decorated. Over the whole is a lofty baldacchino supported on two columns.

The altar itself is to be executed in purple Breccia marble, with a frame of white alabaster inlaid with mother of pearl; the cross in the centre inlaid with porphyry and lapis lazuli.

The tabernacle is to be in white alabaster with beaten copper door.

The super-altar is to have Bianca, Nero, and Connemara green marbles, and the whole will be on a plinth of black marble.

The reredos is to be executed in first quality pine, with canopies and carved posterns in very fine kauri pine. The baldacchino is to be executed in the same material, but the columns to have iron slanchions cased in kauri pine. The whole of the woodwork will be painted and decorated.

ST. JOHN'S CHURCH, WESTMINSTER.

We publish an elevation and section of Archer's celebrated church of St. John at Westminster, the plan of which is also subjoined. The drawings are by Mr. A. Wyatt Papworth, and form a portion of a set for which he was awarded a medal of merit and five

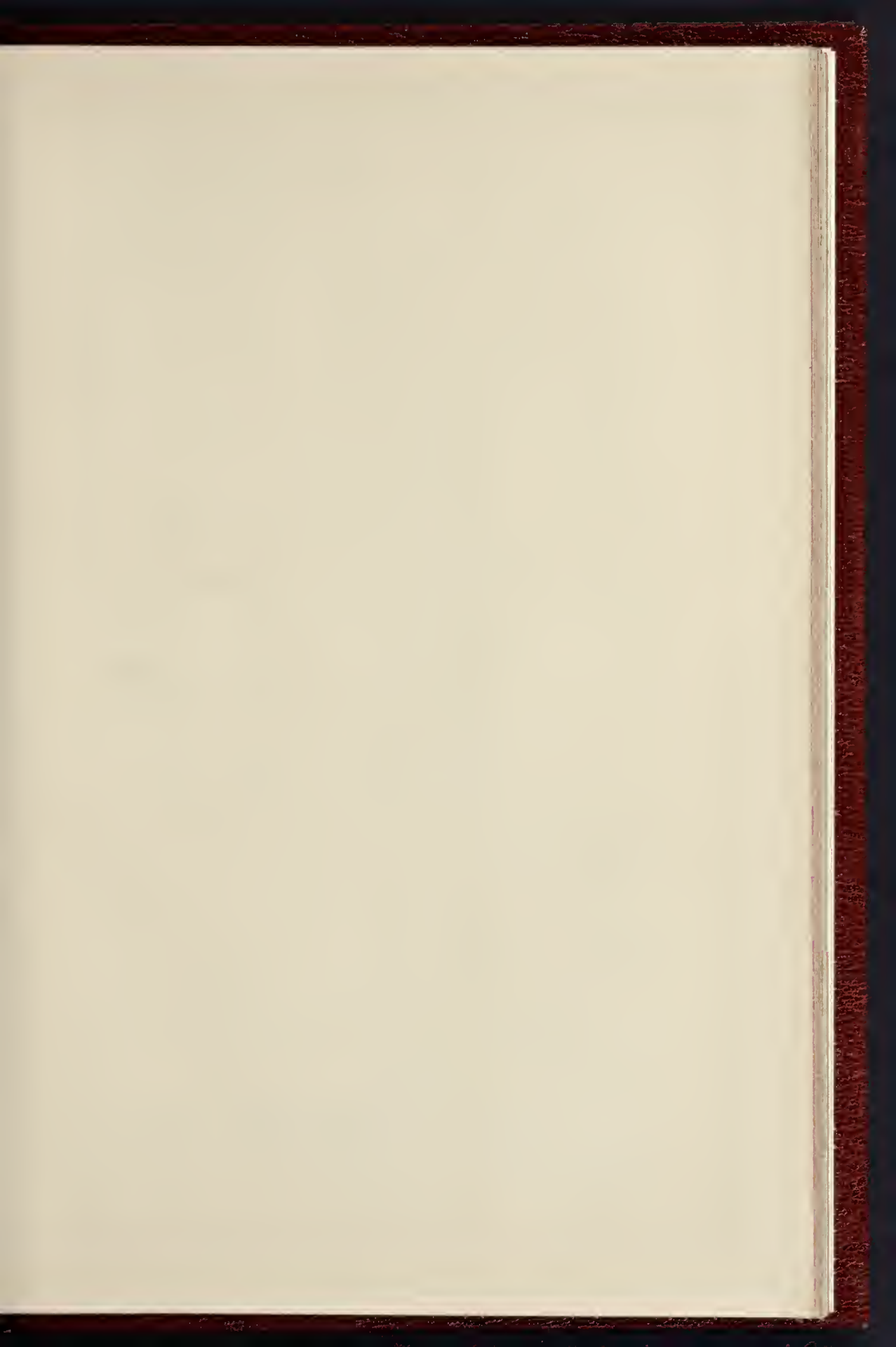
guineas in the last silver medal competition for measured drawings at the Institute of Architects.

The church stands in the centre of the site proposed to be dealt with under a Westminster improvement scheme, and should, from its position, form almost the central and governing point of any plan for the laying out of that portion of Westminster. On the other hand, one never knows what destructive measures may be carried out in these days in connexion with so-called improvement schemes, and therefore we may as well take an opportunity of putting a record of the church in our pages in case of the worst.

The history of the fabric is noteworthy. It is the second of the "fifty churches" erected by the Commissioners to whom Sir John Vanbrugh (*obit* 1726) was surveyor. He entrusted the design to his pupil, Thomas Archer. The church was built in 1721-8 (see the Act 1 Geo. II., 2nd Session, c. 15) for a parish which had been taken out of St. Margaret's, at a cost of 40,000*l.* (*este* Allen's "London," vol. iv., 1828). In the "Crowle" Pennant are two prints, cut down for mounting, but lettered as follows:—

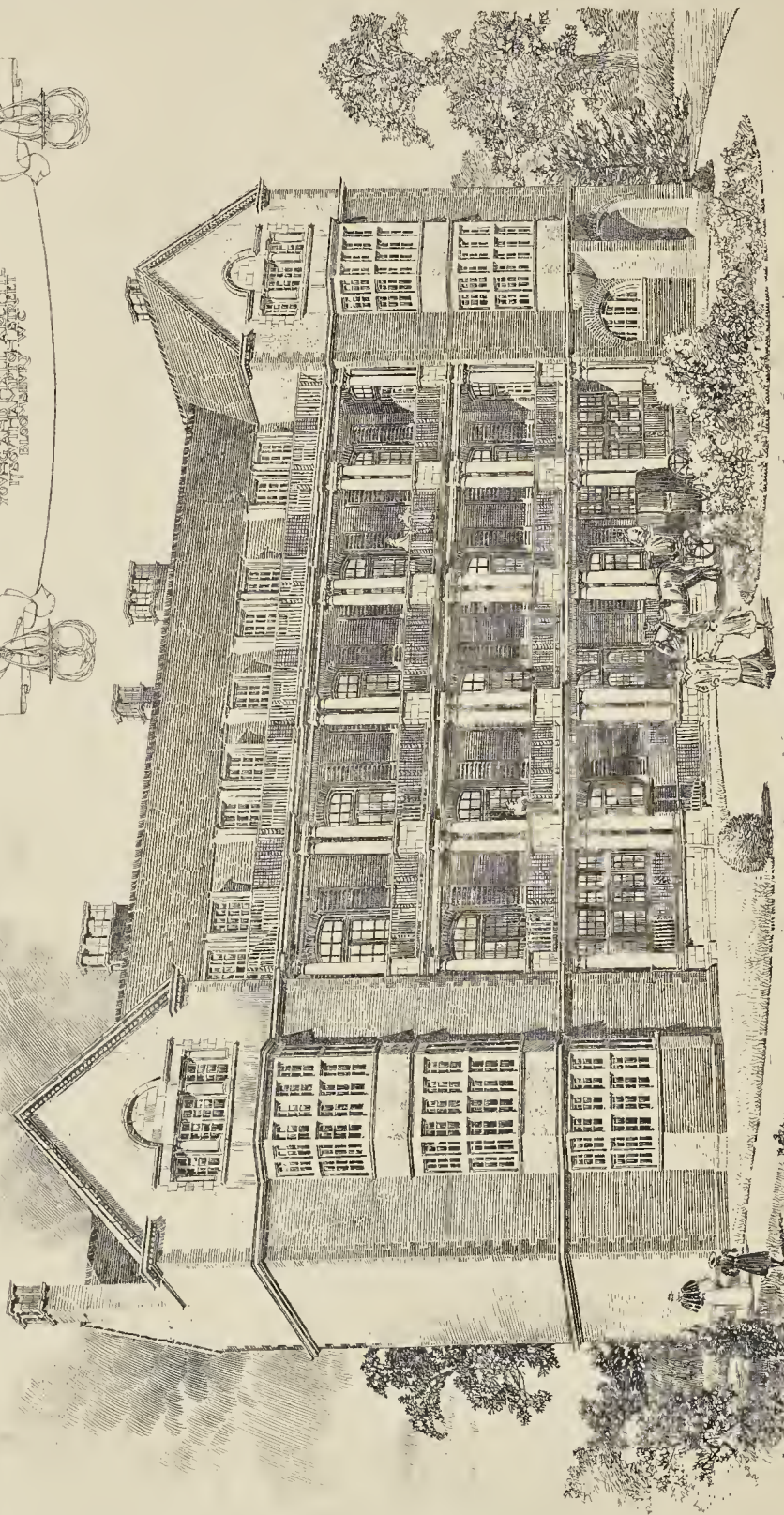
"Mr. Archer's design of St. John's Church in Westminster, as it was resolved upon by the Commissioners. The alterations made since to this design [both to the steps and pinnacles] were done without the consent or knowledge of Mr. Archer."

Elmes records that Archer had in mind to build also a central tower with spire; but the plan and structure of the building present no foundation for a feature of that kind, unless we may suppose that Archer intended to supplement the four towers with a timber spire or flèche rising from the roof. The two prints when contrasted with the existing church show that the departure from Archer's own designs



THE BUILDER, JUNE 22, 1901.

HOSPITAL FOR EPILEPSY
AND PARALYSIS
PROPOSED NEW BUILDING, MAINDA VALLE
ZOUSS AND KILBY ARCHT.
BLOOMINGTON, ILL.



HIGHER GRADE SCHOOL
 CASSLAND ROAD
 HACKNEY
 FOR THE
 LONDON SCHOOL
 BOARD
 T. J. BAILEY & SONS, ARCHT.
 1901

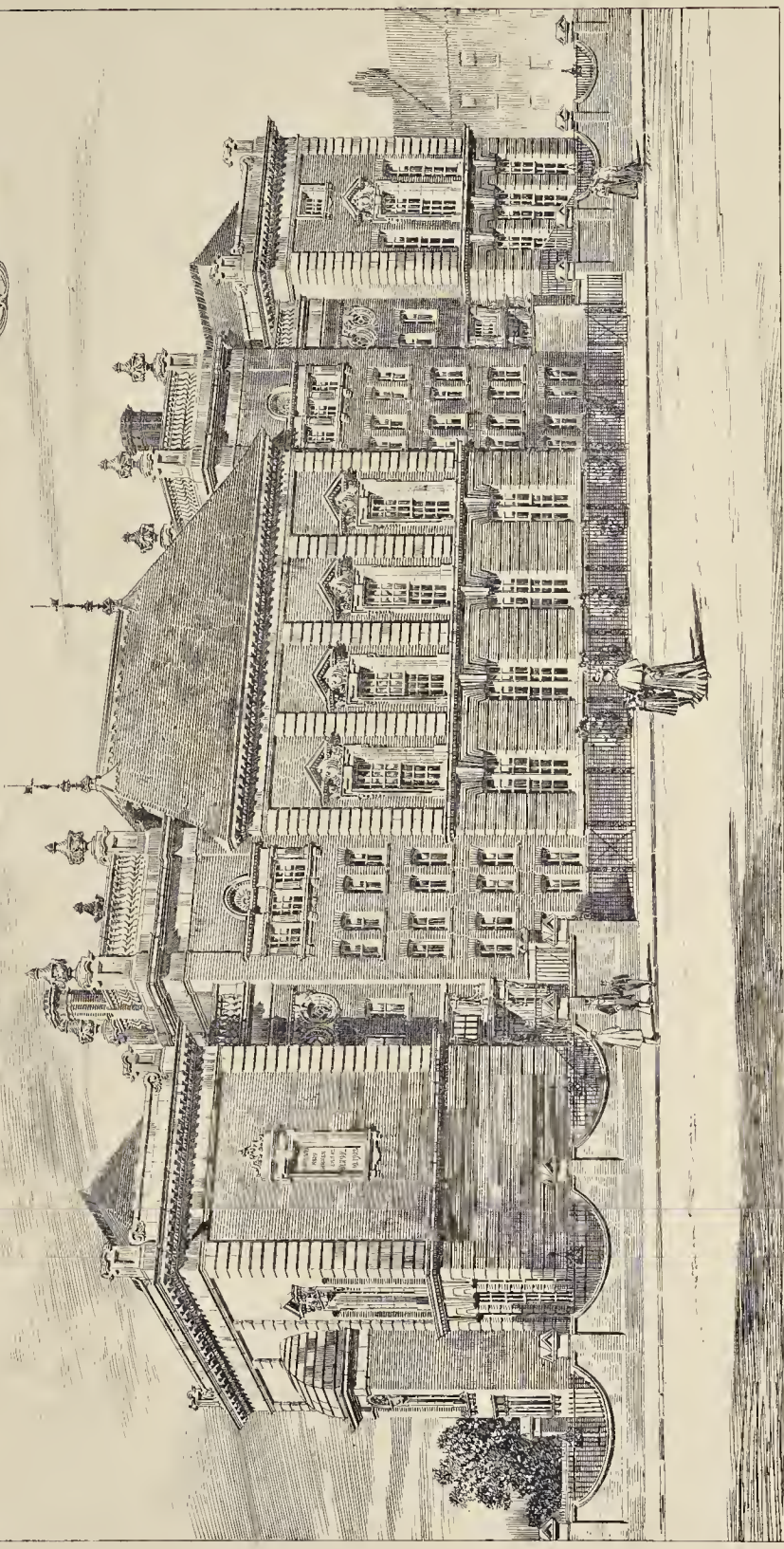
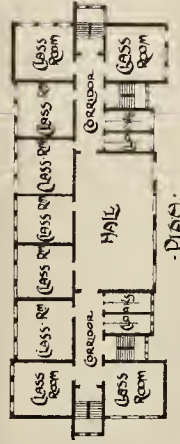
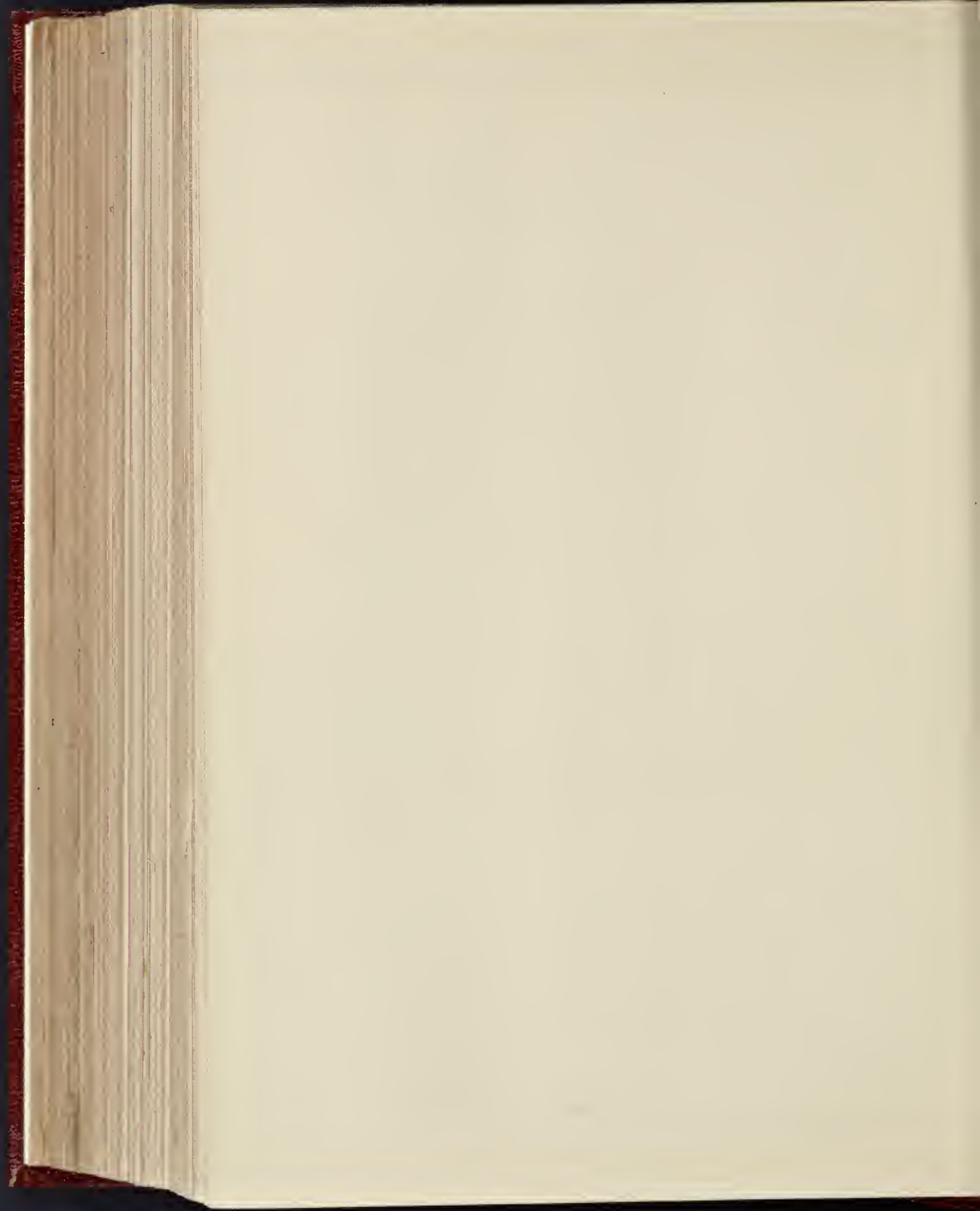
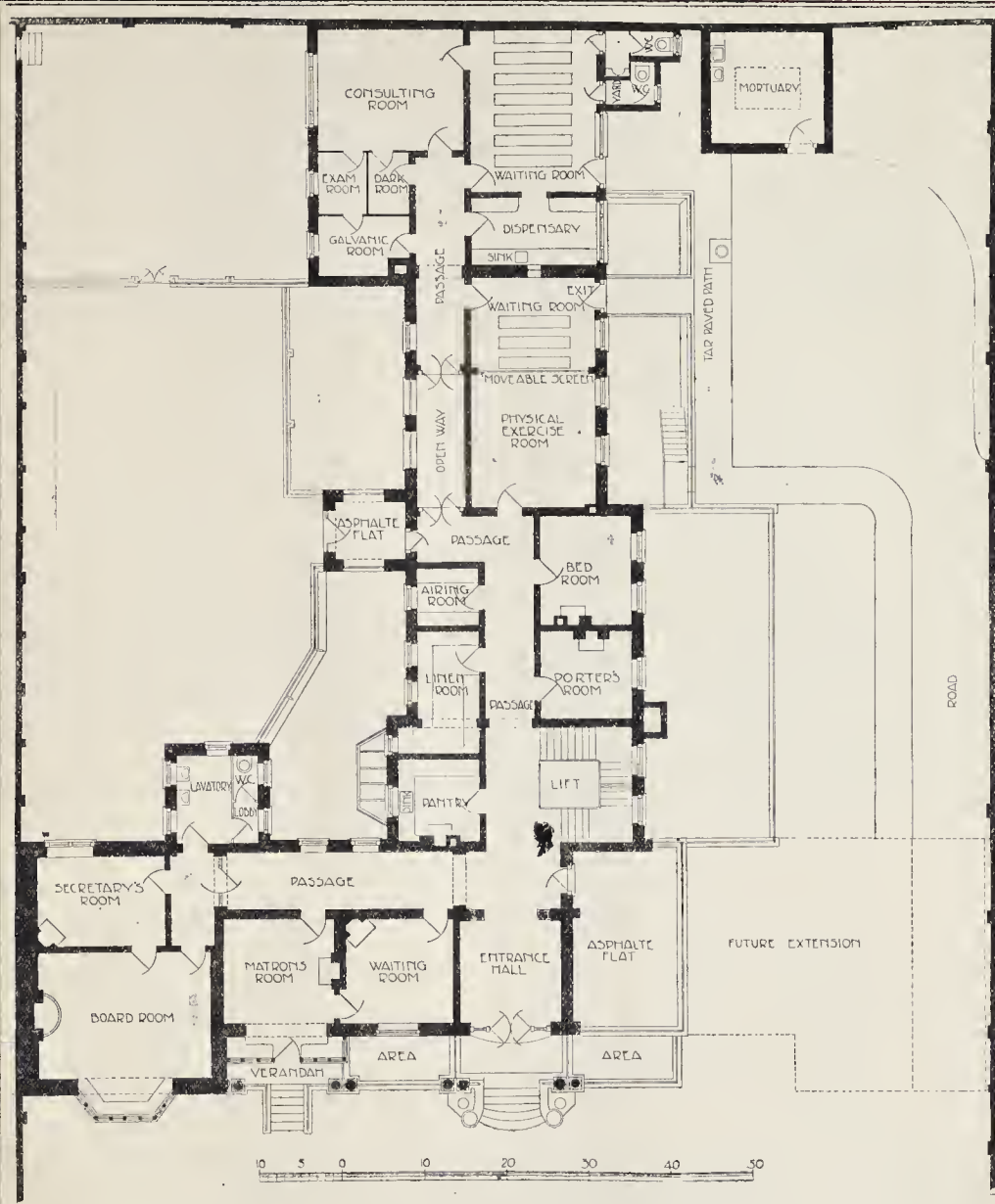


PHOTO-LITHO SPRAGUE & CO. BY 4 & 5 EAST HARDING STREET, PETER LANE E.C.





Hospital for Epilepsy and Paralysis, Maida Vale. Ground Plan.

[See next page.]

mainly affected the treatment of the broken pediments above the porticos; the four towers, which are now rounded on plan; and the stylobate and steps. A story has gained currency that the four towers were added through necessity to give stability to the fabric, as the work of its building proceeded, and did not form part of the original design. But it is quite clear that they did. In respect of the altered towers, Archer's design shows them as square on plan; his arrangement of columns and entablature for the towers has been modified, whilst instead of the present bell-shaped leaden cupolas capped with cones he has at their four angles turrets with pilasters connected by a balustrade, and each of them is terminated with an obelisk finial. The model was deposited in the collection stored over Henry V.'s monument in Westminster Abbey. The structure was tied together with iron bars

passed through the walls and columns both internally and externally. The latter bars have been retained.

Allen cites a painting, preserved in the vestry, of the fabric as it appeared after the interior had been destroyed by a fire that broke out on September 26, 1742. The flames consumed the roof, together with the grouped columns at the angles. The House of Commons voted 4,000*l.* for a reparation of the building; the grouped columns, however, were not replaced. William Inwood effected some alterations and re-arrangements; he removed the columns for supporting the ceiling, and increased the seating capacity in the galleries, added in 1758, and on the floor, for from 1,200 to 1,800 persons. A partial restoration, with re-decoration of the interior, was carried out subsequently by P. C. Hardwick and Sir Arthur Blomfield. Then, in 1885, the interior

fittings were re-modelled and the old pews taken away, at a cost of about 800*l.*, under Butterfield's directions and superintendence.

About ninety years ago, Mr. T. Green, of Millbank-row, gave some old painted glass, brought from Normandy, for the side lights of the east window; in 1827 a copy of the picture of Christ carrying the Cross, variously attributed to Moralez or Ribalta, over the altar-piece in the chapel of Magdalen College, Oxford, was presented to the church. In 1840 Hill rebuilt the organ (1727); the font (April, 1847) was sculptured by John Thomas, after a design by Barry.

HOUSE, "THE TOWERS," DEVONSHIRE.

This house is built of red brick and tiles; the half-timbering is of oak unpainted, portions of this being filled in with herring-bone brick-

work. The stone dressing is of Portland stone. Leaded lights are used throughout in the windows.

Internally the decoration is of a simple character. The woodwork is pine, stained a very dark green.

Messrs. C. R. Dibdin and H. F. Waring are joint architects.

HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE.

THE new building which is in course of erection in Maida Vale is intended to take the place of the house now occupied by the Charity in Portland-terrace, Regent's Park. Ultimately it is intended to provide accommodation for some fifty-four patients, but the scheme at present in hand provides only for thirty-five, and for lack of funds the Committee are only able at present to enter into a contract for the completion of the building up to the first floor level.

The whole of the kitchen offices and stores are in the basement. The ground floor contains the administrative offices and the out-patient department. The first and second floor will each contain a ward for seven beds, one for eight beds, and four wards of one bed each, together with ward kitchen, bathroom, and the usual sundry offices, a dayroom for epileptic patients, and a wide balcony on to which patients in bed can be wheeled. On the top floor are the quarters for nurses and servants, together with the sitting-room for the nurses.

The architects are Messrs. Young & Hall; the contractors Messrs. Prestige & Co.; and Mr. Gathergood acted as clerk of works.

CASSLAND-ROAD HIGHER GRADE SCHOOL.

THIS school is being erected by the School Board for London, for the purpose of higher grade teaching, on a site adjoining Hackney Common, and will provide accommodation for 816 children.

Halls and classrooms occupy the ground and first floors.

A drawing classroom with modelling-room, lecture-room, physical laboratory, needlework-rooms, chemical laboratory, gymnasium with dressing-rooms attached, are provided on the second floor.

The school is to be heated and ventilated on the plenum system by Messrs. Stott, of Oldham, the towers being used as extract shafts.

A manual training-room is provided adjoining the school and will accommodate forty boys.

The building is designed in a free treatment of French Renaissance, the walls being faced with red brick relieved by buff terra cotta dressings, and the roofs covered with Broseley tiles.

Mr. Thos. J. Bailey, the Architect to the Board, has designed the building, and it is being carried out under his superintendence by Messrs. Lawrence & Sons, of City-road, E.C., at a cost of 30,594l.

COMPETITIONS.

PUBLIC LIBRARY, KEIGHLEY.—As we have already announced, Mr. Leonard Stokes, the assessor in this competition, awarded the first premium to Messrs. McKewan & Swan, 3, Newhall-street, Birmingham. The second premiated design was by Mr. James S. Gibson, 4, Gray's Inn-square, London, W.C., and the third by Mr. Thomas Dawson, 28, Great Ormond-street, London, W.C.

SHOPS AND HOUSES, DARLINGTON.—In a competition for a row of shops and houses, Park-gate, Darlington, the design by Mr. F. Turner Waddington, Beech-avenue, Blackpool, has been placed first. The second premiated design was by Mr. J. H. Holmes, West End Buildings, Darlington.

BATHS FOR OLD TRAFFORD.—A special meeting of the Stretford District Council was held on the 11th inst. for the purpose of selecting plans for the new baths at Old Trafford. The estimated cost of the baths is about 12,500l., and they will be erected at the junction of Northumberland-road and Hullah Hall-lane. In response to the advertisement for competitive plans, twenty-one sets were sent in, and it was found necessary to appoint an assessor to make the awards, which were confirmed by the Council as follows:—Mr. Charles Thos. Taylor, Clegg-street, Oldham,

and Mr. Arthur Warburton, of Warrington, thirty guineas; Mr. Arthur R. Groom, architect, Manchester, twenty guineas; and Messrs. Farrar & Woodhouse, architects, Manchester, ten guineas. On the motion of Mr. Talbot (Chairman of the Baths Committee), seconded by Mr. Walthew, it was resolved to erect the baths from plans submitted by Messrs. Farrar & Woodhouse.

BOARD SCHOOL, LOUGHBOROUGH.—At the last monthly meeting of the Loughborough School Board, the clerk laid before the committee the report of Mr. Evans on the plans sent in for the proposed new Board school, cookery school, and pupil teachers' centre, from which it appeared that Mr. Evans had awarded the first place to Alpha No. 1, and the second place to Alpha No. 2. The clerk reported that both these plans were sent in by Messrs. Barrowcliff & Alcock. It was thereupon resolved to award the premium offered of 25l. to Messrs. Barrowcliff & Alcock. The further consideration of the plans was adjourned, and it was resolved, with the consent of the architects competing, to invite the ratepayers to inspect the plans, and to place the same on view in the board-room.

ARCHITECTURAL SOCIETIES.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.—A deputation from the Council of the Royal Institute of the Architects of Ireland waited on the Local Government Board on the 14th inst. The deputation consisted of Sir Thomas Drew, J. Rawson Carroll, R. Caulfield Orpen, Charles A. Owen, and W. Kaye Pary, Hon. Secretary. The object of the deputation was to bring under the notice of the Local Government Board the appointments of unqualified men as architects by the Urban and Rural District Councils in connexion with the expenditure of public funds. The deputation was courteously received by the Vice-President, Sir Henry Robinson, K.C.B., and other members of the Board. Sir Thomas Drew stated shortly the position occupied by the Royal Institute in connexion with the profession which it represented. Mr. W. Kaye Pary then read a statement embodying the views of the Council, and suggested that the Local Government Board should endeavour to secure increased powers to make regulations regarding the qualifications of architects employed by Urban and Rural District Councils. The Chairman thanked the deputation for having brought this matter under the notice of the Board, and added that the suggestions of the Council would be very carefully considered. The deputation then withdrew.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage and Projections.

Kensington, South.—One-story shops at Nos. 28, 30, and 32, Harrington-road, Kensington, at the corner of Queensberry-place (Mr. F. E. Williams for Lord Ashburton).—Consent.

Hampstead.—Residential flats, with projecting one-story shops and bay-windows, on the west side of Finchley-road and east side of Fortune Green-lane, Hampstead (Mr. G. H. Green for Mr. W. H. Pearce).—Consent.

Hammersmith.—A theatre building on the north side of Hammersmith-road, Hammersmith, at the corner of Rowan-road (Mr. W. G. R. Sprague for Mr. J. B. Mulholland).—Consent.

Camberwell, North.—A one-story addition on part of the forecourt of No. 243, Camberwell-road, Camberwell (Mr. W. V. Goad for the executors of the late Mr. C. Goad).—Consent.

Chelsea.—That the application of Mr. J. Ross for an extension of the periods within which the erection of buildings upon plots Nos. 1 to 4, Cheyne-walk, Chelsea, to abut upon Beaufort-street, was required to be commenced and completed, be granted.—Agreed.

Marylebone, West.—A porch at the entrance to No. 33A, Montagu-square, St. Marylebone, to abut upon Upper Montague-street (Mr. L. Stokes for Mr. J. Roskill).—Consent.

Strand.—A projecting metal sign at the Peninsular and Oriental Steam Navigation Company's premises on the North side of Northumberland-avenue, Charing-cross (Mr. T. E. Colcutt for the company).—Consent.

Greenwich.—A house on the south side of Manor-way, Lee-road, Greenwich (Mr. L. V. Hunt).—Consent.

Dulwich.—A one-story shop on the east side of Crystal Palace-parade, Dulwich, near Anerley-road (Mr. W. Harbrow for Messrs. T. Prime & Sons).—Consent.

Kensington, South.—A wooden oriel window at the ground floor level in front of No. 10, Albert-place, Victoria-road, Kensington (Mr. T. W. Heath for Colonel J. P. Westmoreland).—Consent.

Lewisham.—Two houses on the west side of Shell-road, Lewisham, at the corner of Sandrock-road (Messrs. Hodson & Whitehead for Messrs. Hodson Brothers).—Consent.

Pekham.—One-story shops on the forecourts of Nos. 20, 22, 24, and 26, Atwell-road, Rye-lane, Peckham (Mr. A. E. Mullins for Mr. W. Monks).—Consent.

Rotherhithe.—A gangway to connect, at the second floor level, No. 27, St. Thomas-street, Bermondsey, with the viaduct forming the approach to London Bridge Railway Stations, and spanning Joiner-street (Messrs. De Clermont & Donner).—Consent.

St. George's, Hanover-square.—Retention of a one-story office building erected on the forecourt of Victoria Wharf, Buckingham Palace-road, Piccadilly (Messrs. Humphreys, Limited).—Consent.

St. Pancras, East.—An addition to No. 86, King's-road, Camden Town, to abut upon Camden-road (Messrs. Taperell & Haase, for Mr. A. Hilger).—Consent.

Hammersmith.—That the application of Messrs. Dale & Gadsden for an extension of the periods within which the erection of thirteen one-story shops on the east side of Balham High-road, between Nos. 207 and Elmfield-road, was required to be commenced and completed, be granted.—Agreed.

Woolwich.—That the application of Mr. R. Stewart for an extension of the periods within which the erection of eighteen houses on the north side of Bexley-road, Ethham, eastward of Elderside-road, was required to be commenced and completed, be granted.—Agreed.

Hampstead.—That the application of Messrs. Boehmer & Gibbs for an extension of the period within which the erection of one-story shops on part of the forecourts of Nos. 1 to 13 inclusive, College-brescent, Finchley-road, Hampstead, was required to be completed, be granted.—Agreed.

Brixton.—The rebuilding of the Russell public-house and No. 114, Brixton-road, Lambeth (Messrs. J. A. J. Woodward & Sons for Mr. A. White).—Refused.

Hammersmith.—Buildings on the site of Nos. 1 to 12, Theresa-terrace, King-street, Hammersmith (Messrs. Boehmer & Gibbs for Messrs. H. & E. Lea).—Refused.

Strand.—An iron and glass hood over the entrance to Nos. 17 and 19, Old Compton-street, Sobo (Mr. R. H. Kerr for Mr. C. Brice).—Refused.

Wandsworth.—Two-story houses on the north-west side of North-street, Wandsworth (Mr. H. Bignold for Mr. S. B. Jones).—Refused.

Width of Way.

Bermondsey.—Buildings on the site of Nos. 30 to 42, Bermondsey-square, and No. 58, Long-walk, Bermondsey, at less than the prescribed distance from the centre of Long-walk (Mr. E. Crosse for Messrs. W. Pettitt & Sons).—Consent.

Southwark, West.—A building on the open yard on the north-east side of Mansfield-street, Borough-road, Southwark, at less than the prescribed distance from the centre of the street (Mr. C. H. Shoppee for Messrs. R. How & Co.).—Consent.

Islington, West.—A three-story building, to be inhabited by persons of the working class, on the south side of George-street-mews, Holloway, at less than the prescribed distance from the centre of the street (Mr. W. L. Kellaway for Mr. S. Allen).—Refused.

Woolwich.—A one-story building at Warren-lane Works, High-street, Woolwich, at less than the prescribed distance from the centre of the street (Messrs. Kirk & Randall).—Refused.

Width of Way, Lines of Frontage, and Projections.

Hackney, North.—Buildings, with one-story shops in front, on the west side of High-street, Stoke Newington, and of buildings on the south side of Victoria-road (Messrs. N. S. Joseph, Son, & Smithless, for the Four Per Cent. Industrial Dwellings Company, Limited).—Consent.

Marylebone, East.—The retention of a wood and zinc pent over the entrance to No. 22, Devonshire-place-mews, St. Marylebone (Mr. A. G. Langdon for Messrs. R. Hardy & Son).—Consent.

Woolwich.—The re-erection of the Duke of York and Fortune of War public-houses, and Nos. 16 to 38 (even numbers only, inclusive), New-road, Woolwich (Messrs. Church, Quick & Whincop for Mr. E. H. de Bertodano, Mr. A. Fort and Mr. T. Sturgeon).—Refused.

Fulham.—An open shed and a coal store at the rear of No. 14, Fulham Palace-road, Fulham, to abut upon Waldo-avenue (Mr. H. Bignold for Mr. F. Jenkins).—Refused.

Notwood.—A one-story addition at the rear of No. 6, Gloucester-street, Notwood, to abut upon Eadman-street (Mr. H. Bignold for Mr. J. F. Wheeler).—Refused.

Width of Way and Space at Rear.

Southwark, West.—A block of dwelling-houses, intended to be inhabited by persons of the working class, on the site of Nos. 32, 34, 36, 38, and 40, Holland-street, Southwark (Mr. E. Hoole for Miss Octavia Hill).—Consent.

Woolwich.—Four houses on the west side of Barnfield-road, Plumstead (Mr. H. Roe for Mr. W. Sutch).—Refused.

Projectious and Construction of Gangways.

Bow and Bromley.—That the application of Mr. Max Clarke for an extension of the periods within which the erection of four iron gangways across Fawcett-street, Poplar, to connect warehouses on the opposite sides of that street, was required to be commenced and completed, be granted.—Agreed.

Poplar.—An overhead transporter, to be constructed of steel and wood, across East Ferry-road, Poplar, near its junction with Giellang-rod, with an iron roof over such transporter (the Millwall Dock Company).—Consent.

Lines of Frontage and Construction of Building.

Hackney, Central.—The retention of a wood and glass show-case on the forecourt of No. 54, Mare-street, Hackney (Mr. T. Fisher).—Consent.

Width of Way and Construction of Gangway.

Southwark, West.—A warehouse building on the west side of Valentine-place, Southwark, at less than the prescribed distance from the centre of Pontypool-place, and of a gangway to connect such building with a warehouse building on the south side of Pontypool-place (Messrs. J. Hoare & Son for Messrs. J. Pascall, Limited).—Refused.

Formation of Streets.

St. Pancras, North-†.—That an order be issued to Messrs. Boehmer & Gibbs refusing to sanction the formation or laying-out of streets for carriage traffic on the Clevedon estate, Highgate-road, St. Pancras (for Mr. A. W. Armstrong).—Agreed.

Hackney, South.—That an order be issued to Messrs. Gordon & Gunton refusing to sanction the widening and adaptation for carriage traffic of a footway leading out of the west side of Gomer-terrace, Upper Clapton-road, Hackney, and known as Cassimer-terrace (for Messrs. Abbott).—Agreed.

Deviations from Certified Plans.

St. George, Hanover-square.—Certain deviations from the plan certified by the District Surveyor so far as relates to the proposed erection of a stable building, with a warehouse over, on a site at the rear of No. 47 and 48, Wilton-road, Pimlico (Messrs. J. Bartholomew & Co. for Mr. C. T. Cowley).—Retained.

Artisans' Dwellings.

Hackney, North.—Dwelling-houses, to be inhabited by persons of the working class, and proposed to be situated on a street, on a site on the west side of High-street, Stoke Newington, at the corner of Victoria-road (Messrs. N. S. Joseph, Son, & Smithem for the Four Per Cent. Industrial Dwellings Company, Limited).—Consent.

Hackney, North.—Dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the south side of an unauthorised street, known as Gibson's-buildings, Northwold-road, Stoke Newington (Mr. R. L. Cole for the Metropolitan Association for Improving the Dwellings of the Industrial Classes).—Refused.

Height of Buildings.

Whitechapel.—Two buildings of the warehouse class on the north-west side of Tripe-street, Middlesex-street (formerly Sandy's-row), Whitechapel, to exceed in height the width of Tripe-street (Messrs. D. Cubitt Nichols, Sons, & Chuter for Messrs. G. H. & A. Bywaters).—Consent.

Battersea.—Three warehouses, to exceed 80ft. in height, at Messrs. Hampton & Sons' premises, Queen's-road, Battersea (Messrs. Hesketh & Stokes for Mr. G. Hampton).—Refused.

Buildings for the Supply of Electricity.

Woolwich.—An addition to the generating station and works at Globe-lane, High-street, Woolwich (Messrs. Church, Quick, & Willcock for the Woolwich District Electric Light Company, Limited).—Consent.

Means of Escape from Top of High Buildings.

Holborn.—Means of escape in case of fire on the fifth and sixth floors of the Kingsley Hotel, Hart-street, Bloomsbury, for the persons dwelling or employed therein (Mr. C. F. Doll for Mr. J. Truslove).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

THE STUDENT'S COLUMN.—Our Student's Column article, "Sanitary Fittings and Plumbing," is unavoidably held over until next week.

Correspondence.

To the Editor of THE BUILDER.

THE SPECIAL TELEPHONE DIRECTORY.

SIR,—In November, 1898, we paid a deposit to the owners of the Special Telephone Directory in respect of advertisements. Have any of your readers paid deposits about the same time? If so, we shall be glad to hear from them.

ROBERTS, ADLARD, & CO.

25, Bernoldsey-wall, S.E.

REVOLVING ENTRANCE DOORS.

SIR,—Can you or any of your readers kindly oblige us with the address of the makers (or their London agents) of revolving entrance doors to prevent draught. We believe they are an American patent, and are in use at one or two of the London hotels.

ENTRANCE DOORS.

BOOKS RECEIVED.

OFFICE MANAGEMENT: A MANUAL FOR ARCHITECTS AND ENGINEERS. By W. Kaye Barry. (E. & F. N. Spon.)

A PRICE-BOOK FOR ARCHITECTS AND ENGINEERS. By T. E. Coleman, F.S.I. (E. & F. N. Spon.)

WEIGHTS AND MEASUREMENTS OF SHEET LEAD. By James Alexander. (E. & F. N. Spon.)

THE MASTABA OF PTAHHEP AND ARHETHETEP AT SAQQAREH. Ninth Memoir of the Archaeological Survey of Egypt. By N. de G. Davies, M.A. (Kegan Paul, Trench, Trübner & Co.)

A HISTORY OF DESIGN IN MURAL PAINTING. By N. H. J. Westlake, F.S.A. Part 1. (J. Parker.)

GENERAL BUILDING NEWS.

ST. LUKE THE EVANGELIST'S, WALTON, LIVERPOOL.—The new church of St. Luke the Evangelist, Goodison-road, Walton, was dedicated on the 13th inst. The plan of the church consists of nave, north and south aisles, north and south transepts, chancel, organ chamber, and choir and clergy vestries. The chancel aisle is not built at present. There are two entrances from Goodison-road, one from the north-west and the other from the south, leading into a narthex, separated from the nave by a glazed screen. The font is at the west end of the nave adjoining the narthex screen. The total length of the church is 123 ft. 2½ in., and the total width 52 ft. 6 in. across nave and aisle and 60 ft. across transepts. The church is built of local brick with red stone jambs and mullions in windows, with Runcorn brick plinth quoins and bands, and terra cotta finials, &c. The columns to the nave arcade are of Runcorn stone. The whole of the constructional woodwork is of pitch pine. The choir pews, reading-desk, and altar table are of oak. The reredos is only a part of what is to be in the future, the central panel being a gift. The church throughout is seated with chairs, and will accommodate nearly 600 worshippers. The flooring of the church is of pitch pine wood block, with the aisles or passages of oak. The chancel and sacristy are laid with mosaic pavement. The church has been erected by Mr. S. Webster, builder and contractor, of Bootle; the heating by Messrs. J. R. Cooper & Sons; the mosaic pavement in chancel by Rust's Vitreous Mosaic Co., London; and the choir seats, &c., by Jones & Willis. The clerk of works was Mr. Gilbert Morris. The architect was Mr. J. Francis Doyle.

RE-OPENING OF CHANCEL, ST. PETER'S CHURCH, DERBY.—The chancel of this church was re-opened recently after renovation and decoration. The roof has been repaired under the direction of the architect, Mr. W. Hawley Lloyd, all the decayed boarding and timber having been renewed. The large timbers, which, in the main, were in sound condition, has been hoisted throughout with oak. The old lead has been recast by Messrs. Cox & Co., and relaid. Defects in the vestry and eastern parapet have been repaired. A tile pavement and Hopton-Wood stone steps have been laid by Mr. W. E. Lomas. In the course of the preparation for this work, two black Derbyshire marble slabs with Latin inscriptions were discovered. These were buried beneath the old pavement of the church, and have now been relaid at the east ends of the north and south aisles. The decoration of the church has been carried out by Mr. J. H. Ottewill, from designs by the architect.

RESTORATION OF HADDON CHURCH, NORTHAMPTONSHIRE.—This church was recently reopened after restoration. Mr. J. C. Traylen, of Stamford, was the architect, and Mr. F. G. Halliday, of Stamford, was the contractor. A new north aisle roof has been erected with transept roof and nave roof; the interior cleaned down, and the tower restored and one bell recast. All the woodwork was done with English oak, and in the rebuilding of the nave roof the old characteristics are being preserved. The windows were reglazed. A stained

glass window, in memory of Lieut. Trewer, has been inserted. The design, which is by Kemp, represents the Crucifixion and St. George and St. Michael. After the walls had been cleaned and several layers of whitewashing removed, a number of frescoes were discovered on the east walls, but unfortunately the treatment to which they had been subjected has made them indecipherable.

NEW CHURCH, PLYMOUTH.—On Wednesday, the 12th inst., the foundation stone was laid of St. Simon's Parish Hall, Plymouth, which will be temporarily used for services while the new church of St. Simon (to seat 1,000) is being erected. The contractor is Mr. Ambrose Andrews, of Plymouth, and the architect Mr. Harbottle Reed, of Exeter, who has also prepared the plans for the new church, the foundation stone of which will shortly be laid.

WESLEYAN CHURCH, WEST BRIDGFORD, NOTTINGHAMSHIRE.—The foundation-stones were laid on the 6th inst. of a new Wesleyan church on Trent Boulevard, West Bridgford. The building will be 58 ft. long by 31 ft. wide, and is to accommodate 300 worshippers. At the rear church parlour is being erected, the measurement of which will be 34 ft. by 17 ft. 6 in., with two vestries, over which there are to be two classrooms. Every provision has been made for a heating-chamber, kitchen accommodation, and other offices. Access to these at the back of the structure will be obtained from the church by means of a specially-arranged hall at the side. The roof of the church will be partially open, and the whole of the internal finishings, including the pews, are to be of Canadian pine. At the main entrance to the church will be a porch, 21 ft. by 9 ft. The main front is faced with Cobden stone, and dressings of white Hollington stone, while a special feature will be that of a large tracery window. At the angles of the building it has been arranged to have stone ornamental buttresses, terminating with stone pinnacles. The church, it is expected, will cost 2,000. Mr. A. E. Lambert is the architect, and Mr. T. Barlow the builder.

WESLEYAN SCHOOL CHAPEL, BASFORD, STAFFORDSHIRE.—The foundation-stones of the new Wesleyan chapel, Basford, were laid recently. It is proposed to erect ultimately buildings to cost about 7,000, but at present the schools only will be proceeded with, at a cost of about 2,500. Pending the erection of the church, the schools will also serve the purpose of a chapel, the seating accommodation being for about 300. The architects, whose designs were selected in open competition, are Messrs. Ford & Slater, of Burslem, and the builder is Mr. J. H. Broadhurst, of Burslem. The school is planned in the form of a cross, and comprises an assembly-room, four classrooms, entrance porches, heating vault, &c. The assembly-room is 52 ft. by 33 ft. Externally, the building will be faced with red-facing bricks, and have moulded terra-cotta dressings.

METHODIST FREE CHURCH, NEWCASTLE.—The foundation stones of a new church for the Methodist Free Church communion were laid recently, in connexion with the Gloucester-street Circuit, at the corner of Simonside-terrace and Heaton-road, Heaton, Newcastle. The church is cruciform, with two transepts and a nave. There will be two gables, and a vestibule giving entrances in Heaton-road, into a vestibule giving access to the body of the church. The galleries will be entered from separate doors, one from Simonside-terrace and the other at the side from Heaton-road. The church is designed in the Late Gothic style. The walls of the buildings will be of sneaked rubblestonework, with dressed and rubbed mouldings. The internal fittings, including gallery fronts, rostrum, seats, &c., will be of pitch pine, and the roof will be an open timber one. The galleries will occupy each arm of the cross shape of the church, that at the back being for the accommodation of the choir and organ. At the corner of the building at Heaton-road and Simonside-terrace, will rise to a height of 65 ft. an octagonal tower and spire, with buttresses and pierced tracery. The church will provide accommodation for 700 persons. The Sunday schools are arranged with the whole of the classrooms on the ground floor, with separate entrances to the different sections, including boys' and girls' rooms and infants-room. On the first floor is the school hall. The buildings will be lighted throughout by electricity, and will be heated by hot water on the low pressure system. The architects for the buildings are Messrs. Hope & Maxwell, Newcastle, and the builder is Mr. Alexander Bruce.

WESLEYAN CHURCH, RADSTOCK, SOMERSETSHIRE.—On the 13th inst., the memorial stones were laid of a new Wesleyan church at Radstock. The site of the new church is close to the two railway stations, the main frontage facing Fortescue-road. The church itself will consist of a nave and aisles on either side. The chancel is 59 ft. 9 in. long by 37 ft. 3 in. wide, with a choir at the back raised above the nave, and in front of which will be placed the rostrum. There will be a gallery all round supported by iron columns, and approached by three staircases—two on either side of the church at the front and one from the back. There are six entrances to the church, all of which command the ground floor. Three of these entrances lead to the gallery. The chapel roof will be in one span, and will rise to a height of 50 ft. 6 in. to the ceiling, and 30 ft. to the ridge of the roof.

The building will be lighted by a four-light traceried window in the front gable over the entrance, and by ten two-light tracery windows of somewhat similar design at the sides above the gallery, and also eight two-light square-headed windows in the aisles under the gallery, all of which are to be filled in with cathedral glass. The chancel will be divided from the nave by a semi-circular moulded arch resting on stone columns, with moulded caps and bases. It will be lighted from a three-light traceried window. The school is entered from Church-street by a door at the base of a small tower and slate spirette. Its dimensions are 48 ft. long by 27 ft. wide. There is a second entrance from the side road which leads to the school, school gallery, classrooms, and the church. There will be five classrooms, four on the ground-floor and one upstairs, a ladies' classroom, 20 ft. by 14 ft., and a men's classroom upstairs, 30 ft. by 13 ft., with a platform at one end. Sittings for 536 persons will be provided, 280 of whom will occupy the body of the church and 256 the gallery. The schoolroom will accommodate 266 children apart from the end gallery, which will hold eighty-four more, making a total of 353. The floors will be of wood except in the entrance, where tiles will be laid. The walls throughout are to be of stone obtained from a local quarry. The dressings will be of Bath stone. The roofs are to be covered with Bangor slates and finished with red ridge tiles. Mr. Robert Curwen, London, is the architect, and Mr. Tom Keeling, of Tisbury, near Bath, is the builder; while Mr. S. G. Gregory, Radstock, is acting as clerk of works.

CHURCH, ORDSALL, RETFORD—It is proposed to erect a new church for the parish of Ordsall in the borough of Retford. Mr. Hodgson Fowler, architect, had been entrusted with the work of preparing plans and estimates for the new church. Instead of starting with the nave, as at first suggested, it is now determined to build the side chapel and organ chamber and a temporary nave.

METHODIST FREE CHURCH, EASTVILLE PARK, BRISTOL—Memorial stones for the new Eastville Park Methodist Free Church were laid on the 13th inst. The building is to be in the Gothic style, with turrets on each front corner. The main entrance will be by a large central door, and the size of the interior is 60 ft. by 40 ft. In the gallery running round there will be an organ loft and choir. Pennant stone is being employed in the building, with free-stone dressings, and the accommodation will include a preacher's vestry and a choir vestry. At the rear are a lecture room and two classrooms. The architect is Mr. H. M. Bennett, of Bristol, and the builder Mr. E. Clark, of Fishponds.

WESLEYAN CHURCH, SUDBURY—The foundation stones of a Wesleyan Methodist Church were laid at Sudbury recently. At present the scheme is confined to the erection of a church only, but eventually it is projected to add a church Sunday-school, a church parlour, and vestries, at a further cost of 1,500l. The architects are Messrs. Gordon & Gunton, of London. The new chapel will be situated at the junction of North-street and Melford-road, and will be built with flint walling and Bath stone dressings. The plan of the building at present contemplated consists of a church, with nave, transepts, chancel, organ-chamber, and minister's vestry. There are four entrances and exits, two of them, in the main street, being provided with porches. The builder is Mr. H. Feast, of Haddenham, Cambs.

CHURCH, GRAVELLY HILL, BIRMINGHAM—A church, which will be known as All Saints', has been erected at Gravelly Hill. The building was commenced about twelve months ago by Mr. T. Johnson, Mr. R. B. Morgan being the architect. The church as at present will accommodate 350 worshippers, and in due course it is intended to extend it to seat 500. The cost so far has been 2,200l. It is built of Leicester red bricks with white brick facings, and is roofed with Broseley tiles.

RE-OPENING OF MERTHYR PARISH CHURCH—After restoration at a cost of upwards of 8,000l., the Parish Church of St. Tydfil, Merthyr, was re-opened recently. The work of restoration has been carried out from the designs of the late Mr. J. L. Pearson, R.A., by Messrs. W. Cowling & Son, of Bristol. The church, which is built of stone, is Romanesque in style.

PRIMITIVE METHODIST CHURCH, HANDSWORTH—A new Primitive Methodist Church is now being erected at Handsworth, Yorkshire, with seating accommodation for about 300 persons. The building is to be of Yorkshire stone in the Gothic style and to be heated on the low-pressure hot-water system, the total cost being 3,075l. Mr. Fidler, of Eclington, is the contractor, and the work is being carried out under the superintendence of the architect, Mr. J. P. Earle, of Sheffield.

CHURCH, WADSLEY BRIDGE, YORKSHIRE—The foundation stone has just been laid of the new church which is being built on the Ecclesfield-road at Wadsley Bridge, to take the place of the old iron structure. The cost of the site has been about 1,000l., and the church, not including the organ, will cost a further 2,500l. The new edifice is designed to provide accommodation for 250 worshippers. The church will contain chancel, nave, small north transept, organ chamber, and vestry. The length of the chancel is 27 ft. 6 in. and the breadth 20 ft. The nave is 61 ft. long and 26 ft. wide. The entrance is by a porch on the south

side. At the south-west corner there is a turret, to contain two bells. Some progress has already been made with the building of the outer walls, in which Top Hill stone, from Oughtibridge, is being used, with Stoke Hall dressings. Bath stone is being employed for the interior generally. The east window will be of five lights, with tracery head. There will be an open timber roof of pitch pine, and the church will be seated with pitch-pine benches and a few chairs. The church will be heated with hot water, the heating chamber being in the basement. Messrs. Ellis Brothers, of Sheffield, are the architects.

METHODIST CHURCH AND SCHOOL, DOLPHIN'S BARN, DUBLIN—On the 15th inst. the corner-stones of a new Methodist church were laid at Dolphin's Barn. The church is being built from plans prepared by W. G. F. Beckett, of Dublin, by Mr. John Pemberton, by whom also the schools adjoining.

CHURCH, EASTBOURNE—The foundation stone has just been laid of a new church at Ocklynge. The architect is Mr. Granville E. S. Streetfield.

WAKEFIELD CATHEDRAL EXTENSION—The Archbishop of Canterbury laid the memorial stone on Tuesday of the cathedral extension now in progress as a memorial of the late Dr. W. Walsham How, first Bishop of the Diocese of Wakefield. The plans prepared by the late Mr. J. L. Pearson, R.A., shortly before his death, and continued by his son, Mr. Frank Pearson, of London, provide for an extension of the chancel eastward, adding to the length of the choir. There is in addition to be a retro-choir, the approach to the same, and forming a continuation of it, being a chapel, which will afford accommodation for morning and special services. The chancel aisles are to be extended to the same length as the retro-choir. This extension will take the form of north and south transepts with eastern aisles. By this arrangement, too, a chapter-house and a couple of vestries are also provided underneath. The communion table will be removed one bay eastward, and it will be separated from the chapel by a screen. Under an arch on the north side of the sanctuary it is proposed to place a canopied tomb, with a recumbent effigy of the late Bishop How. The position of the bishop's throne and choir stalls will also be altered, and various other internal improvements effected. The whole of the work was originally estimated at 20,700l., but in addition to this being exceeded by 10,000l. another 10,000l. had to be expended in enlarging the site. Messrs. Armitage & Hodgson, of Leeds, received the contract for the cathedral extension, and they have now made fairly satisfactory progress with the masonry work of the new chapter-house and vestries.

CO-OPERATIVE PREMISES, READING—The Reading Industrial Co-operative Society, Limited, have opened a branch establishment in the east end of the town on a site at the junction of London, King's, and Wokingham roads. The premises have a frontage of 50 ft. and a depth of 140 ft. The building has a lofty front elevation and a clock tower, being erected with stone from the Morley quarries, Yorkshire, by Mr. McCarthy E. Fitt, the carving being executed by Mr. Rosser. The clock tower surmounts the central entrance, and is 70 ft. in height, the distance from the pavement to the clock being 54 ft. The clock was supplied by Messrs. J. Smith & Son, of Derby. The ground floor of the premises comprises two shops, one for the sale of grocery and provisions, and the other for drapery and boots, &c. The shops are separated by a corridor entrance to the rear of the building. At the back is a yard with the stores and offices. On the floor above the shops is a room, 53 ft. by 52 ft., which will be used as a furniture showroom, and above and in the rear are also storerooms. Mr. W. G. A. Hambling, of Reading, was the architect, and Mr. T. R. Whiting, of Reading, the contractor. The shop fittings were carried out by Messrs. George Lewis Bros., of Reading, and the window fittings by Messrs. Potter, of London.

OFFICES FOR PERTH PARISH COUNCIL—Recently the Parish Council of Perth purchased property in York-place, one of the main thoroughfares in the city, for the purpose of having it altered so as to render it suitable for offices required for Parish Council business. The premises in York-place have a frontage of 55 ft., and have entrances both from the main street and from Kinross Causeway. On the ground floor are the Inspector's room and the Collector's room, with clerks' offices, together with Medical Officer's room, waiting-room, storeroom, small storeroom, and lavatory accommodation. Underneath there is a storage cellar. On the upper floor are the Council-room, which measures 30 ft. by 25 ft. and the caretaker's house. The contractors are:—Mason work, Mr. William Tait, Errol; joiners, Messrs. Peter Johnstone & Son, Perth; plumber, Mr. Peter Duffie, Perth; slater, Messrs. James Duchan & Son, Perth; plasterer, Mr. John Sharp, Perth; and glazier, Mr. Charles Alexander, Perth. The plans were prepared by Mr. James Marshall, architect, Perth.

SWIMMING BATH, BROAD-STREET, HOLBORN—The foundation-stone of a swimming bath in Broad-street, Holborn, was laid on Wednesday by the Duke of Bedford, Mayor of Holborn. The new swimming bath is an extension of the public baths and wash-houses erected in Endell-street by the Commissioners for Public Baths and Wash-houses

for the Parishes of St. Giles-in-the-Fields and St. George, Bloomsbury, in the year 1852. The design of Messrs. John & S. Flint Clarkson, of Great Ormond-street, having been accepted from several others submitted, a contract with Messrs. F. Gough & Co., of Hendon, for the erection of the baths was entered into. It is anticipated that the total cost of the land and baths will amount to the sum of 25,000l. The extension, which will have a frontage in Broad-street of 55 ft., and a depth from north to south of 150 ft., will provide a swimming bath 90 ft. in length, with closed dressing-boxes entered from the platforms. The bath will be paved with mosaic, the walls faced with glazed bricks, and domed ceilings of fibrous plaster will be formed above the lantern lights; a gallery will run round all four sides of the bath-hall. There will also be subways all round. The bath-hall will be entered through a vestibule, &c. from Broad-street. The height of the bath-hall will be about 20 ft. from the bottom of the bath to the domes. The elevation towards Broad-street will be four stories in height, of Portland stone, red Bracknell bricks being used for the upper floors. The elevation will resemble the existing front in Endell-street, the resemblance being intentionally made so strong that it will be clear that the two frontages are parts of one building. There will also be provided rooms for clubs and a general supplementing of the existing accommodation. All the floors will be constructed of fire-resisting material. The water in the swimming-bath will be heated by steam. Arrangements will also be made for the steam-heating of the atmosphere, so as to counteract condensation and to enable the bath to be kept in use in chilly weather. The building will be lighted by electricity.

THEATRE ROYAL, YORK—A scheme for improving the Theatre Royal, York, based upon a report by Mr. Frank A. Tugwell, architect, has just been agreed to. The cost is estimated at 5,200l. **OPERATION THEATRE, CARDIFF INFIRMARY**—Mr. Edmund Owen, senior surgeon at St. Mary's Hospital, London, formally opened the new operation theatre of the Cardiff Infirmary recently. The new room has two entrances, one for students and the other being the accident entrance, with anaesthetising room and lobby adjoining the chamber used by the surgical staff. The whole of the northern portion of the roof of the building is of glass. The ventilation is controlled by a motor fan in the upper portion of the roof, operated by electricity, fresh air being admitted and warmed by a special arrangement of swing radiators, provided by Messrs. John Williams & Son, Cardiff. The rooms are lighted by electricity. The work has been carried out by the architect of the infirmary, Mr. E. Seward. The contract has been carried out by Messrs. Lattey & Co., of Cardiff, the terrazzo pavements being by Messrs. B. Ward & Co., and the special sinks and fittings by Messrs. Cross Bros. The electrical fitting of the ventilating fan was entrusted to Messrs. Chy Bros., the fan being provided by Mr. Wilkinson, of Cardiff, whilst the electric lighting has been carried out by Mr. Nance, of London.

COTTAGE HOMES, PONTELAND, NEWCASTLE-ON-TYNE—Cottage homes are being erected at Ponteland by the Newcastle Board of Guardians for the accommodation of destitute children. About seventy acres of ground have been secured. Entering from the Kirkcaldy-road by a new thoroughfare that is being constructed across the fields, the first building will be the superintendent's house, which will also contain the stores and offices. Four double blocks of cottages will be constructed and one half-block, the latter being intended at first as an isolation hospital in the event of any outbreak of disease amongst the children; but in the event of more accommodation being required later on it can be converted into a home and another building erected as a hospital. It is also part of the scheme to erect a workshop for the teaching of trades, such as plumber, joiner, shoemaker, &c., the instruction being given by qualified tradesmen who will be appointed under the title of foster fathers to each block. The intention is to appoint respectable married tradesmen to these positions. Then there are stables and out-offices to be used in connection with the working of the land, part of which will be laid out as kitchen gardens, part as a plantation, and part as arable land. A plentiful supply of spring water has been obtained by boring. The buildings will be of red brick with slated roofs. The larger block of cottages will accommodate forty children, and the three smaller blocks thirty each. The architects are Messrs. Oliver, Leeson, & Wood, and the builder is Mr. Henderson, of Ponteland. Mr. Humphrey Atkinson has been appointed clerk of the works.

EXTENSION OF THE EDINBURGH CITY CHAMBERS—On the 7th inst. the foundation-stone was laid of the north-west portion of the north front of the City Chambers, Edinburgh. It is several years ago since the plans by Mr. Morham, City Architect, for the extension of the City Chambers were sanctioned. About 200,000l. are to be spent on the extension and improvement of the buildings. The work has gone on in sections. The portion now arranged for will be continued along Warriston Close, and will have a frontage to Lockhart-street and the north. On that side it takes the place of the

tioned, is held at University College, and the exhibition is under the auspices of the Board of Architecture and Applied Art. There are architectural designs, modelling, decorative designs, examples of stained glass, copper work, some examples of enamels, which branch was only started this year, and also some examples of wood carving, wrought iron, and other crafts. Councillor John Lea, Chairman of the Board, presided, and there were also present Professor Simpson (University College), director of the school, and Messrs. Allen, John, J. McNair, Rathbone, instructors. The Chairman having expressed pleasure at seeing the Lord Mayor present, Professor Simpson said there were seventy-three students attending the day classes at the school and 171 the evening classes, a total of 244 during the past session. This was fairly satisfactory, considering the limited accommodation at their disposal for students. The principal aim of the school was the special attention given to arts and crafts allied to architecture, and it was of the utmost importance nowadays that students, apprentices, and others should have an opportunity of obtaining an insight into the secrets of their crafts and their methods of working them, which in the old days of apprenticeship system were learned only in the workshop. A point he wished to emphasise was the great advantage of such a school to architects, manufacturers, and others, and he felt that persons in these walks of life who had the power of placing work should take advantage of the skill and ability of students who had been trained in such a school as this. On the Continent manufacturers and others were closely in touch with the higher technical schools, and it was due to this fact that great strides commercially had been made in Continental countries.—The Lord Mayor said that his connexion with that school was very small. For three years he served on the Technical Instruction Committee, and amongst the money grants which that Committee gave to various portions of the University was one of 1,000l. annually towards this special department of the University, viz., architecture and applied art. He also found that an additional grant of 400l. had been given this year consequent on the very great work the school was doing. The number of students in the school was very satisfactory, and the attendance good. The classes included no fewer than twenty different crafts, which showed that they were really trying to embrace all the objects which would be beneficial to the trade of the city.

CAPITAL AND LABOUR.

THE BRADFORD BUILDING TRADE DISPUTE.—So far, says the *Bradford Observer*, there is no sign of either the Master Builders' Association or the various operative societies giving way on the points at issue, and to this extent the situation remains practically unchanged. If anything, both sides appear to be even more uncompromising in their attitude than when the trouble first arose. The employers still express their willingness to refer the whole subject to arbitration, but there appears to be no prospect as yet of their offer being accepted. When this proposal was originally introduced the refusal to entertain it was practically unanimous. On May 1, when the notices came into operation, the approximate number of men thrown out of employment was 1,300, comprising 700 masons, 300 joiners and carpenters, 150 labourers, 50 bricklayers, and 100 non-union men. During the course of the dispute, however, this total has almost been diminished to half the number, especially in the case of the societies which have the advantage of a complete organisation throughout the country. Speaking generally, the building trades are reported to be in a tolerably flourishing condition, and through the agency of branches of the operative societies in other centres, the workmen affected by the dispute are gradually being drafted out of the town. In only a comparatively few instances have they returned to Bradford. Accordingly, the Society of Operative Masons had yesterday about 350 names on their books instead of the 700 of six weeks ago. The union officials state that in all these cases the men have no difficulty in obtaining the conditions which they are advocating in Bradford. The Amalgamated Society of Carpenters and Joiners report a similar exodus, though in this case the proportion of departures does not appear to be quite so large as amongst the masons. However, instead of 300 or 350 members, the roll-call does not now show more than about 250. Not only are the men taking up employment elsewhere as opportunity occurs, but what is still more satisfactory from the point of view, a very large number of applications for "clearance" are being dealt with, so that evidently the operatives are settling down to their new employment, with no immediate idea of returning to Bradford. The members of the Amalgamated Society of Carpenters and Joiners regard the situation with some degree of equanimity. According to the returns for the current month, the society have a total membership of over 67,000, and a general fund of 250,000l., whilst last year, without any special levy, they expended about 35,000l. in a similar conflict against the employers at Belfast. In the case of the branches of the building trade which are not so highly organised, the percentage of

transfers to other towns is naturally not so great, but in the aggregate the total, week by week, steadily becomes less. A few of the operatives have resumed work in Bradford, but all the public works of the city remain at a standstill, these including the Cartwright Memorial Hall, the Corporation Markets extension, the new Conditioning-house, and the new Central Fire Station.

THE BRICKLAYERS' STRIKE, NORWICH.—Taking the carpenters' settlement as a precedent, the masters have recently offered the bricklayers, whose strike is now in its second year, an advance of a halfpenny an hour, to begin on January 1 the settlement to be operative for four years, dating from June 1 last. This offer, however, was accompanied by various conditions designed mainly to prevent those vexatious disputes which have formerly arisen among different classes of workmen, notably bricklayers and plasterers, as to the line of demarcation between their respective duties. The men would prefer that the halfpenny per hour should begin with the resumption of work; and that the conditions, some of which they are strongly averse to, should be settled by conference afterwards. However, they have held a meeting on the subject at their headquarters, the Pigeons, Charing Cross, and we are informed unofficially that they practically agreed to accept the masters' terms. The result has not yet been communicated to the masters, but we believe the strike may be regarded as ended.—*Eastern Daily Press.*

LABOURERS' STRIKE, CLEVEDON, SOMERSETSHIRE.—The masons' labourers have struck for an advance of wages from 44d. to 5d. per hour. The masters have offered 44d., making a weekly wage, full time, of 11. 1s. 6d.—which, they assert, is as much as can at present be paid for unskilled labour. The labourers urge that the pay in Bristol is 5d. per hour, and that certain contractors in Clevedon, who come from a distance, pay that sum. About forty labourers are involved.

LEGAL.

DISPUTE BETWEEN ARCHITECTS.

THE case of Portsmouth v. Seward came before the Court of Appeal, composed of Lords Justices Rigby and Collins on the 14th inst., on the appeal of the defendant from an order of Mr. Justice Kekewich in the Chancery Division, dated May 14, 1901.

Mr. Warrington, K.C., in opening the case, said this was an appeal by the defendant from an interlocutory order of Mr. Justice Kekewich granting an injunction until judgment or further order restraining the defendant from carrying on business as an architect at Swansea. The order was founded on an agreement entered into by the defendant, and made on January 9, 1899, by the defendant and his then partner upon the sale by them to the plaintiff of a business which they were then carrying on at Swansea, and the question their lordships had to determine was a question on the construction of the agreement, the facts being admitted. The facts were these:—Prior to January 9, 1889, the defendant, Mr. Edwin Seward, and Mr. George Thomas were practising as architects and surveyors at Swansea and at Cardiff, and the plaintiff Henry Charles Portsmouth was employed by them in their Swansea business. In that state of things Messrs. Seward & Thomas agreed to make over to the plaintiff their Swansea business, they continuing their Cardiff business, and the agreement of January 9, 1889 was entered into for that purpose. By the agreement Messrs. Seward & Thomas bound themselves to discontinue practising in Swansea, and not to open or encourage any one to open an office for the carrying on of their practice as architects and surveyors in Swansea so long as Portsmouth should remain in practice there, except only that they reserved the right to act in all cases in which they might be called upon or specially invited to act in either branch of their profession. There was no stipulation that they were not to ask for business in Swansea, but they were not to open any office there, immediately after that agreement Messrs. Seward & Thomas gave up their business in Swansea, and they had never had an office there since, and they had never since practised in Swansea. But in August of last year the Swansea Harbour Trust, which was an important public body in the town, issued an advertisement which went broadcast over the whole of the country, asking for architects to send in designs for new offices which they were proposing to erect. Mr. Seward, who was then carrying on business alone, saw the advertisement in one of the building trade papers. The effect of the advertisement was that two premiums were offered, the first 100l. and the second 50l., and that the architect's commission would be 5 per cent. on the outlay, to include all sketches, estimates, and specifications, and to involve personal superintendence of the work as architect. It was also provided that should the premium be made over to the architect, Mr. Seward sent in designs in accordance with the conditions and the plaintiff also sent in designs, there being ninety-seven altogether sent in. The committee to whom they were referred selected six designs, amongst them being the defendant's,

but the plaintiff's design was not accepted. Ultimately, the committee accepted the defendant's design. Having accepted his design on February 6 last, the clerk wrote requesting him to send in his detailed drawings, specifications and quantities. There for the moment the matter ended. The defendant would probably be employed to do the work, and unless he was restrained from doing it, he intended to do it if he was employed. The question to be determined was whether that agreement prevented Mr. Seward from undertaking this business. Mr. Justice Kekewich had granted an injunction which would prevent him from undertaking the work, and it was from that order that he appealed.

Lord Justice Collins: Is there any evidence as to how long the work will take?

Mr. Warrington: No, there is no evidence as to that.

Lord Justice Collins: It does not involve his taking an office to do it?

Mr. Warrington: No, he does not intend to open an office. He would merely be the superintending architect. It clearly does not hurt the plaintiff because he competed and was not accepted, and, therefore, the defendant is not preventing the plaintiff from getting work he otherwise would have got. I ask your lordship to say that the agreement does not apply to this case. I request that all the agreement is to restrain the defendant from holding himself out as a local practitioner, and that is what the defendant has not done.

Mr. Renshaw, K.C. (with him Mr. Christopher James), submitted that the decision of the learned judge in the Court below was right. One of the conditions was that the architect was to personally superintend the work, and by so doing Mr. Seward would be practising as an architect in Swansea in breach of the agreement. It could not be said that he was ever called upon or specially invited to act in the matter, and therefore this did not come within the exception.

Their lordships, without calling upon counsel for a reply, said the agreement expressly provided that if any one wished the defendant to act for him in Swansea he was not to be restrained from acting. There was nothing to prevent the defendant from sending in designs in the competition, and if he was successful there was nothing to prevent him from undertaking the work if he was requested to do so. The appeal was accordingly allowed, and the order of the Court below discharged.

ACTION BY A VENDOR AGAINST PURCHASER FOR SPECIFIC PERFORMANCE OF CONTRACT.

MR. JUSTICE FARWELL, in the Chancery Division on the 13th inst., delivered a considered judgment in the case of Greenhalgh v. Brindley, which raised the somewhat important question as to the duty of a vendor to disclose to a purchaser a contract with reference to the access of light and air to the premises sold.

The material facts were these:—The action was by a vendor for specific performance of a contract in writing, dated October 4, 1900, for the purchase by the defendant of twelve houses in Florence-street, Stockport. The contract was an open one, and in the course of the negotiations which led up to it, the plaintiff wrote to the defendant on August 27 stating that the houses were four years old, and in September the defendant visited and saw the houses for herself. The property abuts on Florence-street, and contains windows looking over the street on to public recreation grounds which were vested in the Corporation of Stockport under a conveyance dated in 1873, and subject to covenants which prevent the erection of buildings thereon and their use for any other purpose than recreation grounds without the consent of the grantors. Nothing was said either in the negotiations or in the contract with reference to the access of light to the windows. After the contract the defendant ascertained that the plaintiff had entered into a deed of covenant with the Corporation dated February 10, 1900, and on this ground declined to perform the contract. The deed of covenant was made between the Corporation of Stockport of the first part, a Mr. Wainwright, the mortgagee of the houses, of the second part, and the plaintiff (the owner) of the third part, under which the plaintiff as owner covenanted with the Corporation to pay them the yearly sum of 1s. on March 25th in each year, the plaintiff and his mortgagee declaring that each of such payments was a fresh acknowledgment that the plaintiff was not as owner entitled as of right to the uninterrupted flow of light or air to any windows or lights in the southerly walls of the said houses over or from the recreation ground. It was also declared that in case of the non-payment of the said sum of 1s. in any year, the fact of such non-payment should not be taken as an abandonment of the rights of the Corporation to obstruct on their own land the admission of the light and air to the said lights or windows of the houses in question. No purchaser would be bound by the covenant to pay contained in this deed but as against a purchaser with notice, the deed would have the effect of a consent in writing within Section 3 of the Prescription Act granted by the Corporation and accepted by the purchaser and continuing until determined

by notice of repudiation. The defendant, as purchaser, contended that she was prejudiced by the deed by losing four years of the statutory period, and by being compelled to give notice of repudiation with the consequent probability of exciting the Corporation to block the lights at once.

Mr. Justice Farwell held that a contract for the sale of a house with windows looking over the land of a third person implies no representation of warranty that the windows were entitled to the access of light over such land. If such access had in fact been enjoyed for the statutory period, then the property had the easement of light; but an access for ten years created nothing at all. He found, therefore, that there was no ground on which he could refuse to grant specific performance or on which he could give the defendant compensation. He, however, made no order as to costs, because he thought that the plaintiff ought to have informed the defendant before the contract of his covenant with the Corporation, and left her to judge for herself whether it was or was not advantageous to the property.

Judgment was accordingly entered for the plaintiff without costs.

Mr. W. H. Upjohn, K.C., and Mr. T. T. Methold appeared for the plaintiff, and Mr. C. E. Jenkins, K.C., and the Hon. Frank Russell for the defendant.

THE VIBRATION CASE AT LEYTON.

THE case of *Hawkes v. the Leyton Urban District Council* was in the list to be mentioned to Mr. Justice Buckley in the Chancery Division on Monday, the 17th inst.

Mr. H. Terrell, K.C., on behalf of the defendants, said that the matter was before his Lordship on the last occasion on May 14, on an application by the defendants to suspend the operation of a writ of sequestration granted by his Lordship and confirmed by the Court of Appeal, for breach of an injunction to restrain a nuisance caused to the plaintiff in the use by the defendants of gas plant in connexion with their electric lighting works. His Lordship then made an order staying the operation of the writ over that day. The learned counsel read affidavits to the court which showed what the defendants were doing to substitute steam plant for gas plant, and by the consent of the other side his Lordship further stayed the operation of the sequestration for eighteen months, with liberty to either party to apply in the meantime. It was stated that the gas plant had been disconnected and the defendants were ordered to pay the costs of the present and the last application, which were directed to be included in the same taxation as the costs of the order for sequestration.

WORKMEN'S COMPENSATION ACT:

WHAT IS AN "ACCIDENT"?

A JUDGMENT of considerable importance was delivered on Monday by Judge Stonor at Marylebone County Court. The applicant in the case was Richard Perry, a carpenter and joiner, 14, Napier-road, College Park, N.W., and he had brought an action under the Workmen's Compensation Act against Mr. Leach & Sons, Hylle-road, Works, and High-road, Willesden Green, N.W., the claim being in respect of personal injuries said to have been sustained by the applicant while in the respondents' service.

The facts of the case are clearly stated in the judgment, which was to the following effect:—

The applicant in this case is a carpenter and joiner, and was on September 18 last in the employment of the respondents. At the trial the applicant deposed that on September 18 last he was working at the respondents' works making a large oak seat or bench. He had got the seat together, and while lifting it up, to see if a joint was right underneath, he suddenly felt a pain in his side. He could not straighten himself nor continue his work, but had to go home. In consequence of the accident he was in bed for three weeks or a month, and he was still suffering from the result of the accident. The applicant's appearance at the hearing—continued his Honour—corresponded with his evidence. There was no evidence of any actual disease in the applicant. It was contended on the part of the respondents that the accident, or at all events the effects of it, were partly caused by the applicant's stoutness and unyieldiness—in other words, his general condition of body—and that the applicant was therefore barred from recovering in the action. The case of *Lloyd v. Sugg & Co.*, 1900, 1 Q.B., 481, *Senhouse's Cases II.*, p. 5, however, shows clearly that such is not the case, supposing that the accident had been caused partly by the applicant's condition of body or even by actual disease. There could, therefore, be no reasonable doubt that the applicant was entitled to compensation under the Act if the "accident" came within the Act, and it was, in fact, regularly paid to him until January 5—more than three months—by the respondents with the concurrence of the insurance company in which the latter were insured. The only question, therefore, to be decided in this action is whether the injuries which the applicant received arose from an "accident" within the meaning of the Act. Now, according to the natural meaning of the word "accident,"

its definition in every dictionary, and its use in common parlance, and in the absence—as far as I can see—of any provision in the Workmen's Compensation Act, indicating its significance, or requiring it to be narrowed, I should have no hesitation in finding that the fact of being disabled from work by simply lifting a seat through straining or injuring the muscles of the back without any unusual or unreasonable exertion was an "accident" within the meaning of the Act; and the breaking or injuring a muscle or other portion of the human frame in the due execution of the employer's work appears to me to be the same as the breaking or injuring any tool or instrument under the like circumstances; and, therefore, that the employer would be equally liable under the Act in both cases for any consequent evil results to the workmen employed. If, therefore, the point were untouched by judicial decisions, I should certainly find for the applicant. There are, however, several recent decisions of the Court of Appeal which point to a different conclusion, and show that the learned Judges of that Court are of opinion that a narrower construction ought to prevail, but the exact ground of that opinion, I regret to say, I have failed to discover. I refer particularly to the cases of *Hensley v. White*, 1900, 1 Q.B., 481, *Senhouse's Workmen's Compensation Cases II.*, p. 1; *Walker v. The Lillieshall Coal Company*, 1900, 2 Q.B., 401, *Senhouse's Workmen's Compensation Cases 21*; and *Timmins v. Leeds Forge Company*, 16 T.L.R., 517, *Senhouse's Workmen's Compensation Cases II.*, p. 10. In the first two cases the Court decided in favour of the respondents, and in the last case in favour of the applicant, but on the ground that some planks had been unexpectedly frozen to each other, and consequently required unforeseen and unusual exertions from the applicant in lifting them. Independently of special circumstances like those I have just mentioned, the Court of Appeal in these and other cases has held, as I understand, that to come within the meaning of the Act an "accident" must be from some external cause, resulting directly in injury; e.g., a blow through a miss hit (*Lloyd v. Sugg*), or a sudden frost (*Timmins v. The Leeds Forge Company*), and not from internal causes directly, as in the cases of reasonable personal exertions in working engines (*Hensley v. White*) or the handling of usual materials and appliances (*Walker v. The Lillieshall Coal Company*). In the present case the accident—for accident it was, whether within the meaning of the Act or not—was the internal injury to the applicant in the muscles of his back, through the movements of his body in the usual and reasonable exertion of lifting a bench under perfectly ordinary circumstances, and I can see no material distinction between it and the cases of *Hensley v. White* and *Walker v. The Lillieshall Coal Company*, and I feel bound by the decisions of the Court of Appeal in those, and also in other cases, to find for the respondents.

DISPUTE ON A CONTRACT.

THE case of the *Brush Electrical Engineering Company v. the Governor of Malta* came before a specially constituted Court of King's Bench, composed of Justices Bruce, Kennedy, and Phillimore, on judgment on the 17th inst. The case was argued before Justices Kennedy and Phillimore a few weeks ago, but as their Lordships differed, an additional Judge (Mr. Justice Bruce) was called in and the matter re-argued.

The case came before the Court in the form of a special case, from which it appeared that differences having arisen between the *Brush Electrical Engineering Company, Limited*, and the Governor of Malta in respect of claims made against the latter under a contract of March 22, 1895, the matter was referred, under the arbitration clause in the contract, to Mr. E. Manville. It appeared that the claimants undertook to execute certain works for the supply of electricity in Malta, and Sir W. H. Preece, K.C.B., acted as consulting engineer from time to time, when certificates were given for the work and payments made for work done. On November 20, 1897, the consulting engineer gave the claimants two final certificates, the first certifying the sum due to the claimants, being the final balance less one-fifth of the total amount for the contract price deducted therefrom; and the second certifying that the whole of the works had been completed and had worked satisfactorily for six months from completion, and that the other obligations of the claimants had been performed, and that the above-mentioned one-fifth of the total amount of the contract price was then due to the claimants. In ascertaining the amounts so certified, the consulting engineer deducted from the total price of the work as determined by him the sum of 450*l.* as damages for delays under the contract. The respondent, the Governor of Malta, had offered to pay the total amount certified by the engineer, less a sum of 1,000*l.* (in addition to the 450*l.* already deducted), which he claimed to be entitled to set off as liquidated damages for delay. On June 1, 1900, the parties appeared before the arbitrator, when the claimants pressed to give evidence in support of their claim for the total amount of the invoices sent by them to the engineer, less certain deductions which they had

allowed. In particular they proposed to give evidence to show that the engineer had not correctly estimated the value of additions and deductions in accordance with paragraph 55 of the contract. The respondent contended that such evidence was not admissible. On his part the respondent proposed to give evidence to show that he was entitled to deduct the further sum of 1,000*l.* as liquidated damages for delay as provided under the contract. The claimants contended that such evidence was not admissible. The questions of law for the opinion of the Court were (1) whether the engineer's certificate was a condition precedent to the claimants' right to recover under the contract; (2) whether the engineer's certificate was binding and conclusive between the parties with regard to the points raised in the statement; (3) whether the engineer's certificate was binding and conclusive between the parties with regard to the amount due to the claimants apart from the question of damages for delay; (4) whether the engineer's certificate was binding and conclusive between the parties with regard to the amount due to the respondent in respect of damages for delay.

Mr. Justice Bruce and Mr. Justice Kennedy in giving judgment, having stated the facts, said it was unnecessary to answer question (1) of the special case because their subsequent answers showed their opinion. Their answer to the second question was "No." The answer to the third "Yes," and the answer to the fourth "No."

Mr. Justice Phillimore dissented with the majority of the Court on its finding as to the third question. No order was made as to costs.

ACTION BY BRIGHTON BUILDERS AGAINST BUILDING-OWNER.

A DIVISIONAL COURT of King's Bench, composed of Justices Bruce and Phillimore, on the 12th inst. disposed of the case of *Sattin* and another *v. Poole* on the appeal of the plaintiffs, a firm of builders carrying on business in Brighton, from a decision of Mr. Verey, the Official Referee, in an action brought by the plaintiffs against the defendant, Mr. Geo. Thomas Poole, also of Brighton, on a contract under which the plaintiffs carried out certain building work on the St. James's Restaurant, in St. James's-street, Brighton, of which the defendant was the owner.

It appeared that by the terms of the contract in question the plaintiffs undertook to reconstruct the building within a specified time limit, the penalty of exceeding which was 12*l.* a week should the architect (Mr. Clayton Botham, of Brighton) not give the usual certificate for extension of time. The defendant paid for everything in connexion with the work except a balance of 681*l.* due to the plaintiffs, but in regard to this he claimed 231*l.* by way of penalties, and paid 450*l.* into court as being sufficient to meet the plaintiffs' claim. The case went before the Official Referee upon the point as to whether the penalties could be deducted under Clause 24 of the contract. The Official Referee held that the contractor had failed to complete within the time that the architect certified that the work could have been reasonably completed, and that the defendant under Clause 24 of the contract was entitled to deduct from the sum due from him to the plaintiffs a sum exceeding 231*l.*, the balance of the claim, after payment into court of 450*l.* He accordingly entered judgment for the defendant. From this decision the plaintiffs appealed on the grounds that the Official Referee had refused to hear the evidence offered on the part of the plaintiffs to show that the delay was caused by the owner, or by his architect, in ordering extras, in supplying material after the specified date, in delay in the selection of stone to be used, and in the alteration of plans.

In the result their lordships upheld the decision of the Official Referee and dismissed the appeal. Judgment accordingly.

Mr. Frank Dodd appeared as counsel for the plaintiffs (appellants), and Mr. Herbert Reid, K.C., and Mr. Kissin for the defendant (respondent).

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

3,009.—PENDANT, BRACKET, AND SIMILAR LAMPS. *H. Faldmisch*.—In order that the hanging pipes and fittings may be partially hidden with the globes or shades by way of giving the dropping effect of electrical lamps, and that the metal fittings may be placed out of the course of the products of combustion, it is arranged that the globe or shade shall be joined to the holder, or clips, by means of an engagement between a flange upon its upper end and screw bolts or screws, whilst the burner is joined to the arm, or arms, of the gasifier or pendant with rods or tubes. For a globe which has an open lower end a thumb-piece is provided for the turning of the gas-cock, but for a globe that is closed beneath, the gas-cock should be mounted upon one of the bracket or pendant arms, side openings being made near the base of the globe for supplying air and facilitating access to the burner.

3,023.—LIFTING APPARATUS FOR CRANES: *J. Fielding*.—One end of the hoisting chain is passed around a pulley and another pulley upon the shaft, for attachment to the jib; the other end is passed around a pulley and another pulley upon the shaft, and so to the end of the jib, and the crane hook; the jib is thereby partly sustained by the load and stays at a constant level when the load is lifted; to the jib is attached a rope that is passed around a double fusee and has at its one end a weight for balancing the jib, a part of the rope is upon the smaller diameter and the other part is upon the larger diameter of the fusee when the jib is at its highest position; but they will have changed their relative places at the extension of the jib, with which the balancing moment of the weight is thereby increased.

3,064.—JOINTS OF CORRUGATED SHEETS: *F. Smith*.—The inventor devises angular corrugated strips for joining, angle-wise, corrugated sheets for roofs and similar structures; he forms ridges upon one side of the strip which will meet grooves at its other side, and in some cases inclines the corrugations to the edges of the sheets and strips.

3,094.—LIME AND OTHER KILNS: *W. Spencer*.—In the case of shaft-kilns, air or other combustion-supporting gas is admitted at points near the openings through which the fuel is charged. Vertical passages are made in the wall of the lower chamber and communicate between an annular channel and converging ducts which lead into the narrower part of the kiln over the opening for the charge of the fuel, whilst additional air-passages may be made at or near the narrowed part of the kiln. If the lower chamber is built into, or surrounded with earth, the annular channel is formed so as to lead into the draw-hole.

3,123.—A CONTRIVANCE FOR WINDOWS: *S. C. Taylor*.—For sliding-sashes that can be liberated from their guides, the tongues of strips joined to the lower sash will engage with grooves which guide the lower sash, diagonal slots cut in the strips engage with pins upon the sash so that one can move the tongues into or out of the grooves by moving the strips and bolts provided with handles and screwed through nuts will lock the strips, and spring-controlled hinged guide-strips can also be employed.

3,144.—ELECTRICAL TELEPHONES: *E. W. Brown*.—The apparatus will serve for a transmitter and a receiver either combined or separate, a laminated core is wound with primary and secondary wires of which the latter is connected through the core and diaphragms with a battery, or the former may be connected to line instead, a microphone is made of lamp-black or granulated carbon, or the diaphragms may be treated chemically; the apparatus, provided in a case; a tube, having at one end a contact for cutting in the battery when the telephone is being used, and leading to a mouthpiece, is pivoted in the case.

3,227.—A METHOD OF VENTILATION: *G. B. Dye*.—For producing moistened air strips of fabric are wetted in a range of superimposed ring-troughs wherein float-valves keep the water at a certain level, air flows through a casing of gauze and the strips into a middle shaft whence a fan or pump draws it for distribution by cones and trays which will serve for purposes of ventilation independently from the humidifier; in another shape a wetting-apparatus is disposed between the fan and the distributing trays and cones.

3,262.—TREATMENT OF WOOD: *American Wood Fireproofing Co.*—The object of the invention is to prevent deliquescence of the salts with which the prepared wood is impregnated. A fire-proofing solution containing borates, sulphates, and phosphates of the alkalis is recommended, with which is mixed casein rendered insoluble with the action of formaldehyde or carbonic-acid gas; or some water-repelling substance, such as an oil emulsion, or else a soluble soap may be used—fatty acids being precipitated with carbonic-acid gas, &c.

3,305.—A CIRCULAR-SAW GUARD: *D. Rigby*.—An adjustable guard that will serve for saws, and timber, of different sizes consists of a radial arm that can be raised or lowered, and has at its end a slotted plate on to which the riving-knife is adjustably bolted. A slotted plate (which can be set back accordingly with the size of the timber) and a lower end-piece having a roller hinged to the slotted plate constitute a front guard, which is to be folded backwards when the entire depth of the saw is needed for use.

3,331.—A CONTRIVANCE FOR USE WITH WATER PIPES: *A. Niesch-Saxer and R. Niesch*.—To obviate freezing of water in pipes they are emptied by means of a double valve which is mounted upon a hollow spindle that is joined to the service pipe with a connecting-box, as water from the main supply flows through the upper part of the valve and an aperture between the valve-faces it reaches the spindle, which can be lifted with a handle so as to close that portion of the valve whereupon the water flows away from the service pipe through the lower part of the valve.

3,340.—PAINTERS' AND SIMILAR BRUSHES: *Verlignig Pinsel-fabrik*.—The lower ends of the bristles are clamped with a cap or ferrule made of sheet-metal which is then secured within the fixed

socket of the handle with a wire that squeezes the sides of the socket into a groove fashioned in the cap.

3,371.—A SWITCH FOR ELECTRICAL HEATING: *E. F. Porter*.—A compound switch is devised for regulating air-heating mechanism which embodies a fan driven by electricity and electrically-heated wires (as specified in No. 2,505 of 1901) wherein the heated wires are carried by the fan. The current is caused to flow to an insulated pivot on which are mounted two hand-switches, whereof one, being jointed, and having a spring, can be moved with its handle towards the right so as to effect a quick break between its inner portion and a contact-stud connected with the heating wires; when that switch is moved to the contact for conducting current to the heating-wires, it impels the other switch to the first of a set of studs that will make contact with the other switch and so starts the motor of the fan. The latter switch can be moved to form contact with the set of studs that are connected through resistances to the motor of the fan, the former switch being left unmoved. When the latter switch has been moved towards the right hand for a disconnection of the motor it at the same time moves a lever that projects from the first-named contact-stud, and a spring which forces the two switches asunder thereupon establishes a quick break.

3,378.—A VENTILATING-DEVICE FOR WASTE WATER PIPES: *C. Fitter*.—In order that the water may not be drawn out from the intercepting trap, an air inlet valve which will open automatically is provided for a tapped ventilating-device; the valve casing is mounted upon the free leg of an angular pipe which is inserted into the waste pipe at the rear of the water seal and is fitted with a bell valve dipped into glycerine or a non-volatile liquid contained in a groove of the casing open underneath for the maintenance of a vapour-tight seal, the entrance of water is obstructed with a plate, and gas-tight joints are made.

3,413.—COMBINED STOVES AND FIREPLACES: *H. Steven and J. Colquhoun*.—For a close stove and an open range combined a part of the fire-cover is hinged at the back and will fall down the inclined flanges of another plate when the cover is pushed backwards, so as to afford a free passage for the flue, but when it is drawn forwards the hinged part will, by reason of the incline, assume a horizontal position, and the entrance to the flue will be covered by the vertical flange of the plate or cover; other inclines cause the entire fire-cover to rise as it is being forced backwards and to fall when it is pulled forwards, rebated diagonal guide-slides upon the underside of the hot-plates at either side of the fire keep it in its place; the invention, which may be applied also to portable ranges, provides for a closing of the lower portion of the stove with a plate that runs in slotted brackets so as to form a rest shelf, or toasting-rack, and for directing the ashes into the ashpit by means of the inclination of the hinged upper part of the door that controls the air supply.

3,423.—A DISCHARGE-VALVE AND OTHER FITTINGS FOR WATER-CLOSETS: *W. F. Probert*.—In order to ensure the discharge and flushing of the basin at the same time the inventor joins a collapsible chamber (at the bottom of the basin) which carries a valve to a diaphragm or piston pump by means of one pipe, and with another pipe joins the piston pump to the flushing pipe. Under normal conditions a spring keeps the diaphragm depressed, but as the latter rises it exhausts the air from within the chamber so as to impel either water or air into the flushing pipe and to start the siphon, with the gradual return of the valve upon its seating is effected by means of an auxiliary time-valve placed beneath the piston pump.

3,436.—A METHOD OF PAINTING UPON SURFACES: *H. Ruseck*.—The invention relates to the painting of designs in vertical lines upon walls and other extended surfaces; a stand is fitted with horizontal shafts, having sleeves in which slide rods arranged in pairs and carrying yokes for pattern-rollers, the rods being joined together with links and sockets; the colour is supplied to the rollers from brushes on the yokes, and the rollers are fitted with raised porous surfaces made of cloth or felt, or of felt laid upon embossed rollers.

3,472.—APPARATUS FOR HEATING BATHS: *T. Law*.—A hot-air or vapour-heating contrivance for cabinet baths comprises a gas or spirit lamp or stove of which the cover is closed at its top, and which has a horizontal pierced diaphragm. If the appliance is to be put in the bath some radial tubes are inserted into the hood of the heater. When it is used from without a pierced pipe that is held up inside the bath conveys the hot air or vapour, both the hood and the delivery pipe being jacketed.

3,528.—TUBES FOR LEVELS: *J. F. Hicks*.—The inventor seeks to obviate the bursting of the tube through the expansion of the contained fluid by heat. He fills it in part with solid matter such as balls, beads, &c. of metal, pottery, glass, and other resistant materials.

MEETINGS.

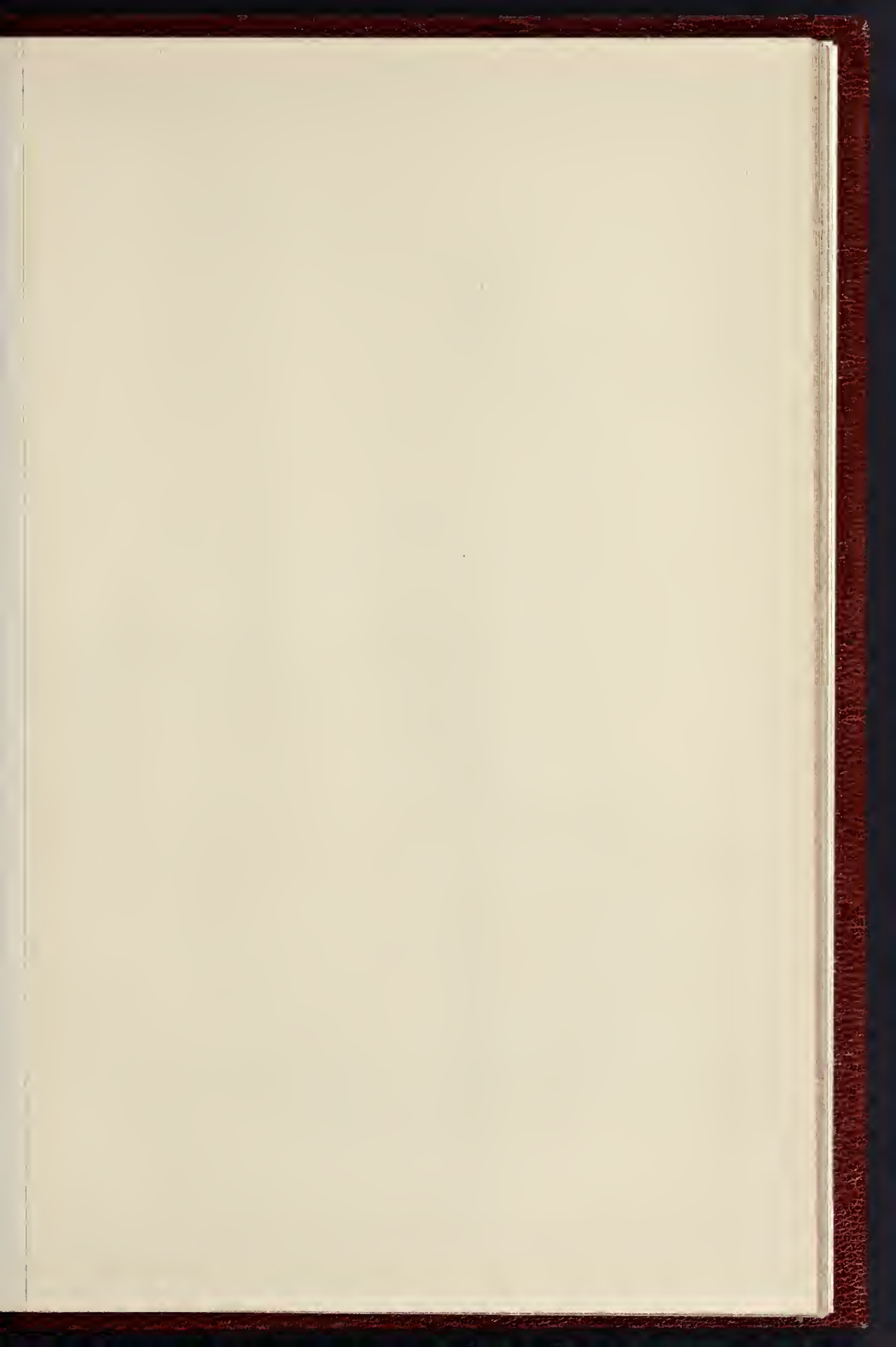
SATURDAY, JUNE 22.
British Institute of Certified Carpenters.—Visit to Hampton Court Palace. 3 p.m.

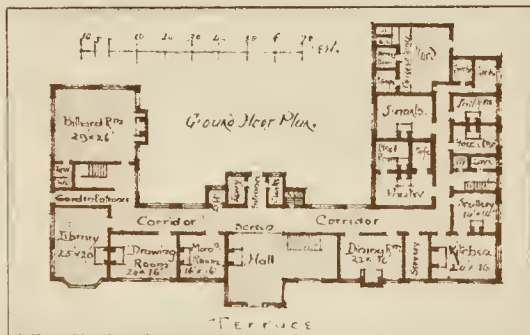
WEDNESDAY, JUNE 25.
Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting of the directors. 8 p.m.
SATURDAY, JUNE 29.
Architectural Association.—Visit to Colney Chape Convent, St. Albans.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 3.—By HEEPER & SONS (at Ripon). Markington, &c., Yorks.—Farnley Grange Farm, 23 a. 3 r. 9 p. f. 1,400	4,160
June 6.—By J. R. EVE & SON (at Kivsheden). Wynton, Beds.—The Lodge Farm, 18 a. 1 r. 27 p. f. 1,480	1,480
By LANGRIDGE & FREEMAN (at Maidstone). Chatham, Kent.—Part of White's Wood and Bradford Wood, 16 a. 3 r. 8 p. f. 3 0	3 0
Robin Hood Farm, 29 a. 3 r. 29 p. f. 2,465	2,465
Aylesford, Kent.—Taddington Wood, &c., 150 a. 2 r. 22 p. f. 1,125	1,125
Bosley, Kent.—Endures of woodland, 65 a. 2 r. 11 p. f. 815	815
Yalding, Kent.—Five freehold cottages. 630	630
By SEDGWICK, SON, & WEALL (at Uxbridge). Ruislip, Middlesex.—St. Catherine's Knoll, freehold cottage, farm buildings, and 7 a. 0 r. 5 p. Bury-st., The Berries, f. c. r. 201. 285	285
Harefield, Middlesex.—The Hollies, and 1 a. 3 r. 29 p. f. 1,370	1,370
June 7.—Messrs. J. RUSSELL & SON. Norwich.—Newmarket-rd., three building sites, f. 34 to 44 (even), Northumberland-st., f. 1,300	1,300
By H. F. RUSSELL & SON (at Leominster). Eardisland, Herefordshire.—Estate, 176 a. 3 r. 26 p. f. 8,400	8,400
By D. A. H. PRICE (at Clacton). Clacton-on-Sea, Essex.—Old-rd., seven plots of building land, f. c. r. 201. 750	750
By A. C. LOWE (at Exeter). Dreweington, Devon.—Wallon and Weir Mill Estate, 143 a. 3 r. 13 p. f. 3,500	3,500
By JONES, LANG, & CO. Bishopscote, Leicestershire.—Without and 1, Victoria-av., f. r. 601. 22,000	22,000
City of London.—91, Forest-st., u. t. 83 yrs., g. r. 2001, f. 601. 3,000	3,000
30, Monkwell-st., u. t. 271 yrs., g. r. 501, f. 371. 2,300	2,300
Finsbury Park.—31, Woodstock-rd., u. t. 66 yrs., g. r. 61, 105, f. 361. 370	370
By TOPPIS & HARRING. Paddington.—Bishop's-rd., l. g. r. 801, u. t. 371 yrs., g. r. 21. 1,270	1,270
Gloucester-gardens, l. g. r. 251, u. t. 371 yrs., g. r. 21. 355	355
June 8.—By C. R. MORRIS, SONS, & PEARD. Trull, &c., Somerset.—Lower Comeytrowe Farm, 137 a. 3 r. 37 p. f. 8,500	8,500
Galmington, Somerset.—House, cottage, and 8 a. 0 r. 0 p. c. 1,265	1,265
Otterford, Somerset.—Tide rent charges 171, 188. 250	250
By J. CARTER JONES & SONS (at Cambridge). Cambridge.—Goldham's-lane, two enclosures of building land, 32 a. 2 r. 11 p. f. 1,600	1,600
June 10.—By FAREBROTHER, ELLIS, & CO. Hamstead.—Pond-st., a freehold building site, area 9,800 ft. 1,500	1,500
By W. H. HOUGHTON. Cavendish-so.—13, Welbeck-st. and 19, Little Welbeck-mews, u. t. 31 yrs., g. r. 701, f. 3101. 2,200	2,200
By INMAN & CRIER. Maida Vale.—203, Sutherland-av., u. t. 38 yrs., g. r. 37, 115, 601, 701. 785	785
By LAING WATERS, FURNIVALL, & CO. Kensington.—3, 5, 7, Kinnoul-rd., f. c. r. 300. 2,250	2,250
By MEYER & HARRING. Edgware-rd.—Nos. 412 and 414, u. t. 241 yrs., g. r. 671, f. 251. 1,140	1,140
By ALEX. PHILLIPS & CO. Kilburn.—26, Messing-av., u. t. 841 yrs., g. r. 91, 105, e. r. 501. 495	495
13 and 21, Plympton-rd., u. t. 881 yrs., g. r. 191, 95. 1,040	1,040
12, Burton-rd., u. t. 83 yrs., g. r. 101, f. 551. 550	550
Willesden.—49, Cobbold-rd., f. c. r. 295	295
Brompton.—45, St. Oswald-rd., u. t. 61 yrs., g. r. 101, f. 501. 445	445
Kensal Rise.—43, 49 to 57 (odd), Earlsmead-rd., u. t. 88 and 87 yrs., g. r. 301. 1,135	1,135
By RAVENSHAR & MASSEY. Kilburn.—10, Malvern-rd., u. t. 61 yrs., g. r. 81, r. 551. 650	650
By RENTON & RENTON (at Harrogate). Birstwith, &c., Yorks.—Crow Trees Farm, 83 a. 2 r. 24 p. f. 2,660	2,660
Slack Dyke Farm, 7 a. 0 r. 2 p. c. 615	615
Staup's House Farm, 14 a. 1 r. 18 p. c. 870	870
By C. B. SMITH, SAFF, & WYATT (at Fareham). Titchfield, Hants.—Bedrock's Paddock, o. a. 3 r. 20 p. f. 100	100
Stephen Bridge Enclosure, 7 a. 1 r. 15 p. f. 60	60
By CURTIS & SHARP (at East Ham). East Ham.—51, Olave-rd., &c., 43 plots of freehold building land, l. g. r.'s 681, u. t. 1,713	1,713
June 11.—By DAVID BURNETT & CO. Blackheath.—Shooter's Hill-rd., l. g. r.'s 681, u. t. 581 yrs., g. r. 111. 1,415	1,415
Hitchin, Herts.—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. 615	615
Sydenham.—Wells-rd., &c., l. g. r.'s 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300. 585	585
By DEERHAM, TRUSON, & CO. Purley, Surrey.—Foley and 18 a. 1 r. 12 p. f. 7,000	7,000
Camden Town.—89, York-rd., u. t. 501 371, g. r. 51, e. r. 451. 450	450
Chislehurst, Kent.—3, Sumner Hill villas, f. r. 651. 750	750
Godstone, Surrey.—Highway, Oakhurst and 3 a. 0 r. 24 p. f. 1,501. 2,000	2,000
By FRASER & HEIGH. Holloway.—133, Tufnell Park-rd., u. t. 67 yrs., g. r. 81, f. 451. 400	400
By WALTER HALL. Stoke Newington.—95 and 97, Shakespeare-rd., f. r. 551. 1,115	1,115

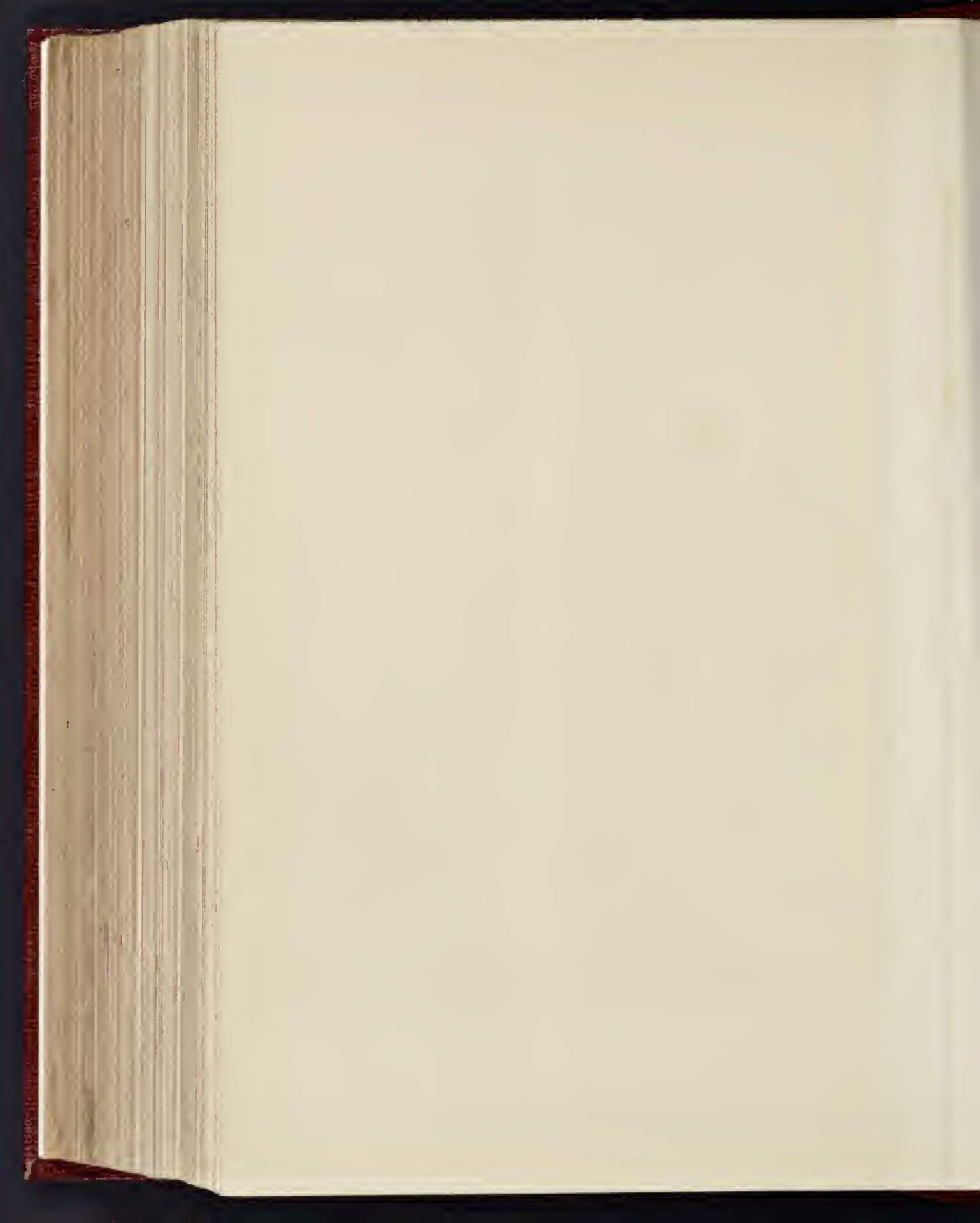


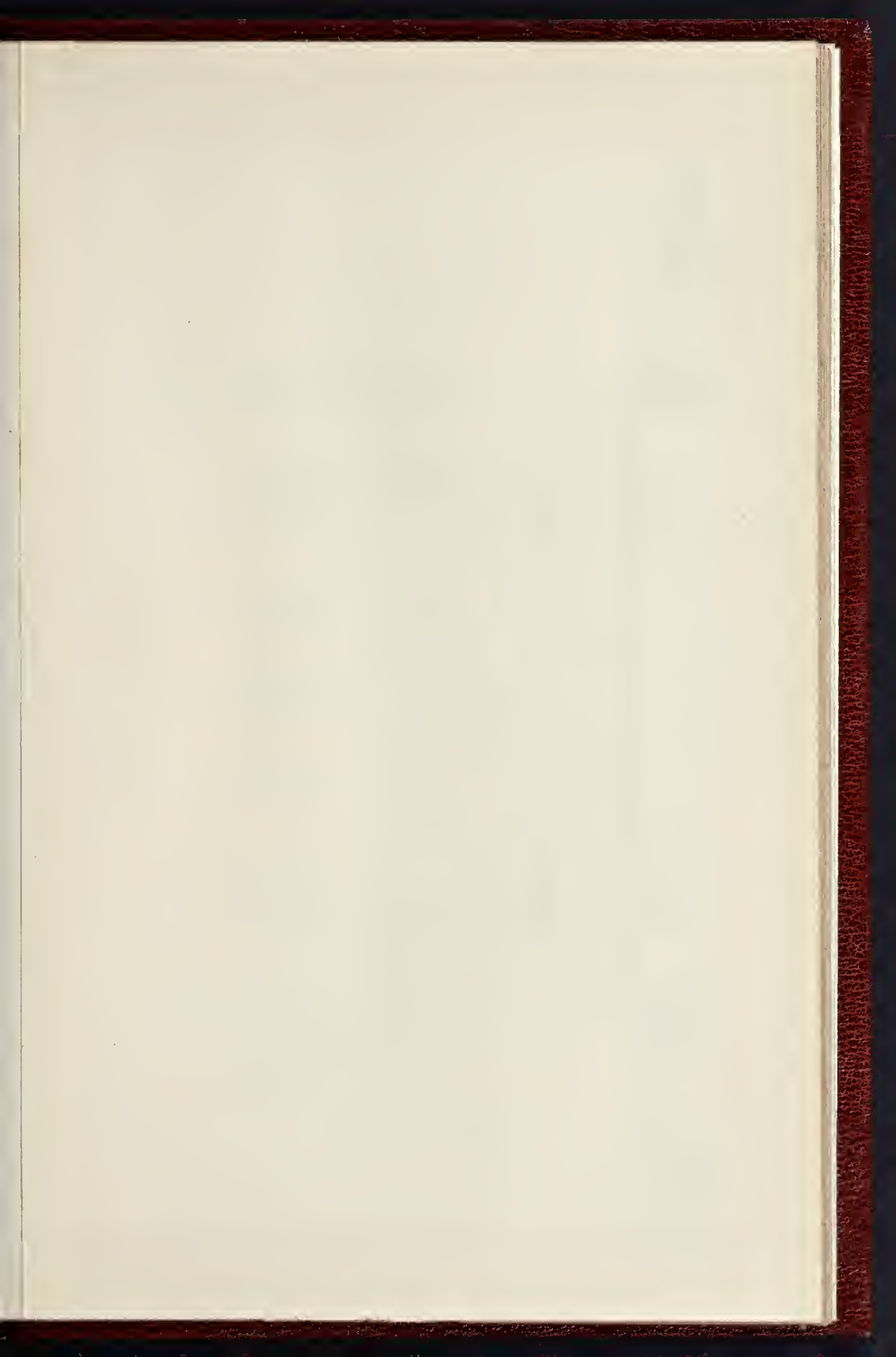


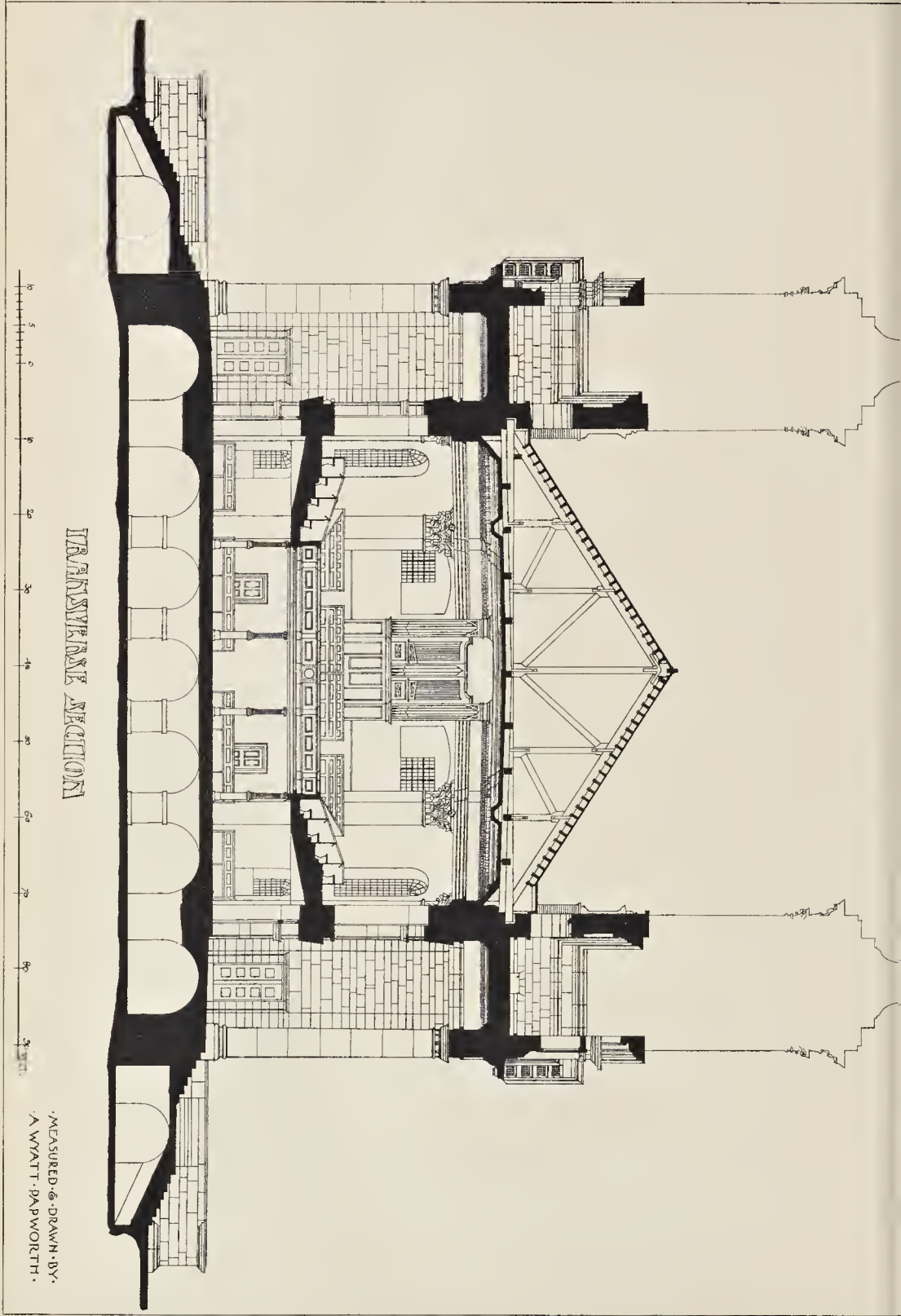
'The Towers' Devonshire
Chas. R. Dibble } Joint
H.F. Waring } Architects



INK PHOTO SPRAGUE & CO. LTY. 4 & 6, EAST HARDING STREET, FETTER LANE, E.C.



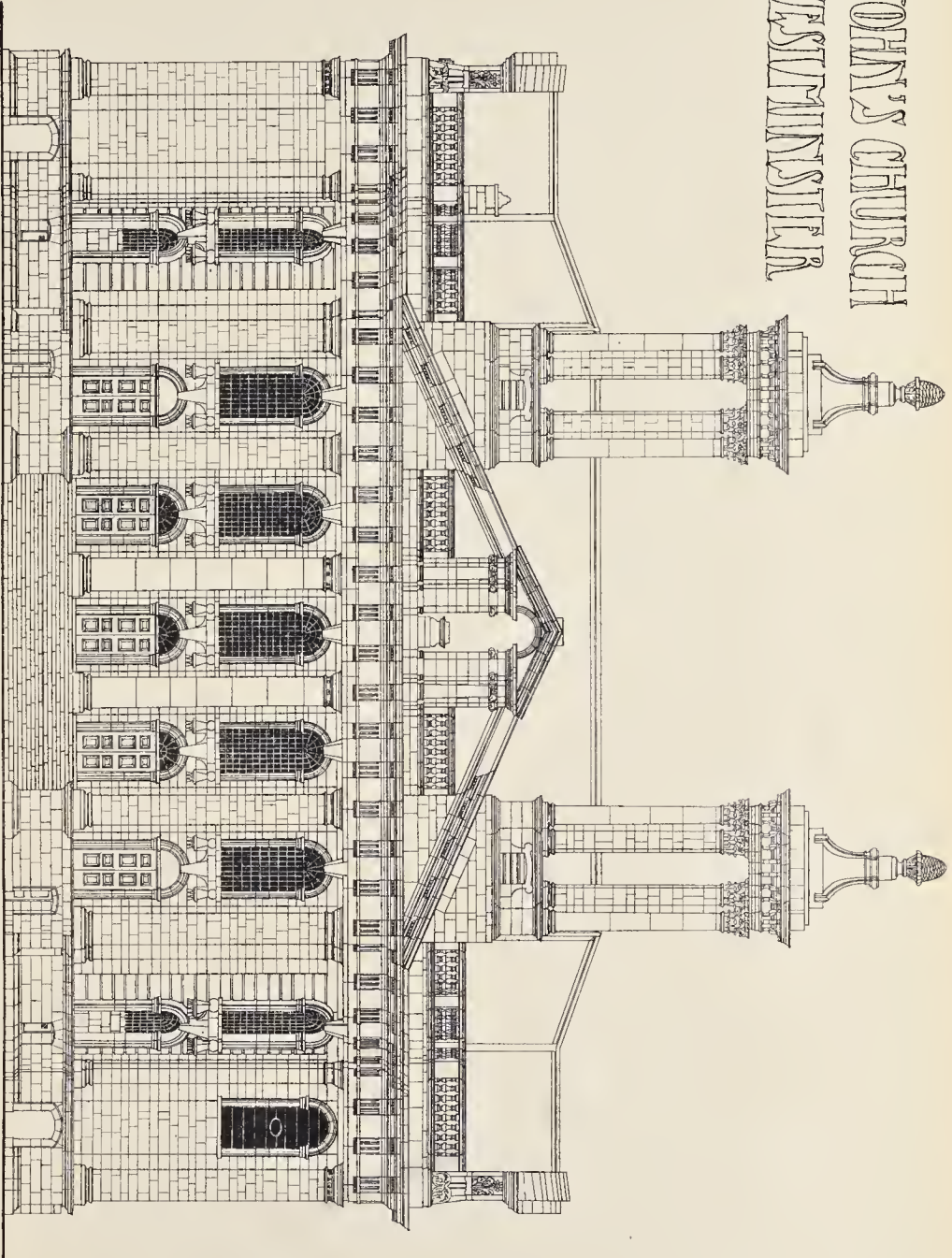




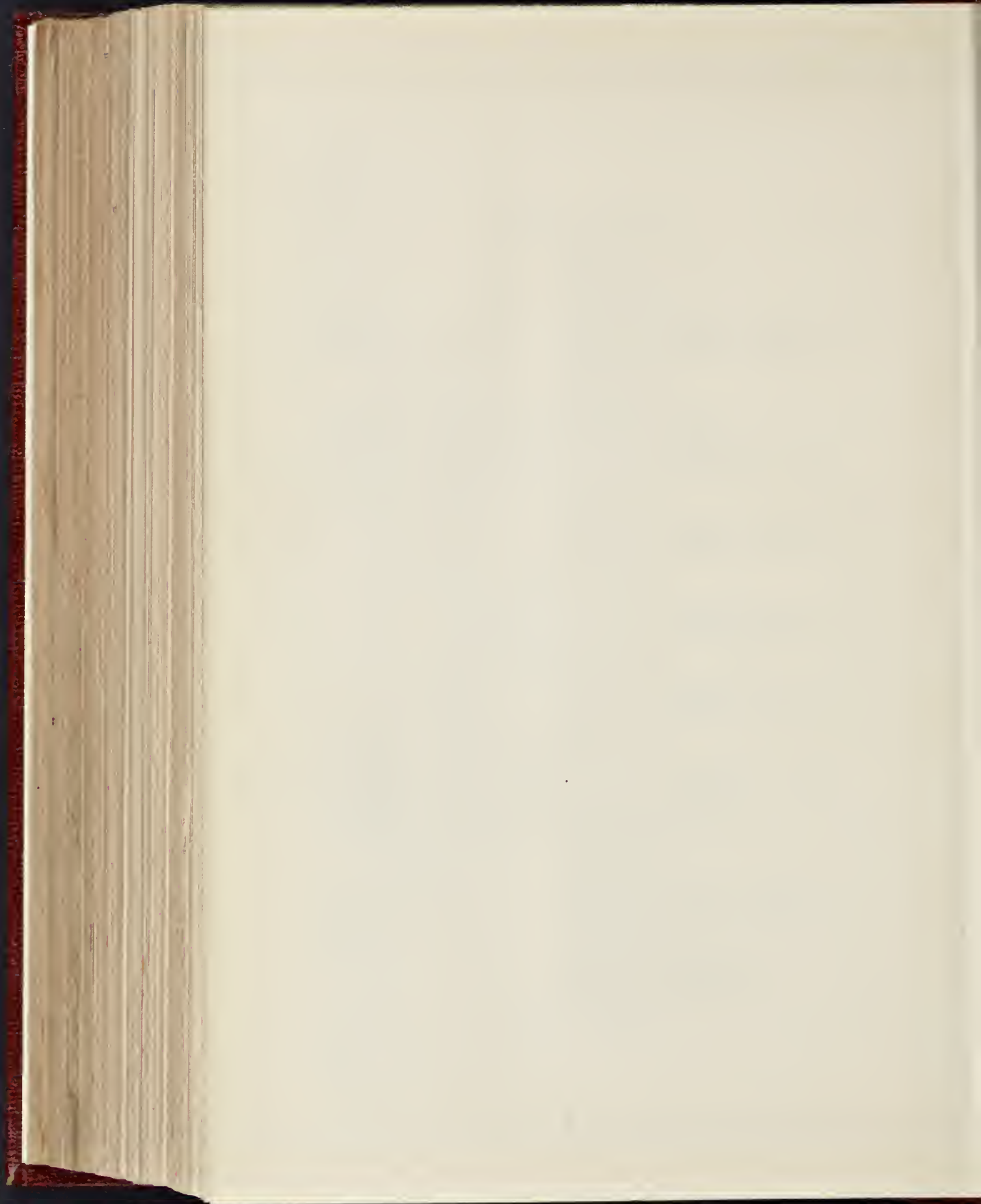
TRANSVERSE SECTION

MEASURED & DRAWN BY
A. WYATT-BAPWORTH.
PHOTOGRAPHED BY S. C. 17, 45, 51, 57, HARROLD STREET, FETTER LANE E.C.

ST JOHN'S CHURCH
WESTMINSTER



SOUTH FRONT ELEVATION



By HAMPTON & SONS.

Hampstead.—E. Heath-rd., Foley House, area 3 a, u.t. 78 yrs, g.r. 1504, r. 2001. 4,500
 1 and 4, Foley-av., u.t. 78 yrs, g.r. 604, r. 3632. 4,250

Needham Market, Suffolk.—Uvedale Hall and 8 a, f. 3,000
 Uvedale Farm, 22 a, f. 2,000
 Coddham-rd., two freehold cottages. 250
 Chelsea.—31, Sydney-st., f. r. 654. 1,100

By HARRALD & SONS.

Edgware, Middlesex.—High-st., the Manor Park Building Estate, 3 a, r. 1. 35 p. f. 2,400

By READ & LANDFIELD.

Ealing.—11, Harrington-rd., u.t. 74 yrs, g.r. 64, r. 21. 440
 By ROGERS, CHAPMAN, & THOMAS.

South Kensington.—7, Evelyn-gardens, u.t. 72 yrs, g.r. 256, r. 2001. 2,500
 By ALFRED RICHARDS (at Ennis Highway). 4,300
 By JAMES HARRIS & SONS (at Winchester). 3,600
 Martyr Worthy, Hants.—The Shriner House Estate, 42 a, f. r. 39 p. f. 6,000
 By ALFRED RICHARDS (at Ennis Highway). 860
 Albany-rd., f.g.r. 87, reversion in 91 yrs. 180
 30 and 32, St. Stephen's-rd., f. 295
 By FLEURET, SONS, & JAMES (at Masons' Hall Tavern). 2,000

Hackney.—Wick-rd., The General Ground (office), u.t. 58 yrs, g.r. 64, with goodwill By OCHTIL, MARKS, & OCHTIL (at 43 Yorks' Tavern). 2,000

Redhill, Surrey.—Laker's Hotel, u.t. 43 yrs, g.r. 206, with goodwill 9,990
 By C. PLATT & SONS (at Ennis Highway). 5,900
 Hammersmith.—81, Shaftesbury-rd., u.t. 52 yrs, g.r. 64. 465
 Shepherd's Bush.—10, Ellingham-rd., u.t. 86 yrs, g.r. 34, r. 2. 3,800
 By J. H. DONALDSON & SON.

Croydon.—Lennard-rd., Lennard House, f. r. 602. 3,050
 74, 105, & 32, College-av., u.t. 80 yrs, g.r. 74, 105, & 32. 2,400
 Kingsland.—4, Englefield-rd., u.t. 24 yrs, g.r. 54, r. 324. 305
 By P. & GREEN.

Harlesden.—27, Greenhill-st., u.t. 87 yrs, g.r. 74, 105, & 32. 350
 Acton.—89, Bolo Bridge-rd., u.t. 75 yrs, g.r. 64. 155
 Stepey.—Dempsey-st., f.g.r. 214, u.t. 12 yrs. 115

Blackfriars.—95, Stamford-st., u.t. 87 yrs, g.r. 854. 125

By GURDNER & SONS.

Westmore, Hants.—Hall face and 26 a, r. 22 p. f. 5,000
 By MESSRS. JEFFRIES.

Twickenham, Colne-rd., The Wheatsheaf Fireworks, u.t. 48 yrs, r. 154. 6,000

By MANSFIELD & ROWE.

Norwood.—7, Osford-rd., f. 340
 155, Hamilton-rd., u.t. 950 yrs, g.r. 24. 225
 7, Anclief-grove, u.t. 53 yrs, g.r. 84, r. 201. 130
 15 and 17, Parphar-st., 59 yrs, g.r. 54, r. 1507. 855

By MILLAR, SON, & CO.

Mile End.—62 to 70 (evens), Nicholas-st., area 4,500 ft. 1,410
 By W. R. NICHOLAS & CO.

Ingatstone, Essex.—Fryerning Grange and 42 a, r. 2 p. f. 4,600
 Cranleigh, Surrey.—Hill-st., 32 or, 3 p. f. 7,350

By S. WALKER & SON.

Holborn.—Nos. 148 and 149, also 1 and 2, Holborn-bldgs., area 7,000 ft. f. 25,000
 By DEAN & WILSON.

Stockwell.—3, Willington-rd., u.t. 36 yrs, g.r. 44, 108. 250
 Clapham.—2, Albert-sq. and 3, Albert-sq.-mews, u.t. 44 yrs, g.r. 64. 620
 Pinick.—26, Bessborough-st., 32 yrs, g.r. 104, r. 754. 540

By BARKER, FAYNE, & LEPPER.

Westerham, Hill, Kent.—Southwood and 603 a, f. 2,000
 Bexley Heath, Kent.—1 and 2, Victoria-villas, f. r. 504. 600

By W. WALKER & SONS (at Driffell).

Skipsay, Yorks.—Dringhoe Grange Farm, 37 a, 2, 17 p. f. and c. 7,000
 By BALCH & BALCH (at Camden Town).

Kenil Town.—35, Islip-st., u.t. 48 yrs, g.r. 84, 88, & 404. 1,390
 Holloway.—1, 26, 28, 43, and 45, Foyling-st., u.t. 70 yrs, g.r. 314, r. 187. (in lots). 1,950

By LOUND & HOWITT (at Horse Shoe Hotel).

Richmond, Surrey.—Hill-st., the White Hart p-b, u.t. 184 yrs, r. 484, with goodwill 1,210
 By WIL WESTON (at Paddington).

Paddington.—12, Lancelotti-st., u.t. 72 yrs, g.r. 54, r. 394. 500
 25, Clifton-villas, u.t. 49 yrs, g.r. 64. 495
 61, Walerton-rd., u.t. 62 yrs, g.r. 64. 495

Westbourne-pk.—35, 87, and 89, Cornwall-rd., u.t. 62 yrs, g.r. 64. 1,630
 Kensal Rise.—10, Greyhound-rd., 31 yrs, g.r. 54. 240

June 15.—By DANIEL WATNEY & SONS.

Beddington, Surrey.—Boxley-lane, enclosures of land, 109 a, f. 16 p. f. 2,300
 Woodcote-rd., two cottages and 2 a, 2 r. 7 p. f. 3,040
 Regent's Park.—17, Cumberland-ter., u.t. 24 yrs, g.r. 174, 108. 1,000

By R. W. DEXTER & CO.

Staplehurst, Kent.—Meadhurst and 4 a, 2 r. 38 p. f. 500

By DOUGLAS DEVERELL.

Brondebury.—146, Mayers-rd., u.t. 73 yrs, g.r. 84. 450
 Hampstead.—63, Gascony-av., u.t. 80 yrs, g.r. 74. 455

By FARRINGTON, BAKER, & CO.

Camden Town.—148 and 150, High-st., u.t. 67 yrs, g.r. 884, r. 4001. 5,200

By C. C. & T. MOORE.

Algate.—59, Middlesex-st., f. r. 1504. 2,450
 Whitechapel.—134, f. r. 1504. 2,450
 Bethnal Green.—5, 7, 9, and 11, St. Peter-st., u.t. 12 yrs, g.r. 124. 350
 Homerton.—35 and 36, Churchill-rd., f. 825

Poplar.—765 to 177 (odd), Manchester-rd., u.t. 498 yrs, g.r. 204. 620

By H. ROW.

Roehampton.—Alton-rd., two plots of building land, f. 720
 By NEWBORN, EDWARDS, & SMITH, D.

Highbury.—5, 9, 21, 17, and 21, Battledan-rd., u.t. 84 yrs, g.r. 404, 108, r. 214. 2,090
 Bowes Park.—2 to 18 (even), Marlborough-rd., u.t. 82 yrs, g.r. 434, 118, 94. 1,660
 5 to 14, Theocord-st., 91 yrs, g.r. 374, 228. 865

Highbury.—37, Aubert Park, u.t. 76 yrs, g.r. 34, f. 454. 500
 Highbury Hill, lig. r. 104, u.t. 76 yrs, g.r. 34. 145

Pentonville.—24, 25, and 26, Hermes-st., and 39 to 44, Henry-st., u.t. 37 yrs, g.r. 2104. 1,820
 Hoxton.—42 to 45, Alerton-st., u.t. 64 yrs, g.r. 134, 108. 165
 Westminster.—40 to 46 (even), Horseferry-rd., 1 to 5, Carpenter-st., and 39, Romney-st., u.t. 10 yrs, g.r. 1704. 605
 48, 50, and 52, Horseferry-rd. and 8 to 12, Carpenter-st., u.t. 10 yrs, g.r. 1304. 350
 30, 38 to 46 (even), Romney-st., u.t. 10 yrs, g.r. 904. 500

By STIMSON & SONS.

Camberwell.—129 to 130 (odd), 125, 127, and 29, Knatebull-rd., u.t. 743 yrs, g.r. 374, r. 2084. (in lots). 3,995
 1 to 17, 19A, 22, 23, and 24, McDowall-rd., u.t. 743 yrs, g.r. 517, 108, r. 754, 128. 8,610
 Camberwell.—2, County-grove, u.t. 704 yrs, g.r. 54, r. 424. 530
 18 and 20, Penford-st., u.t. 664 yrs, g.r. 144, r. 904. 910
 2, Paulet-rd., u.t. 664 yrs, g.r. 24, r. 454, 128. 550
 113 to 110 (odd), and 109, Burton-rd., u.t. 73 yrs, g.r. 324, 108, r. 224. 2,245

By JOSEPH STOWER.

Balham.—17, 121, 123, 125, 127, and 129, Bedford Hill, u.t. 64 yrs, g.r. 1124, 108, r. 4704. (in lots). 2,910
 Send, Surrey.—Enclosure of meadow land, 15 a, f. r. 29 p. f. 450

By J. A. & W. THARR.

Holborn.—70, Red Lion-st., f. r. 1004. 2,270
 Walthamston.—123, 125, and 127, Chelmsford-rd., also f.g.r. 44, reversion in 20 yrs. 675
 Bethnal Green.—12, 13, and 14, Satchell-st., u.t. 48 yrs, g.r. 134, 108. 750
 Holloway.—182 and 184, Tufnell Pk.-rd., u.t. 66 yrs, g.r. 204. 1,330
 Hackney.—102 to 110 (even), Goldsmith's row, and 6 to 10, Oakford-rd., u.t. 22 yrs, g.r. 124. 1,675
 Leyton.—19 to 27 (odd), Manby-rd., u.t. 77 yrs, g.r. 174, 108. 760

June 14.—By W. A. BIRMINGHAM.

Catford.—1, 3, and 5, Jutland-rd., u.t. 924 yrs, g.r. 154. 795
 19 to 39 (odd), Jutland-rd., u.t. 924 yrs, g.r. 154. 2,600
 79 to 85 (odd), Englebart-rd., u.t. 924 yrs, g.r. 204. 970
 80 to 92 (even), Brownhill-rd., u.t. 924 yrs, g.r. 144. 1,835
 141 and 143, Brownhill-rd., u.t. 924 yrs, g.r. 124. 650
 Old Kent-rd.—356, East-st., u.t. 87 yrs, g.r. 104. 300

By J. I. & W. A. WEAVER.

Kilburn.—21, Kilburn-sq., u.t. 23 yrs, g.r. 74, r. 404. 235
 Enfield Lock.—1, Eingeter, f. 150

Dulwich.—1, Ashbourne-grove, u.t. 69 yrs, g.r. 64, r. 324. 335
 57, Glengarry-rd., u.t. 79 yrs, g.r. 64, 68, r. 324. 290

By MORRIS & HIRSTON.

Penge.—91, Maple-rd., u.t. 64 yrs, g.r. 124, 128, r. 514. 280

Contractions used in these lists.—F.g.r. for freehold improved ground; l.g.r. for leasehold ground; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; c.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; y. for years; s. for street; rd. for road; s. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

* Our aim in this list is to give, as far as possible, the average prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Hard Sticks — 14 0 per 1,000 alongside, in rive-rough sticks and 5 s. d.

Grizles — 1 11 0 " " " " " "

Facing Sticks — 2 12 0 " " " " " "

Shippers — 2 8 0 " " " " " "

Fleets — 1 8 6 " " " " " "

Red Wire Cuts — 1 14 6 " " " " " "

Best Carboneau — 3 11 0 " " " " " "

Best Red pressed Ruabon Facing. 5 0 0 " " " " " "

Best Blue Pressed Staffordshire. 4 4 6 " " " " " "

Do, Bullnose. 4 9 0 " " " " " "

Best Stourbridge Fire Bricks. 4 2 6 " " " " " "

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers. 13 0 0 " " " " " "

Headers. 12 0 0 " " " " " "

Quoins, Bullnose, and Flats. 17 0 0 " " " " " "

Double Stretchers. 19 0 0 " " " " " "

Double Headers. 16 0 0 " " " " " "

One Side and two Ends. 19 0 0 " " " " " "

Two Sides and one End. 20 0 0 " " " " " "

Spays Channeled. 18 0 0 " " " " " "

Squints. 20 0 0 " " " " " "

Best Dipped Salt Glazed Stretchers and Headers. 12 0 0 " " " " " "

PRICES CURRENT (Continued).

BRICKS, &c.

Quoins, Bullnose, &c. s. d.

and Flats. 14 0 0 per 1,000 at railway dep't.

Double Stretchers. 15 0 0 " " " "

Double Headers. 14 0 0 " " " "

One Side and two Ends. 15 0 0 " " " "

Two Sides and one End. 15 0 0 " " " "

plays Channeled. 14 0 0 " " " "

Squints. 14 0 0 " " " "

Seconds Quality. 14 0 0 " " " "

White and Dipped Salt Glazed. 2 0 0 " " less than best

Thames and Pit Sand. 7 3 per yard, delivered.

Thames Ballast. 6 0 " " " "

Best Portland Cement. 35 0 per ton, delivered.

Best Ground Blue Lias Lime. 25 6 " " " "

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime. 135 6d. per yard, delivered

Stourbridge Fire-clay in sacks, 28s. 0d. per ton at rly. dep't.

STONE.

Ancaster in blocks. 2 0 per ft. cube, del'd. rly. dep't.

Barb. 1 2 " " " "

Farleigh Down Bath. 1 2 " " " "

Beer in blocks. 1 6 " " " "

Grinbill. 1 10 " " " "

Brown Portland in blocks. 2 2 " " " "

Dudley Dale in blocks. 2 11 " " " "

Red Corsebill. 2 5 " " " "

Red Mansfield. 2 4 " " " "

Hard York in blocks. 2 10 " " " "

Hard York 6 in. sawn both sides landings, to sizes s. d. 2 8 per ft. super. (under 40 ft. sup.) at rly. dep't.

" " 6 in. Rubbed Ditto. 3 0 " " " "

" " 3 in. sawn both sides slabs (random sizes) 1 3 " " " "

" " 1 in. self-rd'd. Ditto. 0 8 " " " "

Hopton Wood (Hard bed) in blocks 2 3 per ft. cube, del'd. rly. dep't.

" " 6 in. sawn both sides landings 2 7 per ft. super. del'd. rly. dep't.

" " 3 in. do. 1 2 " " " "

SLATES.

in. in. s. d.

10x10 best blue Bangor. 11 5 0 per 1000 of 1200 at rly. dep't.

" " best seconds. 10 15 " " " "

16x8 best " 6 2 6 " " " "

10x10 best blue Portna. 10 18 0 " " " "

16x8 best blue Portna. 6 0 0 " " " "

10x10 best Eureka. 11 2 6 " " " "

16x8 " 6 15 0 " " " "

10x10 Permanent green. 10 0 0 " " " "

16x8 " 6 12 6 " " " "

TILES.

Best plain red roofing tiles. 41 6 per 1,000 at rly. dep't.

Hip and valley tiles. 3 7 per doz. " " " "

Best Brossley tiles. 48 6 per 1,000 " " " "

Hip and valley tiles. 4 0 per doz. " " " "

Best Ruabon Red, brown or brinded Do. (Edwards) 57 6 per 1,000 " " " "

Do. ornamental Do. 50 0 " " " "

Hip tiles. 4 0 per doz. " " " "

Valley tiles. 3 9 " " " "

Best Red or Mottled Staff. fordshire Do. (Peakes). 50 9 per 1,000 " " " "

Hip tiles. 4 1 per doz. " " " "

Valley tiles. 3 8 " " " "

WOOD.

BUILDING WOOD.—YELLOW.

Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. 16 10 0 18 0 0 14 10 0 15 10 0

Battens: best 2 in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in. 12 0 0 13 0 0 10 0 0 less than 9 in. and 8 in. best

Battens: best 2 1/2 by 6 and 3 by 6. 10 0 0 11 0 0 10 0 0 11 0 0 9 10 0 11 0 0 2 in. by 4 in. and 2 in. by 6 in. 2 in. by 4 in. and 2 in. by 5 in. 9 0 0 10 10 0

Foreign Sawn Boards.—At per standard.

3 in. by 12 in. by 12 in. 10 0 more than battens.

1 in. 1 0 0 more than battens.

At per load of 50 ft.

Fir timber: Best middling Danzig or Memel (average specification) 4 10 0 5 0 0

Seconds. 4 5 0 4 10 0

Small timber (8 in. to 10 in.) 3 12 0 3 15 0

Swedish balks. 2 15 0 3 0 0

Pitch pine timber (3 1/2 ft. average). 3 10 0 4 0 0

White Sea: First yellow deals, 3 in. by 11 in. 27 10 0 28 10 0 3 in. by 9 in. 24 0 0 25 0 0 2 in. by 11 in. and 2 in. by 7 in. 22 10 0 24 0 0 3 in. by 11 in. 20 0 0 21 0 0 3 in. by 9 in. 20 0 0 21 0 0 Battens, 2 1/2 in. and 3 in. by 7 in. 16 10 0 18 0 0 2 in. and 3 in. by 7 in. 16 10 0 18 0 0 Battens, 2 1/2 in. and 3 in. by 7 in. 13 10 0 14 10 0 Petersburg: first yellow deals, 3 in. by 11 in. 25 0 0 26 0 0 Do. 3 in. by 9 in. 22 0 0 23 0 0 Battens. 16 10 0 17 10 0 Second yellow deals, 3 in. by 11 in. 18 10 0 20 0 0 3 in. by 9 in. 17 0 0 18 0 0 Battens. 14 10 0 14 10 0 Third yellow deals, 3 in. by 11 in. 15 0 0 16 10 0 Do. 3 in. by 9 in. 14 10 0 14 10 0 Battens. 12 10 0 13 10 0 White Sea and Petersburg.—First white deals, 3 in. by 11 in. 15 10 0 16 10 0 Do. 3 in. by 9 in. 14 10 0 15 10 0 Battens. 14 10 0 15 10 0

See also next page.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

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

COMPETITIONS.			
Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Baths	Chelsea Borough Council	100 guineas; 50 guineas; 30 guineas	Oct. 1

CONTRACTS.			
Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
School, &c., Havering, Cumberland	Milton School Board	Settle & Farmer, Architects, Board Offices, Milton	June 25
Farmhouse, Buds Farm, Little Torrington, Devon	Mr. J. C. Moore-Stevens	Groves & Co., Surveyors, Eidsford	do.
Laying Pipes (5 miles)	Barnsley Corporation	J. H. Taylor, Borough Surveyor, Barnsley	do.
Car Shed, &c., North End	Portsmouth Corporation	E. Rotter, Civil Engineer, Town Hall, Portsmouth	do.
Additions, &c., to Dyehouse, Gomersal, Yorks.	Messrs. T. Burnley & Sons, Ltd.	W. H. D. Horfall, Architect, Tower Chambers, Halifax	do.
School, St. Luke's-terrace	Brighton School Board	T. Sampson & Son, Surveyors, Ship-street, Brighton	do.
Extensions, City Art-Gallery	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
Warehouse, &c., Westgate-street	Halifax Corporation	J. Lord, Civil Engineer, Town Hall, Halifax	do.
*Granite, &c.	Barnet U.D.C.	See Advertisement	do.
*Road Making, &c., Works	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn	do.
Fire Station, &c., Cumberland Basin	Bristol Corporation	T. H. Yabbcon, Civil Engineer, 53, Queen-square, Bristol	June 26
Reservoir, Wortley	Barnsley Corporation	T. H. Hawksley, Civil Engineers, 36, Great George-street, S.W.	do.
Alterations to Mill, Crowle, near Doncaster	J. H. Lee, Board Schools, Crowle		do.
Additions to Council Offices	Broadstairs, &c., U.D.C.	H. Hurd, Civil Engineer, Council Offices, Broadstairs	do.
Police Station, &c., Norton, Yorks.	Standing Joint Committee	A. Beaumont, Civil Engineer, County Hall, Beverley	do.
Additions to School, Porth	Glanorgon County Council	T. M. Franklin, County Offices, Cardiff	do.
Restoration of Parish Church, Houghton-le-Spring		J. Bendelow, 16, Nesham-place, Houghton-le-Spring, co. Durham	June 28
Residence, Forteach-avenue, Elgin, N.E.		R. B. Pratt, Architect, Elgin	do.
Kerbing, Flags, &c.	Ashton-in-Makerfield U.D.C.	J. W. Liversidge, Surveyor, Council Offices, Ashton	June 29
Rebuilding Bridge, Lachmere Brook, Fortobello	Willesden U.D.C.	R. E. Fellows, Civil Engineer, Town Hall, Willesden	do.
Twelve Dwellings	Wrotham (Kent) U.D.C.	J. Sharp, Surveyor, Borough Green, Wrotham	do.
Business Premises, Mill-street, Clonakilty, Ireland		H. O'Brien, 16, Mill-street, Clonakilty	do.
School, West-lane, Kelghley		Moore & Crabtree, Architects, York Chambers, Kelghley	do.
Widening Barton Hill Bridge	Northumberland County Council	J. A. Bean, Surveyor, Moot Hall, Newcastle	do.
School, Braithwaite, Yorks.		F. Allen, Bank Chambers, Doncaster	do.
Pair Villas, Buarth Mawr, Aberystwyth		G. Jones & Son, Architects, 17, George-street, Aberystwyth	do.
Nine Houses, Victor-terrace, Halifax		M. Hall, Architect, Halifax	do.
Grammar School, Beverley		Dotterill & Co., Architects, 23, Parliament-street, Hull	do.
250 Tons Portland Cement	Wadsworth Borough Council	Council House, East Hill, Wadsworth	July 1
*Widening, &c., of Green Lane Bridge	Great Western Railway	Engineer, Paddington Station	July 2
*Making-up Roads	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
Electric Lighting Buildings	Aldershot U.D.C.	N. F. Dennis, Civil Engineer, Aldershot	do.
Sewer Culverts (4 miles)	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	do.
Additions to Workhouse Laundry	Kingston-on-Thames Guardians	W. H. Hope, Civil Engineer, Hampton Wick	do.
*School	Tydesley-with-Shakerley U.D.C.	See Advertisement	do.
*Road Making and Paving Chapel-street, Forcat Hill	Lewisham Council	Surveyor's Department, Town Hall, Catford, S.E.	do.
*Road Making and Paving Ivy-lane, Brockley	do.		do.
*Offices and Buildings	Cuckfield R.D.C.	Council Offices, Haywards Heath	July 4
*Public Libraries, &c.	Camberwell Borough Council	Borough Engineer, Town Hall Camberwell	July 5
Additions to Workhouse	Huntingdon Guardians	E. Borissow, Architect, 151, High-street, Huntingdon	do.
Bridges, Llangollen	Abergavenny R.D.C.	J. Gill, Surveyor, 4, Brecon-road, Abergavenny	July 8
Police Station, Library, &c.	Leeds Corporation	Bedford & Kitson, Architects, Green-street Chambers, Leeds	do.
*Alterations, &c., to School	Cork District Lunatic Asylum	City Engineer, Municipal-buildings, Cork	July 9
Additions to School, Youghal		H. A. Cutler, Civil Engineer, Municipal-buildings, Cork	do.
Electricity Plant	Mausfield Corporation	E. Hammond, Civil Engineer, 61, Victoria-street, S.W.	July 12
Mortuary Buildings, &c.	Paddington Borough Council	Surveyor's Department, Town Hall, Paddington	July 15
Sewers	Lyme Regis Town Council	Town Hall, Lyme Regis	July 25
Baptist Chapel, Victoria-street, Morecambe		A. Gorton, Architect, 24, The Crescent, Morecambe	No date
Chimney Stack, &c., Llangollen		W. R. Hague, Civil Engineer, Pentrefelin Works, Llangollen	do.
Alterations to Club, Canton, Cardiff		E. Down, Architect, 31, High-street, Cardiff	do.
Rebuilding Chapel, near Abertillery, Mon.		Rev. E. Ball, 52, Gladstone-street, Abertillery	do.
Presbytery and Schools, Redhill		W. Bevan, Architect, 12, Buckingham-street, W.C.	do.
Additions to St. Joseph's House, Hartley, Plymouth		King & Lister, Architects, 8, Princess-square, Plymouth	do.
Four Villas	Tamworth Corporation	H. J. Clarkson, Civil Engineer, 22, Church-street, Tamworth	do.
*Whitewashing and Painting	Mill End Old Town Guardians	J. M. Knight, 35, Bancroft-road, Mill End-road, E.	do.
*Extensions to County Asylum Buildings	Cornwall County Asylum	See Advertisement	do.

PUBLIC APPOINTMENTS.			
Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Architect	Govt. Federated Malay States	3,600 dollars per annum, &c. (see advertisement)	June 29
*Surveyor and Inspector of Nuisances	Leatherhead U.D.C.	250, per annum	July 1
*Highway Surveyor	Hambleton R.D.C.	125, per annum	July 6
*Clerk of Works		34, 10s. per week	No date
*Quantity Surveyor's Assistant		4s. per week	do.
*Assistant	Margate Corporation	21, 2s. per week	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxiv. Public Appointments, pp. xxi. & xxiv.

PRICES CURRENT (Continued).

WOOD.	At per standard.	
	£ s. d.	£ s. d.
White Sea and Petersburg	12 10 0	13 10 0
Battens	14 0 0	15 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
" " 3 in. by 9 in.	11 0 0	12 0 0
" " battens	16 0 0	18 0 0
Pitch pine: deals	10 0 0	11 0 0
Under 2 in. thick extra	30 0 0	33 0 0
Yellow Pine—		
First, regular sizes	22 0 0	24 0 0
Broads (12 in. and up)	24 10 0	26 10 0
Oddments (12 in. and up)	20 0 0	22 0 0
Second, regular sizes	0 3 6	0 4 6
Yellow Pine Oddments		
Kauri Pine—		
Planks, per ft. cube		

PRICES CURRENT (Continued).

WOOD.	At per standard.	
	£ s. d.	£ s. d.
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small	0 2 3	0 2 0
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 0
Dry Wainscot Oak, per ft. sup. as		
inch	0 0 8	0 0 7
inch do.	0 0 7	0 0 7
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as		
inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as		
inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as		
inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0

PRICES CURRENT (Continued).

WOOD.	At per standard.	
	£ s. d.	£ s. d.
American Whitewood Planks—		
Per ft. cube	0 2 3	0 3 0
Prepared Flooring—		
1 in. by 6 in. and 7 in. yellow,		
planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow,		
planed and matched	0 13 0	0 17 6
1 1/2 in. by 6 in. and 7 in. yellow,		
planed and matched	0 16 0	0 1 0
1 in. by 6 in. and 7 in. white,		
planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white,		
planed and matched	0 11 6	0 13 6
1 1/2 in. by 6 in. and 7 in. white,		
planed and matched	0 14 0	0 16 6

PRICES CURRENT (Continued).

JOISTS, GIRDERS, &c.

Table listing prices for Joists, Girders, and other structural materials, including London, ordinary, and galvanized sections.

METALS.

Table listing prices for various metals such as Common Bars, Staffordshire Crown Bars, and Mild Steel Bars.

IRON.

Table listing prices for iron products including Ordinary sizes, galvanized iron, and sheet iron.

Sheet Iron, galvanized, flat, best quality.

Table listing prices for galvanized sheet iron in various sizes and thicknesses.

Best Soft Steel Sheets, 6 ft. by 2 ft.

Table listing prices for best soft steel sheets in various sizes and thicknesses.

Cut nails, 3 in. to 4 in. (Under 3 in. usual trade extras.)

PLASTER, &c.

Table listing prices for plaster, cement, and other masonry materials.

LEAD, &c.

Table listing prices for lead, zinc, and other metal products.

ENGLISH SHEET GLASS IN CRATES.

Table listing prices for English sheet glass in various sizes and thicknesses.

OILS, &c.

Table listing prices for various oils including Lined Oil, Turpentine, and White Lead.

VARNISHES, &c.

Table listing prices for various types of varnishes and finishes.

TO CORRESPONDENTS.

Notice to correspondents regarding article submissions, including instructions on format and payment.

TENDERS.

Notice regarding tenders for construction work, including details on submission and evaluation.

CRESSING (Essex).

Notice regarding the erection of new school buildings and fencing in Cressing, Essex.

KELVEDON (Essex).

Notice regarding the erection of a pair of villas in Kelvedon, Essex.

LERWICK (Shetland).

Notice regarding the erection of a cottage hospital in Lerwick, Shetland.

Masonry.

Notice regarding masonry work and related services.

TO CORRESPONDENTS.

Notice to correspondents regarding article submissions, including instructions on format and payment.

Notice regarding tenders for construction work, including details on submission and evaluation.

TENDERS.

Notice regarding tenders for construction work, including details on submission and evaluation.

COLNBROOK (Middlesex).

Notice regarding the erection of a terrace of cottages in Colnbrook, Middlesex.

HOVE.

Notice regarding the following being accepted by the Town Council in Hove.

Street Masonry and Jobbing Works.

Notice regarding street masonry and jobbing works in Hove.

Supplying and Fitting Ironmongery.

Notice regarding supplying and fitting ironmongery in Hove.

Supplying Joiner Ironmongery.

Notice regarding supplying joiner ironmongery in Hove.

Gas and Water Pipes and Fittings.

Notice regarding gas and water pipes and fittings in Hove.

Paints, Varnishes, and Brushes.

Notice regarding paints, varnishes, and brushes in Hove.

Granite for Road Metalling.

Notice regarding granite for road metalling in Hove.

Supplying Broken Coombe Rock Flints.

Notice regarding supplying broken combe rock flints in Hove.

Price per cub. yard.

Notice regarding price per cubic yard for various materials.

Supplying Hand Picked Hill Flints.

Notice regarding supplying hand picked hill flints in Hove.

J. H. Strivens, Applesham.

Notice regarding J. H. Strivens, Applesham, and other contractors.

Number To be depot and carted.

Notice regarding number to be depot and carted for various materials.

CRESSING (Essex).

Notice regarding the erection of new school buildings and fencing in Cressing, Essex.

Notice regarding the erection of a pair of villas in Kelvedon, Essex.

LERWICK (Shetland).

Notice regarding the erection of a cottage hospital in Lerwick, Shetland.

Masonry.

Notice regarding masonry work and related services.

LONDON.

Notice regarding the erection of a new relief station in London.

LONDON.

Notice regarding the erection of stabling in rear of No. 78, 80, and 82, Smith-street, Kennington.

LONDON.

Notice regarding additions and alterations to printing works at No. 60, East Dulwich-road.

LONDON.

Notice regarding rebuilding 26A, Argyll-street, and alterations at 7 and 8, Little Argyll-street.

LONDON.

Notice regarding alterations at the Queen Victoria, Maple-street, Bethnal Green.

LONDON.

Notice regarding the erection of male staff quarters, South Wharf, Rotherhithe, S.E.

LONDON.

Notice regarding decorative and sanitary repairs and electric light installations.

LONDON.

Notice regarding decorative and sanitary repairs and electric light installations.

PURLEV.

Notice regarding new carpenter's shop and bath accommodation, sanitary and heating apparatus.

LONDON.

Notice regarding decorative and sanitary repairs and electric light installations.

PURLEV.

Notice regarding new carpenter's shop and bath accommodation, sanitary and heating apparatus.

LONDON.

Notice regarding decorative and sanitary repairs and electric light installations.

[See also next page.]

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders:—

Running contracts for the supply of various articles of furniture, &c. :—

	E.C.S. Boards (large).	E.C.S. Boards (small).	Interior Notice Boards.	Managers' Boards.	Play-ground Notice Boards.	Classed Boards for E.C.S. Schools.	Honour Boards for Graded Schpols.	Honour Boards for Pupil Teachers' School.
	per doz.	per doz.	each.	per doz.	each.	each.	each.	each.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Lonnie & Co.	10 10 0	9 15 0	1 0 0	5 0 0	0 17 6	1 9 6	2 15 0	2 12 0
General Builders, Limited	9 0 0	6 0 0	0 12 6	2 10 0	0 10 0	—	1 15 0*	1 13 0
Bruce, Croom & Co.	9 3 0	7 10 0	0 11 9	4 10 0	0 11 3	—	1 15 9	1 13 0
R. H. Galbraith	6 18 0	4 19 0	0 9 9	2 10 0	0 8 3	1 5 6*	1 17 6	1 12 6*
W. H. Lascelles & Co.	7 10 0	4 10 0	0 6 9	2 2 0	0 6 9	1 12 6	2 6 0	2 3 0
H. Bonneau	5 17 0*	4 10 0*	0 6 8*	1 19 0*	0 7 6*	1 8 0	1 18 6	1 15 9

	Tray Cup-boards.	Easels, No. 1.	Easels, No. 2.	Easels, No. 3, with T slides.	Easels, No. 4, with T slides.	Art Easels.	Desks for Cookery Centres, with back-rail.	Desks for Cookery Centres, without back-rail.
	each.	each.	each.	each.	each.	each.	per doz.	per doz.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
G. M. Hammer & Co., Ltd.	6 18 0	0 6 10	0 8 6	0 9 6	0 10 6	0 10 6	15 18 0	14 0 0
H. Bonneau	7 0 0	0 8 0	0 10 0	0 11 3	0 12 11	0 3 6	—	—
London School Furnishing Company	7 17 6	—	—	—	—	—	—	—
Bruce, Croom, & Co.	10 13 6	—	0 10 6	0 11 0	0 15 0	0 5 3	15 0 0	13 16 0
T. Cruwys	10 0 0	0 11 0	0 11 6	0 12 0	0 12 6	0 7 6	—	—
Wake & Dean, Ltd.	—	0 7 9	0 9 0	0 9 6	0 11 0	0 4 0	—	—
Educational Supply Association, Ltd.	—	0 9 9	0 11 3	0 14 6	0 17 0	0 3 10	15 8 0	13 16 0

	Gully Lades (large) each.	Gully Lades (small) each.
	s. d.	s. d.
H. A. Leighton	2 0	1 11
Pearson, Limited	0 10	0 8
Bird & Co.	0 9	0 7
Trueman & Co.	0 8	0 5

Gas Coppers for Schoolkeepers.

Brightside Foundry and Engineering Co., Ltd.	£2 8 0
Davis Gas Stove Co. Ltd.	11 8 6
Pearson, Limited	1 3 6
Fryke & Palmer	0 17 7

This price is for a supply of twenty-four coppers. The committee recommend the acceptance of the tender which is marked with an asterisk (*) in each case.

ST. JOHN'S SCHOOL, HALLEY-STREET, LIMEHOUSE.—For repairing furniture:—

J. E. Tuckett	£30 0 0	Wake & Dean, Limited	£18 7 0
E. Spencer & Co.	21 10 0	Educational Supply Association,	
H. Bonneau	21 4 6	ply Association,	
R. H. Galbraith	21 2 6	Limited	14 6 6

The committee recommend the acceptance of the lowest tender.

C. B. N. SNEWIN & SONS, LD.

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, 30, & 31, BAY STREET, FAREINGDON ROAD, E.C.

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The Builder.

VOL. LXXX.—No. 3047.

UNE 29, 1914.

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Fowey Hall, Cornwall.—Mr. C. E. Sayer, A.R.I.B.A., Architect	Double-Page Photo-Litho.
Design for an Awkward Corner.—Mr. H. A. Matar, F.R.I.B.A., Architect	Double-Page Ink-Photo.
A Study for a Small Country House.—Mr. J. H. Seller, Architect	Double-Page Photo-Litho.

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The Fire Prevention Exhibition at Berlin.



THE very interesting exhibition of all matters connected with the prevention and combating of fire which is now open at Berlin, and which will remain open until the end of

September, is well worthy of a visit from all those who are interested either in the prevention of conflagrations or in dealing with them when they arise.

The Exhibition is situated in the suburb of Charlottenburg, on the Kurfürstendamm, just outside the limits which the expansion of Berlin in the western direction has already reached, and between the city and the charming suburb of Grönewald. The buildings for the Exhibition have been specially erected for the occasion on a site with an area of rather more than 80,000 square metres, the average width being 230 metres with an average length of 410. The buildings were erected from the designs of Herr Franz Jaffé, the whole of the work being carried out in seventy-four days, at a cost of 450,000 marks, and are constructed in temporary fashion only, with a view to an ephemeral existence, of fir quartering strengthened with light iron construction, and covered with wire lathing and plaster. The Exhibition building proper, including a reception-hall, occupies only some 9,000 square metres. There is therefore a considerable space of ground around the building, which in front, towards the boulevard, is very pleasantly laid out as a garden, with band stands, kiosks, and restaurants; while the area at the rear of the building is devoted to exhibits of various forms of fire-resisting building construction, and spaces for the display of the working of fire-engines and their appliances, including a full-size wooden model intended to represent a lofty building with a tower, such as a fire brigade might be called upon to deal with in the event of a conflagration.

There is also space still further in the rear on which are erected isolated huts where exhibition tests can be given of various forms of fire-resisting construction.

The main entrance from the boulevard is through a well-designed portal flanked by two lofty towers partly decorated in colour, in which the architect has adopted forms of ornament which we are accustomed to associate with our very newest anti-historical school of design. Extending right and left from the main portal in quadrant form are restaurant buildings, which lead gradually up to, though they do not reach, the main Exhibition building. This latter is in the form of a long and comparatively narrow plan, with transeptal ends, thus forming a double T, in the centre of which is a domed assembly-hall of 253 square metres in area, containing seats for 366 persons and standing room for 759. This assembly-hall has a stage on one side, which would permit of the standing room being increased to 1,017. The Exhibition is divided into six sections—1. Fire extinction; 2. Assistance in case of need and danger; 3. Street cleansing, street paving, and cognate works; 4. Fire prevention; 5. The well-being of the personnel of fire brigades; 6. Art, literature, and education.

Section 1, "Fire Extinction," naturally occupies a very large part of the space embraced in the exhibition, and may for convenience of description be subdivided by us under the two headings of Organisation and Equipment of Fire Brigades. The organisation of fire brigades has been particularly the point to which the official exhibitors have directed their efforts. The following cities are represented:—Berlin, Breslau, Cologne, Dortmund, Hamburg, Munich, Nuremberg, Potsdam, Rome, Stuttgart, Turin, Vienna, Augsburg, Bremen, Dantzic, Frankfurt-on-Main, Amsterdam, Posen, Wiesbaden. The various methods in which alarms are arranged, and communications made to the fire brigade, as well as the intercommunication between the various head stations and sub-stations in different towns, are illustrated by plans, and examples

of the various forms of apparatus favoured in each instance.

Particularly noticeable in this respect is the system adopted in Amsterdam, where a very complete installation of telegraphic alarms is in vogue, which has received its latest development in the equipment of every house in one street with a fire alarm communicating with the brigade. In most Continental systems it appears that a tape recording instrument is used rather than semaphores in the stations, though semaphores are automatically displayed in Amsterdam on an alarm being operated either in the street or in a building. Next in the department of organisation comes the arrangement of the fire stations and their inter-communication, which is indicated in plans of the various towns. After this comes a record of the water supply available for the use of the fire brigade and the position of the hydrants. Then the uniform adopted in different localities is illustrated by full-size dressed dummies. One article of the costume of firemen found almost universally on the Continent—although not used with us—is the spring snaphook attached to the belt, by which the men hook themselves on the ladders.

The fitting up of fire stations is well shown in several instances, as, for example, in the full-size model contributed by the town of Bremen, where engine and horses, with stable doors and doors to the engine-house, are all shown by working models.

Various forms of engines and other vehicles are very completely exhibited, both by examples of machines in actual use in different towns as well as by numerous manufacturers who are doing their best, and successfully, to outstrip our English makers—Messrs. Shand, Mason, & Co. and Messrs. Merryweather—from the Continental market.

In the equipment of fire engines a very considerable use appears now to be made on the Continent of carbonic acid machines and of smoke-resisting helmets and dress for enabling firemen to approach very close to the actual seat of the fire. To a far greater extent than with us continental fire brigades

are usually furnished with waggons having ladders capable of being extended to a very considerable height, and a ladder-waggon of this kind appears to be almost invariably an accompaniment to each fire engine section. These ladder-waggons are used by the firemen for approaching the seat of the fire, and in some instances also as fire-escapes. An extensive collection of ladders and escapes is shown by Lieb, of Biberach, one of the largest makers in Germany of this class of equipment. The Electric Railway Carriage Building Company, of Bautzen, exhibit a fine collection of fire engines and fire-brigade vehicles of various kinds, of which they are to-day the largest makers in Germany; but even more interesting than these is the new alloy of aluminium, called "magnalium," which they are introducing for branches, couplings, and other fittings for fire-brigade equipment, and which, whilst possessing almost the lightness of aluminium, is said to be free from the disadvantages of that metal. Certainly the new alloy has met with much favour, and is already in use by several of the leading fire brigades on the Continent.

Fire-alarms are, as exemplified in the Exhibition, almost entirely electrical in the method of communication, whether they are put into operation by hand or automatically. The automatic alarms usually depend on the expansion of metal to make contact and complete the circuit of electric bell systems, as, for example, in that shown by Schöppe, of Leipzig, which can be set to any desired temperature between 10 deg. and 100 deg. Centigrade. At the opposite pole of heat measurement we have an example of a mercurial pyrometer, in which the capability of measurement is extended above the boiling point of mercury by the use of carbonic acid gas under a pressure of 20 atmospheres, so that the instrument will record temperatures up to 550 deg. Centigrade (1,022 deg. Fahr.). This is shown by Schultze, of Berlin.

Section 2, "Assistance in Case of Need and Danger," is exemplified by completely equipped buildings constructed in temporary and portable fashion, and fitted as ambulance stations and temporary hospitals. Conspicuous amongst these are the buildings of the Red Cross Society in Berlin, an organisation somewhat on the lines of our St. John's Ambulance Association, whose buildings are constructed on the Döcker system, made by Christoph & Umnack, of Niesky, of light fir framing filled in with boarding, and put together with screw bolts finished with winged nuts, so as to be capable of easy removal. Internal partitions are chiefly constructed in two thicknesses of painted canvas fitted in wood frames made in sections, so that they also are easily put up and as easily taken down. One of the most interesting exhibits in this section is that of Scherrer's fire escape, shown in an elaborately designed six-story tower, which illustrates how a building of any height can be fitted with casement windows opening outwards, on the inside of which are permanent wrought-iron ladders with movable sections of ladder sufficient to cover the distance between window and window. By operating a single lever, the whole of the casement windows are easily opened, the movable sections of the ladder lowered into position, and thus a complete ladder from the top of the building to the ground is at once put into position at right angles to the building ready for use as a fire escape for persons

within the building or as a means of access for firemen to mount. This invention is exhibited by the Deutsche Rettungsfenster Aktien-Gesellschaft of Beuel-am-Rhein. A somewhat similar invention is exhibited by Rohloff & Possekell on what is called the Giersberg system, but in this instance light wooden balconies and a step-ladder are permanently fixed outside the building, and the windows opening on them are operated by a single lever from the bottom. The balconies and step-ladder can, of course, be, if desired, made of iron instead of wood.

Section 3, "Street Cleansing, Street Paving, and Cognate Works," embraces numerous forms of asphalt and street paving, as well as hydrants and street conveniences, but there is in this section naturally not a great deal of novelty, if we except the very clever suggestion for the use of glass as paving made by the Dresden firm, Aktien-Gesellschaft für Glasindustrie. The question of the cost of glass for such purposes is another matter, and, as stated in the maker's circular, depends upon the quantity. Included in this section is the question of dust and garbage removal, and cleverly designed examples of waggons for these purposes are exhibited by the Salubritä Company of Cologne, in which city the Corporation have seventy of these waggons in use, the merits of which have been also admitted and approved by the police authorities of Berlin.

Section 4, "Fire Prevention," is both one of the most interesting and one of the most extensive sections in the Exhibition, and a great deal of ingenuity has been devoted to the production of novel forms of fire-resisting construction, some undoubtedly valuable from a scientific point of view, others valuable only from a commercial point of view, being merely excuses for building up trade. The use of iron in fire-resisting construction is very generally adopted, and its adequate protection not always sufficiently carried out. There are numerous examples of so-called fire-proof floors, for example, in which the lower flanges of rolled iron joists are left exposed, but there are on the other hand many others in which the protection of the iron is rightly regarded as an imperative necessity.

One material which is largely employed for the protection of iron, especially in columns and stanchions, but also in girders and joists, is cork-stone, a material made of cork dust and various kinds of cement and plaster. As a non-conductor of heat and a slow-burning material this undoubtedly is not without value. Asbestos, in combination with lime, cement, and plaster, is also largely employed in various forms. Kiesel-Guhr or fossil meal, on account of its valuable non-conductive property, is also used in various forms for the protection of iron, in bricks, sheets, and slabs, formed by a combination of Kiesel-Guhr with some cementing compound. Several firms show iron protected by rope made of asbestos, cork, or Kiesel-Guhr and jute, the chief advantage being apparently the ready application of the material, which is then usually finished with a plastered surface.

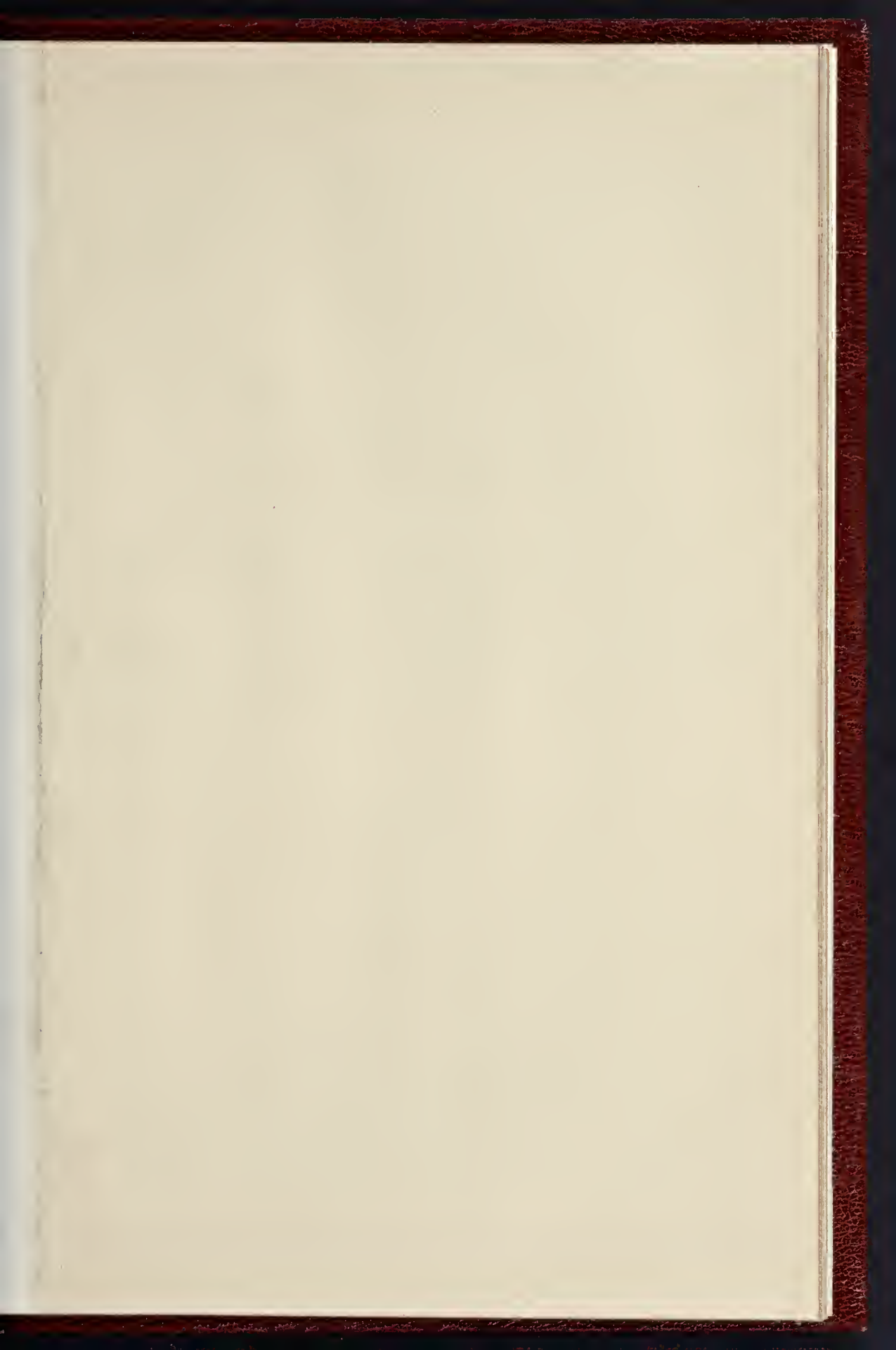
Besides these slow-conductive materials, brick and concrete in various forms and arrangements are also employed. Very considerable use is made by many patentees of porous brick, that is brick which has been made of clay mixed with sawdust which is

consumed in the process of burning the brick, thus rendering it lighter and almost as easily receptive of nails as coke breeze concrete. Hollow bricks either of ordinary brick earth or of the porous manufacture are not uncommon. Dovetailed and keyed bricks or blocks are in bewildering variety, and very considerable spans are shown constructed in this way. Examples of floors of 6 ft. and even 8 ft. span and only 4 in. thick are frequent. In some cases light iron rods or bars, one might almost say laths, for their thickness scarcely exceeds that of hoop iron, are used in the joints of the brickwork to give increased tensile strength to the lower part of the floor's section. An interesting development of this brick construction is seen in self-supported or hanging partition walls, some of which are quite startling, as, for example, the exhibit of Prüss & Koch, of Berlin, who show a structure of two self-supporting parallel walls, 13 ft. span and 18 ft. high, with a cross wall 21 ft. span and 18 ft. high between them, with a doorway cut out in the middle of it. One of the side walls is 2½ in. thick, the other of two thicknesses each 2½ in. thick, with a space between of 6 in. The cross wall is 2½ in. thick. These walls depend largely upon hoop-iron vertical ties; but in another instance, shown by Lorenc, of Berlin, we see walls 12 in. thick and close on 15 ft. span, with a height of 7 ft. 6 in. built of keyed brick alone, without iron. These walls, moreover, carry a brick roof 6 in. thick. Thus the whole structure in this case forms a hut 15 ft. square internally, carried only on four angle piers.

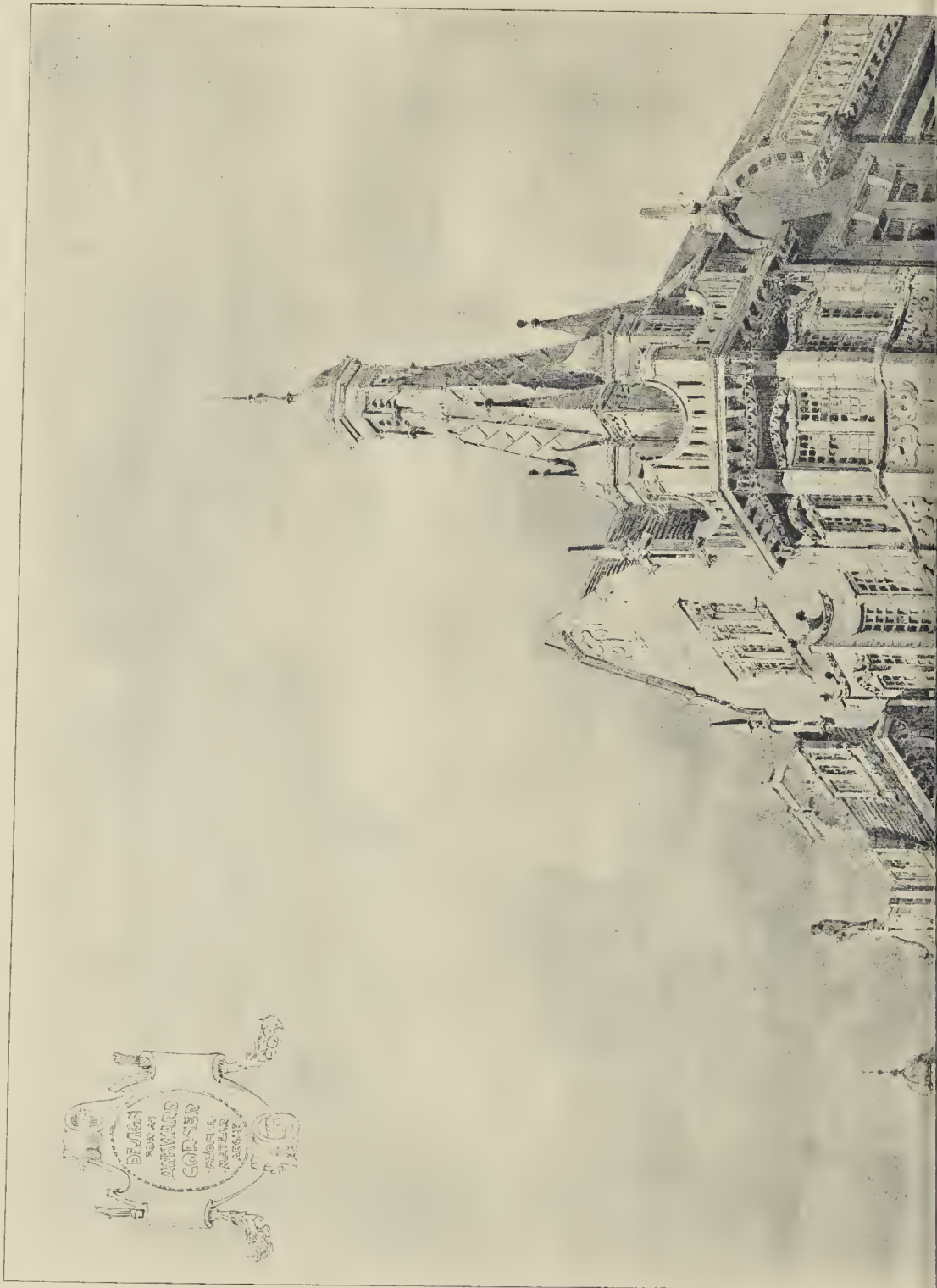
Combinations of iron and concrete are numerous, and in many the construction has but a small amount of iron which is embedded in the lower part of the concrete. As an example of this, we may instance the flooring shown by Paul Zöllner & Co., of concrete 4½ in. thick, 14 ft. span, with ¾ in. iron rods 4½ in. apart. Another example is that by M. Czarnikow & Co., a floor nearly 20 ft. span, of concrete 9 in. thick, with iron bars 1½ in. by ¼ in. 2 in. apart. As a *tour de force* showing what can be done with glass, the Aktien-Gesellschaft für Glasindustrie, of Dresden, have erected a considerable sized pavilion wholly of glass—walls, roof, and floor. Glass bricks, hollow and solid, and wired glass of various thicknesses and patterns are the chief components of this remarkable structure.

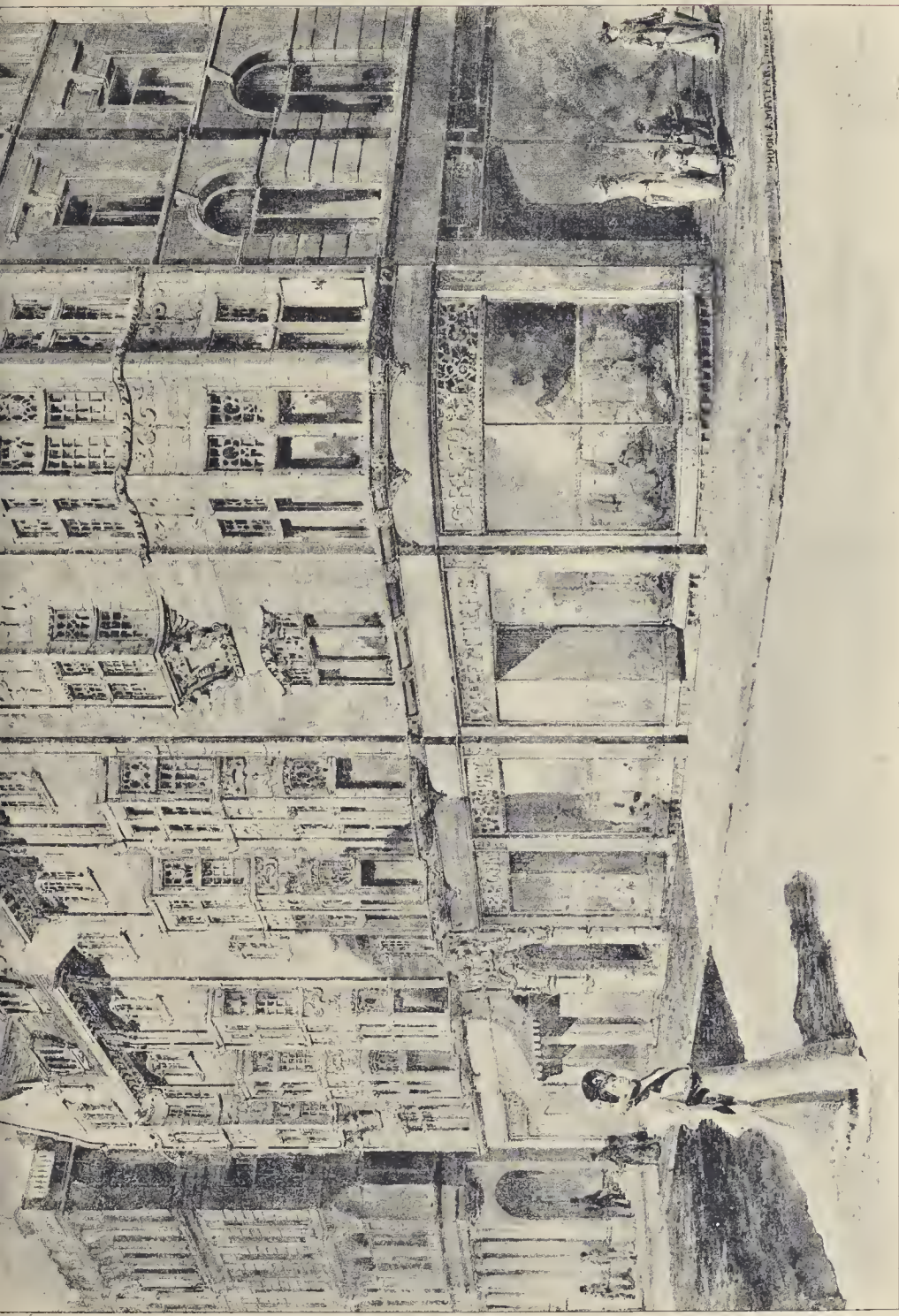
Section 5, "The Well-being of the Personnel of Fire Brigades," comprises but few exhibits, and these chiefly statistics of provisions for sick funds, pensions, and the like, but in the charming exhibit of the City of Vienna are included pictures and sculptures showing incidents in firemen's lives, and there are also examples of gymnasia and baths especially intended for fire-brigade men.

Section 6, "Art, Literature, and Education," affords an opportunity for the German love of statistics, and elaborately compiled tables, plans, and maps are contributed by various official bodies. In this section are also the exhibits of the insurance companies. The "private," or, as we should call them, public companies, numbering forty-five, including our own Commercial Union, Phoenix, Liverpool London and Globe, and the North British and Mercantile, unite in an imposing show, and attract interest by a fine and valuable

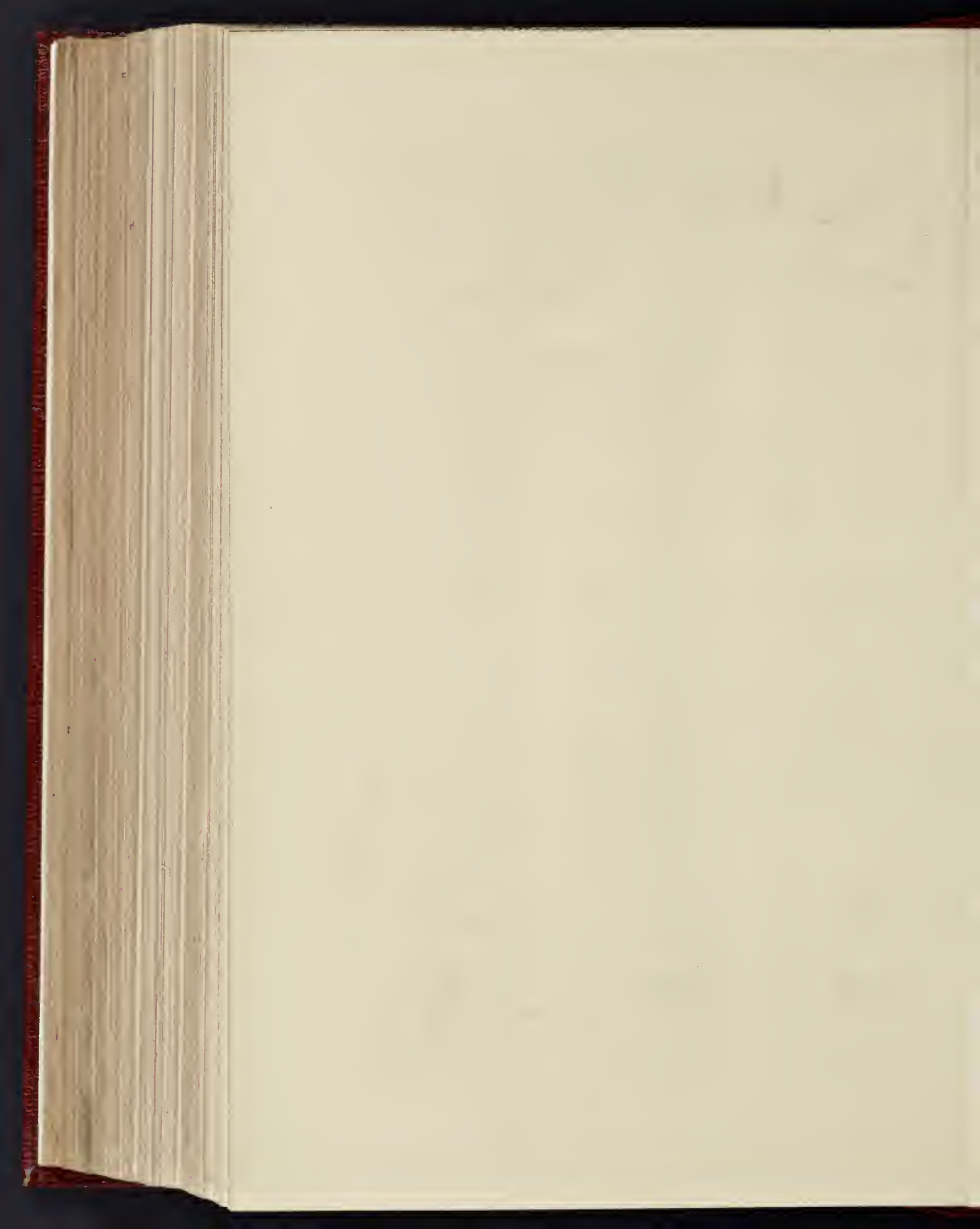


THE BUILDER JUNE 29 1901





10K PHOTO SNAQUE A.C.I.L. 4 5 EAST HARDING STREET, PETER, CAPE, C.



engineers who still insist on specifying specially rolled sections for their designs.

Radio-active Substances.
THE new element "radium," traces of which were first discovered by M. and Mme. Curie

three years ago, is apparently, judging from papers published this month in the *Comptes Rendus* by MM. Becquerel and Curie, by far the most radio-active substance yet discovered. The chloride of radium makes a photographic negative in a few seconds, whilst uranium and its compounds take hours. It also makes a film of platinum-cyanide of barium brilliantly phosphorescent in the dark, even although an opaque substance be interposed between the radium and the film. The effect of Becquerel rays in making air electrically conducting is most strongly exhibited by this element. It has been discovered also that these rays produce most unpleasant physiological effects. It was noticed that those who had to work with these active preparations got sores on their fingers which took months to heal. M. Becquerel placed a radium preparation contained in a celluloid case in his waistcoat pocket for six hours. A sore developed on his skin underneath which took forty days to heal. Mme. Curie performed a similar experiment on herself. She put the preparation in a metallic case and applied it for half an hour, the radiation causing a severe burn which took a fortnight to heal. It was found that when the radium was enclosed in lead no rays came through, but when enclosed in aluminium the rays came through practically without hindrance. By photographing the rays, M. Becquerel has proved that some of them can be deflected by a magnet, but those that are not deflected have the greatest penetrative power. It is probable that substances will be discovered in the immediate future which will have a greater radio-activity than radium, but it will be seen that experimenting on such substances is not unaccompanied with risk to the scientist.

ON and after Monday next the South Metropolitan Gas Company will reduce the standard illuminating power of the gas supplied by them from sixteen to fourteen candles, and concurrently the price will be reduced from 2s. 8d. to 2s. 3d. per 1,000 cubic ft. The Act of 1900 gave this company power to reduce the standard illuminating power to fifteen candles on July 1 next, and to fourteen candles on July 1, 1905, or to make an immediate reduction to fourteen candles on July 1 next on condition that the standard price be simultaneously reduced to 3s. 2d. for fifteen-candle gas or 3s. 1d. for fourteen-candle gas. The company have decided to make an immediate reduction to the fourteen-candle standard, and have given public notice to that effect. It must not be imagined that the reduction of 5d. per 1,000 cubic ft. is wholly due to the reduction in illuminating power. Only 2d. of this reduction is enforced as a condition of the lower standard, and the remaining reduction of 3d. would probably have been made in any case as coal is much less costly now than it was last year. Gas consumers within the South Metropolitan district may be congratulated upon the change to be effected, for the reduction in price is a large one, while the difference in the value of the

lower quality gas for heating, cooking, or lighting will probably not be noticeable to the ordinary consumer. For flat-flame burners the fourteen-candle gas is not so valuable as the sixteen-candle gas, but for incandescent gas lighting the difference between the light efficiency obtained from the two qualities of gas is inappreciable even on the photometer. In accordance with the requirements of the new Act every consumer may have his old burners exchanged for new burners, *free of charge*, upon application to the company. The difference in price between gas supplied north of the Thames and that supplied on the south side will now be even greater than in former years.

The Physic Garden, Chelsea.
IN pursuance of a scheme formulated by the Charity Commissioners for the control and maintenance of this endowment, designs have been made, with the approval of the London County Council, for the erection of a new laboratory-house, a new greenhouse, and other structures at the Physic Garden in Queen's-road, Chelsea. The Apothecaries' Society originally leased the ground, 3½ acres (near the old Swan Tavern in Paradise-row), from Lord Cheyne, for purposes of a summer garden and their barge-house. By an indenture dated February 28, 1721-2, Sir Hans Sloane conveyed it in trust to the Society upon the condition that "it should at all times be continued as a physic garden for the manifestation of the power and wisdom and goodness of God in creation. . . ." Three years ago the Apothecaries' Company sought relief from their trusteeship, finding their resources unequal to the yearly charges of maintenance. They are represented upon the recently constituted governing body for the charitable trust, of whom, being fifteen in all, eight are nominated by the London Parochial Charities' Trustees. In terms of the new scheme, an annual sum not exceeding 800l. for up-keep is appropriated out of the funds of the City Parochial Foundation, and provision is made for the erection of new buildings and for rendering the garden generally available for scientific study of systematical botany and vegetable physiology, together with instruction in technical pharmacology as it concerns the cultivation and uses of medicinal plants. The old greenhouse was built in 1732 by Edward Oakley.

The Royal Caledonian Orphan Asylum.
THE Royal Caledonian Asylum will shortly migrate from London to the site, covering seven acres, which the Governors have acquired at Bushey, in Hertfordshire, where their new buildings are in course of erection after the plans and designs of Mr. W. Emerson. The institution was established in 1813, and two years afterwards was incorporated by Act of Parliament. The asylum was first opened, for about twelve inmates, in Cross-street, Hatton-garden, and was then removed to Copenhagen-fields, and subsequently to the present premises in the Caledonian-road, where 130 children receive maintenance and education. The London County Council have recently purchased the property at Holloway, which stands upon a site of nearly two acres, and has a frontage of 248 ft. to the Caledonian-road, for 16,500l. Under Part III. of the Housing of the Working Classes Act, 1890, the Housing Committee of the London

County Council intend to use the ground for the building thereon of dwellings that will accommodate 1,400 persons of the industrial classes.

The Drainage of Zermatt.

It is satisfactory to be informed that the local authorities at Zermatt have laid down a new arterial system of drainage. It is to be hoped, however, that the individual hotels and pensions will be properly connected with this system, and that the apparatus in these houses will be up to date. There is no use in a local authority establishing a good main system if individual houses are not equally well supplied with sanitary apparatus. Fortunately, the Swiss hotel-keeper has a very high idea of the necessity of good sanitation for his English customers, who are often better supplied in Switzerland than in the hotels in their own country. Yet there are many so-called health resorts in Switzerland where the drainage is by no means satisfactory, not from indifference on the part of the inhabitants, but from the rapidity with which a mountain village is transformed for three months of the year into a resort of persons from all parts of the world. When a place has grown to the size and importance of Zermatt sanitary matters are coped with; but in the intermediate stage between the unknown mountain village and the established fashionable tourist resort travellers have to run a good many risks from imperfect sanitation, from which they would suffer more than they do were it not for the beneficial effects of the mountain air in which most of their time is passed.

FURTHER NOTES AT THE GLASGOW EXHIBITION.

IN going through the British exhibits in applied and industrial art in our last issue, we passed over the important exhibit of the Anaglypta Decorations Company—pardonably, since it is in rather an out-of-the-way corner, and was still in course of setting up at the time our notes were taken. The majority of exhibits of this class are ranged, as already noticed, in what is called the "Grand Avenue"; but the Anaglypta exhibits are at the end of the bridge leading from this to the machinery hall. They occupy two small rooms on each side of the bridge end, and are now we believe completed. They include various designs for wall decorations and friezes, designed by Mr. Geo. C. Haité, Mr. Owen W. Davis, Mr. O. P. Moller, and others; and a ceiling by the last named artist. We have no doubt the exhibit is a good one, and should not be passed over. They have also a frieze in the gallery front of the Ceremonial Hall.

The Women's Section of the Exhibition, in the north-east portion of the main building, includes an Applied Art division containing a very interesting collection of objects, ancient and modern, lent by different owners and artists. There is a small collection of lace, where we can contrast the sumptuous old Spanish point with the feathery delicacy of modern Devonshire lace, beautiful in its way, but weak in comparison with the magnificence of the Spanish work. A piece of old Milanese lace is of considerable interest from a designer's point of view, it is so curiously architectural in character, the design consisting of symmetrical scrolls made of bands about ¼ in. wide, and enclosing decorative leaf forms. Symmetrical design is perhaps, in reality, out of place in lace, but it is interesting to see an exceptional type of work. The north partition of the apartment is lined with a long row of cases of textile embroidery and other textile work, many of them very fine. The cases in the centre of the room contain a considerable variety of articles of ornament designed and mostly executed by women, of which we may notice some of the best. Among these is a silver openwork book-cover by the late Miss Simpson, with nude figures

in the centre compartment and angels at the corners—a charming piece of work. Mrs. Arthur Gaskin exhibits some pretty jewellery in open silverwork and enamel. Among the bookbindings are some worth special notice. The Working Ladies' Guild exhibit a copy of the "Canterbury Poets" with a gold and grey embroidery of Renaissance character on a dark ground. A small book-cover worked in gold thread and embroidered geometrically arranged, by Miss Walker, has a character of its own. In another case a small book with a horizontal gold pattern tooled on a red ground, by Miss Alice Pattinson, merits the same praise. A small volume, "The Little Mermaid," designed and made by Miss Birkenruth, makes its effect with a plain leather centre stamped in relief with a figure, and a margin in which decorative fish seem to play amid a gold tooled diaper. Another noticeable volume is "Ver Lyrae," tooled in gold, with three circles of white vellum inlaid down the centre, on a dark green ground; this is designed by D. S. M'Coll, and made by E. M. M'Coll. Among other objects which have character and originality is a silver rosebowl and stand by G. C. Law Adam; various enamel ornaments by Mrs. Mure; a pearl necklace by Miss E. Newton, with enamel ornaments by Miss Cockerell—a beautiful and delicate design; various silver and enamelled objects by Miss Gertrude Smith, especially a panel with a blue enamel centre representing a night effect (but the lines of Miss Smith's silver work are rather too contorted); and some cloisonné enamel buttons for ladies' wear, by Mrs. Arthur Mure, which are very effective. The collection includes some important pieces of work which have been shown in London at Arts and Crafts exhibitions; Mrs. Walter Crane's embroidery design of The Zodiac among others.

When we come to the Foreign Section, however (occupying the greater part of the floor of the main hall east of the dome), it must be admitted that the French surpass all other exhibitors in the variety, delicacy, and finish of their silver and jewellery work. Of this there is a great deal to be seen, and of course the taste displayed in it is not always of the best, from an English point of view at all events; there is a little too much of the mere "article de Paris"; but the variety of invention shown in this class of work, and the innate faculty of making a thing look pretty and attractive, is remarkably illustrated in the Paris stalls. In the exhibit of M. Sandoz, for instance, which is described as "modern style French novelties," there is a brooch consisting of a little carved ivory head, the gold hair of which goes off into a reversed scroll from the lower curve of which hangs a small pearl; the whole thing is quite ethereal in its fancy and delicacy. M. Sandoz's exhibit as a whole is one of the best—perhaps the best; a flat gold chain with seed pearls at intervals and an oval pendant with a figure in enamel, is another exquisite bit of work and in perfect taste; but the diamond ornaments, in this as in other collections, run far too much in the direction of naturalistic sprays and leaves, as in most English jewellers' work at present, nor are they in this sort of work superior to the English. Messrs. Etlinger frères have a collection of bronzes and other articles of ornament which no doubt have too much of mere *chic*, as the French call it (there is no English word with exactly the same shade of meaning), but they are so very clever; the rather large grey vase, for instance, with spiralled handles and a gold nude figure in relief on it, is quite a kind of inspiration in its way. Mossand's imitation jewellery articles mounted with crystals and Mexican stones, of which there is a profuse exhibit, though it is not exactly what can be called artistic work, is really very pretty, and has a charm which one would not find in the same kind of work in this country. M. Bergeotte's polished iron work and chased and gilt copper work is very good; more classic and reserved in line and style than is at present the fashion either in France or England. He shows a very fine scroll railing designed in clean and precise curves with gilt leafage; some fine door-knockers too, with the figure worked into them; though in these there is the same fault that we so often find in artistic knocker designs, that the portion which knocks does not seem specially designed for that purpose.

There is a good deal of French furniture exhibited also, of various merit, and on the whole not equal to what we can now produce

in England. A good deal of it, like that of MM. Richard frères, consists of imitation Louis Quatorze or Louis Quinze furniture, all very well executed, but not very original. M. Paul Lefebvre shows small plaster relief models of the decorative treatment of the sides of two rooms, one Classic and one Louis XVI.; they show good general treatment, though the models are rather rough—indeed they are described in the catalogue as "sketches" only. Messrs. Depoilly & Fleury's exhibit of what may be called artistic ironmongery is interesting; some of their doorplates and lockplates are very good, and they exhibit also small steel cabinets or coffers of a peculiar type, which have a delicate surface ornament apparently etched on them. Messrs. Charpentier have a large display of furniture; modern work of Louis Seize type mostly, and one or two exceedingly fine reproductions of old work, especially a copy of a grand cabinet at Chantilly, which in point of execution and finish is really equal to the original. Among other French furniture exhibits is that of M. Jansen, excellent work but of rather regulation pattern; that of M. Maxime Clair, a light type of drawing-room furniture in which a considerable use is made of inlay of different coloured woods; and that of MM. Plumet and Selmerheim, who alone (as far as we observed) exhibit furniture exhibiting the new school of design in Paris (borrowed we think from Germany), in which all the lines of the furniture take free and unexpected curves. We do not feel much sympathy with the style, but there is a certain element of originality in it, and, as far as the work exhibited here is concerned, it has the merit of being complete and consistent in style throughout. Among the less important exhibits those of M. Joannot and M. Latouche, side by side, which consist of toilet articles, dressing bags &c., &c., are worth notice for the shapeliness which they give to ordinary articles of use, such as brushes, combs, &c.; things not ornamented, but which derive a certain element of style from merely the trouble taken to shape them well and give a flowing line to them. Messrs. Parison & Cie. have an excellent exhibit of velvets for upholstery, noticeable for a fine style in their patterns and an arrangement making a very good show of colour. M. Sidore Leroy's wall-papers arranged in panels, on the other hand, serve only to show how much behind us the French are at present in this particular branch of applied art; the designs are too spotty in effect and too realistic in detail; there is only one good conventional design, and even that would not count for much among the best of English wall-papers of the present day. Of dress there is a large number of exhibits, which it is not within our scope to comment on in detail; there are some beautiful costumes to be seen, but it is melancholy to find, in one case, the dress exhibited on a beautifully executed wax figure with that horrible thin waist which the French lady of fashion aims at cultivating even more than her English sister, and which is a perfect travesty of the true and healthy form of the figure as made and intended by Nature.

The other foreign countries represented do not contribute much in the way of applied art, and the Colonies still less. In the small section devoted to Austria the firm of Lötz show some good lustre-ware with surface diapers of sinuous lines, and MM. Jacob and Josef Kohn exhibit some bent wood furniture of the well-known type, accompanied however by upholstery of an artistic character. Their room also contains a fireplace of some originality; the opening has an elliptical head and an archivolte round, formed in dark striated tiles; beneath this is a brass front, partly enclosing a hooding of green tiling; there are plain firedogs in white metal: the whole is effective while perfectly simple. The firm of Moritz Hacker have a large show of vessels, figures, and ornaments, in a bright white metal which turns out to be oxidised pewter. It is too bright for the best effect, and moreover destroys that particular tone of surface which, to English artists at least, is one of the special attractions of pewter, and it will hardly be popular in this country.

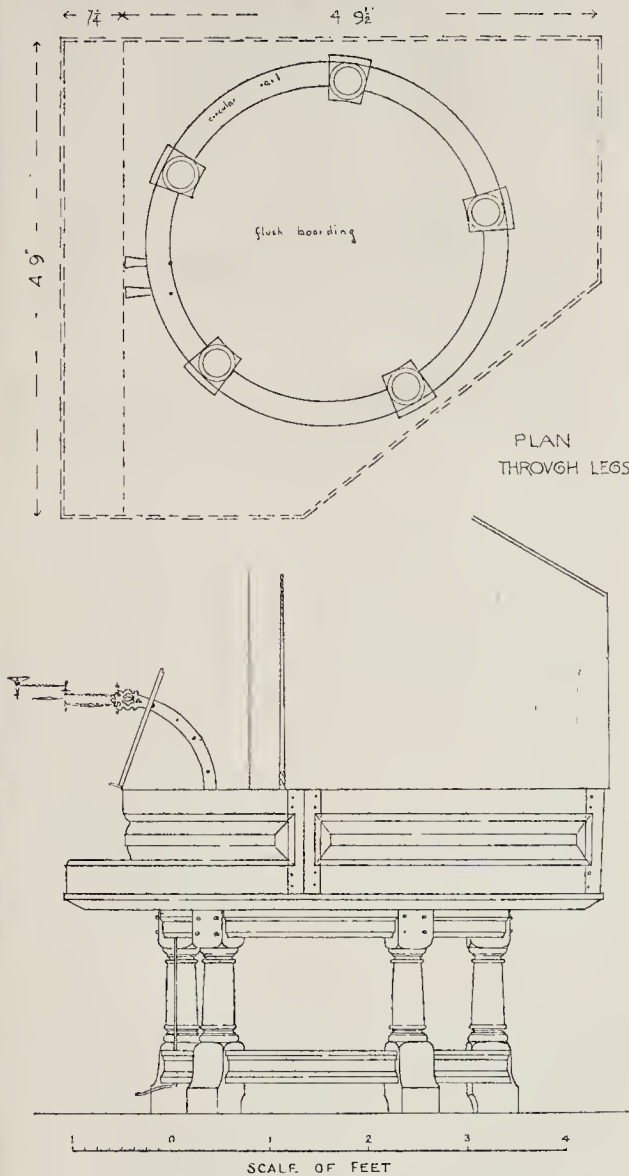
As already observed, there is next to nothing in the way of applied art in the Colonial exhibits, the Colonies and their agents being more occupied in bringing forward the material resources of their countries than in exhibiting artistic work. There is a little furniture in the Canadian exhibit, but of no

particular consequence. In the Western Australia section are some good examples of the practical and at the same time more or less picturesque employment of Jarrah and Karri pine in fencing; and also a large inlaid table showing a design made of a veneer of Jarrah, curly Jarrah, Karri, Banksia, and Sheoak woods; these include a plain red and a mottled red surface, and a light yellowish mottled wood; the workmanship is very good, but the design is not remarkable.

The Indian section, of which the stalls are effectively designed, makes a good show of textiles and silver-work in a style which is now, however, so familiar to us that it hardly calls for comment. The Russian section in the main hall contains some curious and rather barbaric enamelled work of peculiar character—spoons, small bowls, &c., with enamels of very bright colour, and some curious little frames for sacred pictures, with the face in the picture sunk below the level of the ornament; this seems to be a form of popular art. A cloisonné enamel cup, with a gold granular ground, is pretty though gaudy; and Messrs. Sosnowski, of the Jablonna glassworks, have a considerable exhibit of a peculiar glassware, slightly coloured and with a gilt leafage on it—also evidently a popular Russian article, but not interesting except in that sense; it is but a gimcrack kind of work. Of the special pavilions of Russia we shall have something to say separately.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The Association will hold its fifty-eighth annual Congress at Newcastle, from Thursday, July 18, to Wednesday, July 24, with the following Thursday and Friday as "extra days." The President will be Mr. Thomas Hodgkin, D.C.L., F.S.A. On the 18th members of the Congress will assemble at the Council Chamber of the Town Hall at 11 a.m., where they will be received and welcomed by the Mayor. Afterwards the antiquities of the city will be inspected and described. The President's address will be delivered at the evening meeting, at the Natural History Museum. On the 19th members will leave by train for Warwick for inspection of the Castle, Hermitage, Bridge Tower, and Church. The drive will then be continued to Alnwick, where the Castle will be inspected; and a visit will be paid also to the remains of the Præmonstratensian Abbey of Alnwick and of the Carmelite Abbey of Hulne. On the 20th the Congress will visit Jarrah and Monkwearmouth Churches, and Tynemouth Priory. On the 22nd the Congress will visit Chesters (Clurnum) and Housesteads (Borcovicus), two of the stations on the Roman Wall. On the 23rd, Holy Island and the ruins of the later Benedictine Priory. On the 24th a visit will be made to Durham, and in the evening the concluding meeting will be held at 8.30 in the Committee-room of the Museum of the Literary and Philosophical Society. On the 25th those who remain for the extra days will visit Flodden, in the north of the county, under the guidance of the President, Dr. Hodgkin, who will give an account of the battle, and describe the field, of which he has made a special study; Ford and Etal Castles will probably also be visited. On the 26th there will be an excursion to Hexham and Corbridge. Besides the opening and closing meetings, there will be evening meetings at 8.30 on July 19 and 20, for the reading of papers on archaeological subjects. The following papers have already been promised:—"The Inaugural Address," by the President; "Flemish Brasses in England, with special reference to the Brass at All Saints, Newcastle," by Mr. Andrew Oliver; "The Archiepiscopal Mint at York," by the Rev. Caesar Caine; "The Resemblance between the Religious and Magical Ideas of Modern Savage Peoples and those of the Pre-historic Non-Celtic Races of Europe," by the Rev. H. J. Dukinfield Astley; "The President and Council of the North," by Mr. C. H. Compton; "The Galilee as a Place of Sanctuary, with a Suggestion as to the term 'Galilee,'" by the Rev. C. H. Evelyn-White, F.S.A.; "The Boy Bishop," by the Rev. C. H. Evelyn-White, F.S.A.; "Earthworks at Barwick-in-Elmet, Yorks," by the Rev. F. S. Colman; "The History of the Cathedral Statutes," by the Very Rev. Dr. Kitchin, Dean of Durham; and "Canterbury's Ancient Coinage," by Mr. S. W. Kershaw, F.S.A. Detailed information can be



Piano forte in Oak. Designed by Mr. E. L. Lutyens.

obtained from the Hon. Secretaries, Mr. Geo. Patrick, 16, Red Lion-square, London, W.C., and the Rev. H. J. Dukinfield Astley, East Rudham Vicarage, King's Lynn.

DESIGN FOR A PIANOFORTE.

THIS piano is made of oak, put together in rather a solid way, so as to suit a room which I built, and in which it is going.

The case, and the table on which it stands, are made independent of each other. Part of the lid forms the book desk, and is supported by the candle-holders. E. L. LUTYENS.

NEW THEATRE OF VARIETIES, LEICESTER.—A theatre of varieties, which has been erected at Leicester at a cost of about \$0,000, was opened a few days ago. The building is situated in Belgrave Gate on the site of the old Floral Hall, and has been erected from the designs of Mr. Frank Matcham.

LONDON TOPOGRAPHICAL SOCIETY: ANNUAL MEETING.

THE third annual meeting of the London Topographical Society was held in the rooms of the Society of Antiquaries, Burlington House, W., on Monday evening. Mr. Henry B. Wheatley, F.S.A. (Vice-President), occupied the chair, and among those present were Sir Henry Smythe, Messrs. E. A. de M. Rudolf, J. W. Hunt, Rev. W. J. Loftie, Mr. E. J. Barron, Mr. Oswald Barron, Mr. Hilton Price, Mr. Philip Norman, Mr. John Tolhurst, Mr. T. F. Ordish, Major Claude Alexander, Mr. J. C. Webb, and Mr. Jones M. Gomme.

The Council, in their third annual Report, stated:—The outcome of the Society's work in 1900 was the issue of eight sheets of the Kensington Turnpike plan, covering (with the two sheets issued in the previous year) one-third of the whole work, besides the plan of Whitehall presented to the Society by Lord Welby. Good progress has been made with the remaining sections of the Kensington plan, and arrange-

ments have been made for the completion of the work. The Council have expressed to Mr. Griggs their appreciation of the high quality of his reproduction, and in doing so they believe they have interpreted the general feeling of the Society. The accounts have been audited up to Lady-day. Subscriptions amounting to 120*l.* 15*s.* were received in respect of the publications for the year 1900, and in the current year the subscriptions already to hand amount to 100*l.* 16*s.*, making a total of 221*l.* 11*s.*

It was pointed out in the last report of the Council that the strength of the Society is not to be measured by its membership alone. The subscriptions received for back publications continue to be a great support in the new undertakings of the Society. From this source the amount of 50*l.* 10*s.* was placed on the credit side of the Society's banking account in the course of the year 1900, and during the present year a further amount of 44*l.* 16*s.* has come in, making a total of 104*l.* 6*s.* for back publications, as compared with 221*l.* 11*s.* for current subscriptions received during the same period. The greater part of the Society's income for this and the coming year must inevitably be absorbed by the reproduction of the Kensington Turnpike plan, but when in due course this work takes its place among the back publications there will be a remunerative return on the outlay; it will become a source of revenue in aid of future undertakings. It was this consideration that emboldened the Council to put the whole work in hand for completion, although this step involved the postponement of the letterpress issues. These, however, cannot be longer deferred, and it is hoped that the first part of the Society's "Record" will be issued in the autumn.

Our difficulty is to make our objects known and obtain sufficient members to enable the Society to cope with it. There are maps and views awaiting reproduction which are as interesting and instructive as any that we have published. To name only those that stand next in order for consideration there is the picture of London in the beginning of the eighteenth century—"A Prospect of the City of London and Westminster and St. James's Park," by John Kip, 1710. There is the large map by Ralph Aggas, showing London as it was in the reign of Queen Elizabeth, the earliest known map of London as a whole, a really satisfactory reproduction of which is much needed as a companion to our view by Van den Wyngaerde of the same period. Then there are the pictorial representations by Hollar of a later date than the views of Van den Wyngaerde and Visscher, which members of the Society already possess. Concerning these views by Hollar, an interesting discovery was recently made by that excellent topographer, Mr. Lethaby, a member of our Society. He found that when placed in juxtaposition the two views of Hollar form one complete panoramic picture of the whole of London in the time of Charles I. As soon as possible—that is to say, as soon as we have sufficient members—both these views will be reproduced and copies will be in the hands of the members, and they will be able to see for themselves how much Mr. Lethaby's observation has enhanced the interest of these beautiful pictures. . . .

One of the principal objects for which the Society was started was to make a record, more complete than could otherwise be accomplished, of all those changes which are so constantly and so rapidly taking place in the topography of London. We make no proposition for the preservation of buildings, although we rejoice at every public-spirited effort made in this direction. Our concern is only to make and publish a yearly record of the demolitions and changes, and of the alteration of street names. In the case of the more interesting houses and buildings our desire is to have accurate drawings made, as in the three parts of the "Illustrated Topographical Record" already published. It is felt by the Council—and no doubt it will be felt by the Society generally—that in this work we have a claim to the good will and assistance of the public bodies of London and their official representatives. There is probably no ward in the City, no borough within the county of London, which is destitute of people who take an intelligent interest in the history of their locality. What is wanted is that the Society should get into communication with such people, many of whom would doubtless be found on or connected with the local governing

bodies, and show them how, by the simple process of sending in to the hon. secretary of this Society timely and reliable information concerning impending demolitions and changes, they can contribute to a yearly record which, by such a system of co-operation, would cover the whole of London. The Council are convinced that in every district there are those whose culture and position will cause them to feel themselves morally bound to assist in this disinterested work, which will preserve as history so much that must inevitably disappear from the ground of London."

The Chairman, in moving the adoption of the report, said that the report was to some extent satisfactory, because it showed that much had been done, but it was disappointing to feel that the subscription list was not so large as it should be. The Council felt that much could be done if the number of subscriptions increased, and that they had hitherto been hampered. There was no doubt that the popular interest in London was increasing. It was to be seen on all sides, and it was hoped that it would take the practical form of helping societies and individuals to increase their knowledge of the history of this great city. This Society should be at the head of the movement. It did not interfere with the work of other societies. It was, to a great extent, a registering society, and therefore it could help to bring together the work done by other societies and individuals. It was found that in these times so much was done by individuals and societies which did not come to the knowledge of those who wished for the information. It was so important to have some centre where persons could find all information they required on the subject. With regard to the constant demolitions and changes which were taking place in London, they could not but feel that a great number of them were inevitable. He thought that perhaps too much complaint was made about demolitions which were inevitable, and it would be better to use their resources to prevent what could be prevented rather than to try to prevent the inevitable. Of course, one very great difficulty in respect to the changes in London resolved itself in the point that property was so valuable. For instance, there was the old South Sea House in Threadneedle-street—an interesting building and associated with Charles Lamb, who for so many years acted as clerk there. They all regretted that this structure should be pulled down and rebuilt, but what could they do? When the South Sea House was purchased in 1856 by the Baltic Exchange, the price was 55,700*l.*, and it was sold last year for 350,800*l.*! What could be done when this amount was given for a building? The matter was, indeed, hopeless. It was said that about 4*l.* per superficial foot was paid—the highest amount which had ever been given for land, even in the City of London. Christ's Hospital was another building which they felt most grieved should be destroyed. The building was most interesting, and took us back to the Grey Friars. But while the associations of the place were full of the deepest interest to all, he had heard some say with regard to the building itself, "It is nothing; the hall was built in 1825, in the Gothic of that time. There is nothing to regret about its loss." He, however, did not agree with these people, because the building was very effective. When one looked through the grating and saw the boys playing, and the buildings behind, one felt that it was a place of very great interest. Not only was there a façade by Wren, which was as fine a piece of building as any in London, but there were some old parts which were not generally seen, and which were full of interest. Of course, they had always known that the time would come when the building would have to go, but surely it was a matter of sufficient interest for Parliament to consider as to its treatment. He hoped that some strong feeling would be shown in order that we might have some portion of it left, or at all events that it should not be cleared away and warehouses put in its place. It was difficult to say what could be done, but surely all those who felt an interest in London and in the history of England—for really it took that position—should do something to see that the treatment it received should be the very best that was possible. There were many things they could prevent, and fortunately many would be demolitions had been prevented, such, for instance, as the proposed demolition of the churches of St. Mary-le-Strand, St. Clement, and the

church at Bow. It did seem a most monstrous thing now that any one could have thought of destroying these buildings, because they were in a decidedly advantageous position, dividing the traffic, and the view looking down the Strand toward St. Mary-le-Strand formed a most charming picture. Whether there would be a stop to the wanton destruction of other City churches he did not know, but he hoped we should not altogether lose those beautiful views of Wren's steeples that gave character and charm to the City of London. It seemed a great pity that so many had already been lost, and even if the superstructure was obliged to go, the crypts and underground work might have been allowed to remain. With regard to the skyline of buildings, they could not very well deal with private property, but Parliament might do something to prevent the spoiling of a building by raising the height of another. In all parts of London handsome buildings were spoiled by the erection of neighbouring structures which were greater in height. That was very much to be regretted. Looking from Charing Cross Bridge towards St. Paul's, one saw the Joint Examination Hall first, which he thought was built too low; then the Savoy Hotel, very much higher; and then the Hotel Cecil, higher still. Of course, however, a certain amount of variety in the sky-line was a great advantage, and added to the picturesqueness of many of our cities. It was very much wanted in Paris, especially in the Rue de Rivoli, but still there should be some regulation. It seemed a practical suggestion that an Act should be passed dealing with the matter, and there was a precedent, because after the Fire of London an Act was passed dealing with the erection of streets of first, second, and third class, the houses in which were to be of a certain height. Something of the kind should be done now, and it was certainly necessary that the height of the houses should be relative to the width of the road. They must feel that, in spite of all the demolitions, London was very much improved in beauty. There were some fine effects in London, and better could not be found in any other great city. The making of the Embankment was one great improvement, because London owed its chief beauty to the river; and another beautiful view was from Oxford-circus looking down Oxford-street. With regard to the future of this Society, the question of the registration of the changes in London was of great importance. The changes were so many and so great that it was impossible for them to be properly registered without some arrangement being made with the various authorities, and the Council of the Society felt that they would be able to do this if there was an increase in the subscription list. Another task which was of great interest to the public, and which the Council would like to take in hand, was to make a record of the large number of manuscripts, &c., connected with the history of London which were to be found in the British Museum, the Record Office, and other places, many of which were not made use of at all. This would be a great work and would be deeply appreciated.

Mr. Jackson Barron, who seconded the motion for the adoption of the report, remarked that the members had during the year had an exceedingly good return for their subscriptions. He cordially endorsed the chairman's views as to the necessity for guarding historical buildings, and said he desired to refer particularly to the buildings on the west side of Lincoln's Inn Fields, which he understood were threatened by the London County Council. The space was not required for a new street, but merely for recoupment purposes. He presumed the County Council would want to build up some monstrosities of which they in London already had too many. He hoped every one who might have influence with the County Council would endeavour to save the west side of Lincoln's Inn Fields, even for the sake of the three or four particularly interesting houses there.

Mr. J. Wickstead, of Canada, said that as a visitor to this country he had derived pleasure and profit in hearing the chairman's outspoken remarks. He was anxious to get photographs of interesting and ancient buildings, and he recently was much amazed to find how few authenticated photographs of interesting old dwellings existed. He mentioned the old Hanover Club as an instance.

Mr. Oswald Barron, in supporting the motion for adoption, thought the Society should prepare a schedule of historical build-

ings, which should be regarded as the irreducible minimum, and be defended against all attacks. They ought, in other words, to find out London's bulwarks in this respect, and say, "These cannot be touched." There was Staple Inn, for instance. He hoped the time would never arrive when the dismal performance of demolishing this quarter would be gone through. Its disappearance would surely be a pathetic thing; it was an interesting example of 1600 architecture. Sooner or later, no doubt, it would be assaulted, and he thought a society such as this should be on its guard against it, rather than to attempt to shut the stable-door when the horse had gone. He was glad that Lincoln's Inn's gateway had been saved, though he doubted the wisdom of placing it in the custody of a learned society. If the practice of scheduling suggested had been introduced before this, they would probably have saved one, at least, of the perfect specimens of wooden galleried inns which were the precursors of theatres in London. They might have saved one of these a few years ago in Austinfriars—a place unique in its associations with Dutch merchants of the past. As to compiling records, he pointed out that here was a plan whereby they could produce a Kelly's Directory applying to the Restoration period. When the hearth tax was imposed, records were taken from alley to alley and street to street in an amazing manner, and these returns were still preserved at the Record Office. This, he thought, would be a very worthy object for the record department of the society to interest itself in.

The Chairman remarked that as a member of the Council he would bring the suggestion forward, and he was sure it would receive every consideration.

The motion for the adoption of the report was put and carried.

The hon. treasurer's balance-sheet having, on the motion of Mr. Tolhurst seconded by Mr. P. Norman, been approved, the Council was elected, among those chosen to fill the seats being Lord Belhaven and Stenton, Viscount Dillon (President of the Society of Antiquaries), Sir John Taylor, Messrs. C. Lawrence Gomme, Alexander Graham, A. Harben, W. J. Hardy, W. R. Lethaby, P. Norman, T. F. Ordish, F. G. Hilton Price, J. E. Smith, J. Tolhurst, and Warwick Wroth.

Mr. J. F. Gomme was re-elected hon. treasurer, and Mr. Bernard Gomme hon. secretary.

Votes of thanks were accorded to the retiring members of the Council, to the Chairman for presiding, and to the Society of Antiquaries for the loan of their room for the meeting.

ROYAL ARCHITECTURAL MUSEUM AND WESTMINSTER SCHOOL OF ART:

ANNUAL MEETING.

The annual general meeting of this institution was held at the Museum, Tufton-street, Westminster, on Friday the 21st inst. The chair was occupied by Mr. W. Emerson, the President of the Royal Institute of British Architects, and he was supported by Messrs. J. P. Seddon, Forster Hayward, Maurice B. Adams, William Pain, and others.

The first business was the election of president, and Mr. J. P. Seddon, in moving that Mr. Emerson be re-elected to the position, said it was preferable that they should have at their head a professional gentleman, and of all professional gentlemen he regarded Mr. Emerson as most worthy of their support.

The motion, which was seconded by Mr. W. Lee, was adopted unanimously.

The Chairman said he was very much obliged for the honour they had done him. He should very much like to see the Museum and School in a more flourishing condition. They were now, so to speak, in a state of transition, and he was confident that later their hopes for a more flourishing state of things would be realised.

Mr. Adams then read the report of the Council. In it the Council gave expression to their participation in the world-wide sorrow occasioned by the death of Queen Victoria, who had been patron of the institution since 1860. An address of condolence was sent to his Majesty the King, who had since graciously consented to become patron. The Council also recorded with regret the death, since the last anniversary, of the Marquess of Bute, one

of the vice-presidents, and of Mr. Arthur Cates, who for some years acted as one of the auditors, and always took considerable interest in the welfare of the Museum. Through the good offices of the newly-elected President, Mr. Wm. Emerson, the Council had the satisfaction of stating that a closer connexion had been brought about between the Museum and the Institute of Architects, and the Institute had kindly promised an annual donation of 20s. to the funds, on condition that the Institute shall be adequately represented on the Council, and that members of the Institute and of the Architectural Association be permitted to sketch from the examples in the Museum without payment of a fee, during the hours when it is open to the public. The finances of the institution were in a satisfactory state, but a heavy and immediate outlay was in contemplation, the Council having resolved to renew the roofs of the older portions of the buildings, which had of late been a constant source of expenditure for repairs, and to replace the present glass by patent glazing. Tenders had been obtained for this important and necessary work, which would involve an outlay of something like 700l. The Council hoped that not only the old friends of the Museum, but the profession generally, would make individual efforts to assist in meeting this exceptional expenditure, and subscriptions would be gladly received by the Hon. Treasurer or Hon. Secretary.

The Westminster School of Art (added the Council) well maintained its high reputation, and gained a constant accession of new students through the recommendation of artists of repute and others who had become personally familiar with its work. In the evening classes (with the exception of the men's life class) there had been a gradual falling-off, which was attributed mainly to the increase in the number of art classes opened in London of late years at nominal fees, or even without any payment whatever.

There was, Mr. Adams remarked, an entirely mistaken idea prevalent among persons who should be better informed as to the intrinsic value of the casts at the Museum. He would like to point out that by far the greater number were unique, and could not be obtained again. They were secured under very difficult circumstances when cathedrals and churches were being restored. In many instances scaffolding had to be erected to obtain access to the originals. So much as to their value, from an artistic standpoint. As to their money value, he believed that if they were put up for sale they would realise an enormous sum, as they would, in all probability, be sought for by German and American institutions and universities and colleges abroad, where the public had a far keener appreciation of art than in this country. In keeping the collection together, therefore, the Museum was doing the country a very good turn. At the present moment, as was well known, the taste in architecture had not turned towards the mediæval style, but he was convinced that before long the taste would revert to that style, even though it did not go to the extent of what might be called a Gothic revival. During the past few months a number of books had been published dealing with Gothic architecture. One issued that week dealt with the Gothic crypt of Glasgow Cathedral. There must be some people sufficiently confident that the taste had not gone away from mediæval work, or they would not have embarked upon so expensive a task as producing a book of that character. As to the Museum not being in a flourishing state, he would remind them that the institution had never been what might be called popular. Nevertheless, the institution, if not popular, was highly practical, and had done excellent work in the past in affording students a knowledge for which surely they could never cease to be thankful. He concluded by moving the adoption of the report.

Mr. W. Pain seconded. The Chairman remarked that the balance in hand was smaller than last year, but against that they must set the fact that they had been to a considerable expense in repairs. One of the classes was certainly not remunerative, but seeing the enormous competition to which the School was in that particular phase of art subjected, he could hardly wonder. As to the Museum not being popular, he certainly had noticed a feeling that there should be a larger assortment of specimens dealing not only with Gothic, but with Renaissance architecture.

The Royal Institute of British Architects would, no doubt, be inclined to give a donation if the Council could find means to rearrange the casts and provide some other styles of architecture. This was a matter of considerable importance to students who required to study closely the details of all sorts of work. He thought they ought to interest their friends in the attainment of this end. He would give 20 gs. towards this object if others would take up the endeavour. When the roof had been repaired and all necessary alterations completed the casts might be rehung and the place made to look very much more "taking." Moreover, the balance-sheet next year would be more favourable because this year they had had to pay the last amount due to the London County Council.

The motion for the adoption of the report was then carried.

On the motion of the chairman, the following were re-elected vice-presidents:—The Dukes of Norfolk and Rutland, the Marquis of Ripon, Earl Fortescue, the Earl of Wemyss and March, Lord Grimthorpe, Messrs. Aston Webb, John Belcher, G. F. Bodley, Geo. Frampton, and J. P. Seddon.

The following were, on the motion of Mr. Adams seconded by Mr. Seddon, also elected:—Vice-presidents: Messrs. J. P. Seddon and Aston Webb; members of council: Messrs. C. Forster Hayward, Sydney W. Lee, William Pain, L. H. Hayer, W. R. Lethaby, Lieut. Colonel Ford, and Mr. Leon, the latter four representing the London County Council; and Messrs. W. M. Fawcett, W. H. Seth-Smith, and T. H. Watson, representatives of the Royal Institute of British Architects. The hon. treasurer'ship was again taken by Mr. E. L. Somers Cocks; Messrs. W. M. Pain and P. D. Leake were reappointed auditors.

A vote of thanks to the chairman for presiding concluded the meeting. Mr. Seddon intimated his willingness to contribute ten guineas to the fund started by the president.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

The annual meeting of the Incorporated Association of Municipal and County Engineers was opened in the Council Chamber of the Town Hall, Leicester, on Thursday, June 27, the new President (Mr. E. G. Mawbey, C.E.) presiding, and there was a large attendance of members of the Association from all parts of the country.

A hearty vote of thanks was accorded to Mr. C. H. Lowe, of Hampstead, the retiring President, for his services to the Association during the past year.

President's Address.

The President then delivered his address. After some preliminary remarks, he said that few, if any, towns had shown more enterprise and public spirit, or had made greater progress, than Leicester in recent years. The population twelve years ago, in 1889, was 138,000. In 1891, when their Borough Extension Scheme was promoted and won, it was 174,624. At this 1901 census it had risen to 211,574—an increase of 21.16 per cent. in the decade. The rateable value in 1889 was 522,307l.; in 1891, after the extension, 649,583l.; and it was now 841,307l.—an increase of 29.51 per cent. in the decade. In the twelve years 4½ miles of new streets had been made and sewered on the duplicate system, bringing the total length of streets and roads up to 178 miles, against seventy-six miles before the extension of the borough. Plans had been approved since 1889 for 15,535 dwelling houses, 167 warehouses, 179 factories, 313 workshops, 314 special buildings, 10,968 miscellaneous alterations and additions, new drains, &c., and for 386 new streets, the whole covering over 500 acres of additional built area and involving an expenditure of about 7,000,000l. sterling, which speaks with a peculiar eloquence of the progressive commercial prosperity of the town. During this period Local Government Board inquiries had been held upon 226 subjects for new works and improvements involving the expenditure of about one and a quarter millions sterling, and he had, at the present time, schemes in hand representing a cost of nearly a million sterling, for most of which the loans had not yet been obtained, and the routine expenditure by the various committees in matters affecting his office amounted to about 80,000l. per annum.

Regarding their everyday work, he could not speak too strongly on the great necessity, as one of the best practicable means of safeguarding the health of the community, for Local Authorities being liberal in providing an adequate number of well-qualified and properly remunerated Building and Sanitary Inspectors, working under able administration.

The good effect of the great sanitary works and efforts of this Corporation was vividly shown by the steady and maintained diminution of the death rate. The average from all causes during the decade of 1861-71 was 25.95, 1871-81 24.47, 1881-91 19.38, and during the last decade to 1901 only 17.54. With regard to the designing of the various classes of public buildings, in some towns a separate architectural department had been organised. In Leicester the ordinary architectural work was done by his staff, and the most important public buildings by architects in private practice. Nevertheless, in connexion with all these an immense amount of preliminary work necessarily falls upon the Borough Engineer in advising and assisting various committees, preparing preliminary plans and estimates with detailed conditions for competitors, and outlining the schemes before the work reaches the architects. This was, however, he thought, a far preferable plan than to set up an architectural department outside the control of the Borough Engineer, and much more fair to the architectural profession.

Referring, in passing, to other departments, the town owned the gas, electric light, and water undertakings, and Parliamentary powers had been just recently obtained jointly with Derby, Nottingham, and Sheffield for carrying out the great Derwent Water scheme. Since 1889, 120 miles of public and private foul and storm water sewers had been laid in the Borough. Mr. Gordon's intercepting sewerage scheme and pumping station had been carried out at a cost of about 163,000l. and had proved very successful; and his storm outfall scheme, which many of them saw in progress and which had cost about 80,000l. had also been completed. It was, however, one regretted to say, not unusual for municipalities, after having provided ample intercepting sewers, to leave in use in old and densely populated parts of the towns defective and dangerous sewers of the worst type, such as used to be designed and laid before the days of the Association.

Several years ago he drew attention to the existence of many miles of defective sewers in Leicester and the probable ill-effect of them upon the inhabitants living in those districts. He was promptly instructed to examine and report upon them, with the result that he condemned thirty-two miles and was now carrying out a scheme to replace them, which he had designed and which was estimated to cost 128,000l. Although they had not yet arrived at a unanimity of opinion, on the question of sewer ventilation, the chief trend of practice had been in the direction of the abolition or reduction in number of surface grids and the increase of shaft ventilation. In Leicester he carried out tests during a period of between five and six years and made over 3,000 observations of the velocities obtained in the shafts, besides very numerous records of temperature, humidity, wind velocity, barometrical pressure, and the like. These practical experiments convinced him that sewers could be efficiently ventilated by pipe shafts alone in conjunction with very ample means of flushing. After the results of these experiments had been submitted at an inquiry, the Local Government Board passed the first section, namely, of eight miles of the tributary sewerage scheme, with ventilation provided by shafts, without any surface grids whatever—a new departure in the requirements of the Board. No surface grids were now provided on any new public or private sewers laid down in Leicester. The purification of sewage was one of the greatest and most perplexing questions that had confronted municipal engineers.

The investigations of the present Royal Commission on Sewage Disposal had already been very extensive, and would doubtless prove the most exhaustive and valuable research on record. Some thought that the Local Government Board might now relax their requirements, and pass schemes for bacterial treatment alone. This was not surprising, having regard to the success which had been obtained by bacterial methods. He had, however, maintained that until sufficient experience

had been gained to prove that the sewage of the manufacturing towns could be successfully and permanently purified without application to land, the Board were justified, in the main, in adhering to their present attitude, for land was an immense safeguard in connexion with any sewage scheme. Still, in cases where it was almost impossible, except at a prohibitive cost, to obtain it, he believed that the requirements of the Board might reasonably be modified. In fact, leniency had already been shown in special cases, and they might probably expect greater facilities when the eagerly-awaited Report of the Royal Commission had been issued.

Some of the main questions at issue were—(a) whether the sewage of manufacturing towns and districts could be successfully treated with maintained efficiency without application to land; (b) whether it was better to adopt the fullest anaerobic preliminary treatment in covered septic tanks with final purification in contact beds, or whether only to employ a partial anaerobic treatment in open or closed tanks with a maximum aerobic purification in contact beds; (c) further, whether preliminary chemical treatment might not also be necessary in some instances where strong trade liquids obtain. The question of intermittent or continuous treatment in the contact beds was also a debatable point, but the extreme aspect was whether, even where suitable land was available, it would not, if admissible, be more desirable to adopt bacterial treatment entirely than a combination of it and land treatment. Again, what was to-day the best course to adopt where existing sewage farms, for want of sufficient area, means of preliminary clarification, or other causes, yield more or less unsatisfactory effluents?

The local conditions and the character of the sewage varied so considerably in different towns and districts that it was obviously impossible to determine upon any one system which would be universally applicable. These questions could, however, be more reliably dealt with by giving them facts as to how they had successfully solved the problem for Leicester than by mere expression of opinion. Twelve years ago, when he came there, and up to 1891, the River Soar in summer-time was a black stream of horribly offensive sewage matter, which, in that highly putrefactive condition, reached miles down the river, although everything was done, at unlimited cost, in chemical treatment at the old works. In consequence of the difficulty of obtaining porous land in sufficient quantity, and suitable locality, his predecessor had, much against his will and advice, to fall in with the adoption of their present exceedingly dense clay farm at Beaumont Leys, which it was widely prophesied would result in failure. The first contract, amounting to 10,400l., for receiving tanks, carriers, culverts, &c., for part of the farm was well in hand when he succeeded Mr. Gordon. The total cost of laying-out had been 59,025l., or about 43.50l. per acre, for the 1,355 acres actually prepared for receiving sewage.

The great problem then before them was how to so lay out, prepare, and under-drain the land for broad irrigation as to ensure efficient purification and to prevent the foul effluent, which always reached the drains of a clay sewage-farm, from getting away to the watercourses. This they succeeded in doing by providing for each field a separate system of drainage, so designed that the foul drain effluent could be brought on to the surface of the sloping land and treated over and over again until fit to send away. This, with other arrangements, together with the services of an exemplary committee and efficient farm bailiff resulted in their dense sewage being purified for over nine years to the satisfaction of the Leicestershire County Council.

The increase of the population and the trade had been very great, and these factors, together with the conversion of 6,700 pail-closets into water-closets and the proposal to pump the sewage from the 12,000 population of the added area of Belgrave, rendered it necessary to either increase the area of the farm or to adopt some means of preliminary clarification.

He had been allowed to carry out very extensive bacteriological experiments. Altogether seventeen different processes were tried, with two chief objects in view. 1. The preliminary clarification of the sewage before application to old pasture land and rye-grass for final purification, without fouling the crops. 2.

Complete bacterial purification without application to land. For preliminary clarification, the system found most successful and suited to their requirements was to pass the screened and pumped sewage through a detritus tank of comparatively large capacity, then through a coarse-grained first contact bacteria-bed on the intermittent system, the effluent therefrom being finished on grass. By this process eminently satisfactory effluents were uniformly obtained, notwithstanding the heavy nature of the land, and much less than half the land was required to be used than when crude sewage was applied. The final purification on the old pasture was at once a most reliable and effective process and entirely free from offensive smell. The process for complete bacterial treatment which gave the best results was the passing of the screened and pumped sewage through the detritus tank as before, then through treble contact beds, and the effluents from this process were only just equal to those obtained from the detritus tank, single contact, and irrigation on grass land. The detritus tank and double contact process was not quite equal to either.

These results were only determined by very numerous and exhaustive observations and analyses. He consequently advised the Corporation to purchase 1,270 acres of the land now leased to them, in addition to the 100 acres of freehold they already possessed, and prepared a bacterial clarification scheme to assist the land, consisting of open detritus tanks with a capacity equal to one-sixth of the present eight million gallons dry-weather flow to be dealt with, and 12 acres of first contact bacteria-beds, which, together with the effluent pumping plant, new sewerage, and pumping station for the added area of Belgrave, was estimated to cost 168,000l. This scheme had been unanimously adopted, and application had been made to the Local Government Board for sanction to borrow this amount.

Great inconvenience had been experienced throughout the country for want of a general Act of Parliament giving Local Authorities greater facilities for improving small rivers, brooks, and ordinary watercourses in their districts, particularly where improvement works necessary for the prevention of flooding of lands and dwellings were too small to justify the obtaining of a local Act of Parliament, and too great to be defrayed out of the Revenue Account.

The flood which occurred at Leicester on the last day of the nineteenth century was the greatest there within living memory. Their great floods prevention works, which were mostly designed and carried out by Mr. Gordon and Mr. Griffith, and brought to a completion by himself, at a cost of about 352,000l., were constructed to carry off a volume equal to the whole of a rainfall of 1½ in. in twenty-four hours from the 147 square miles of drainage area, and the volume of the flow which was actually discharged and also successfully carried off during that flood was equal to a rate of rainfall of nearly 1½ in. in twenty-four hours. This was valuable and useful data in connexion with the preparing of floods prevention works.

The rapid growth of large towns demanded, for the sake of the health and vigour of all classes of workers with muscle or brain, for the children, and for those to whom they were so indebted for home comforts, that ample open spaces and conveniently located parks and recreation-grounds be provided. In Leicester they had now 410 acres of parks, recreation-grounds, and children's playgrounds, altogether twelve in number, including their beautiful Abbey Park, which was opened in May, 1882, by our present King and his beloved Consort, and which had proved a great boon to the people. Including the above, and the 1,270 acres of land of the Beaumont Leys Sewage Farm now being purchased by arbitration, and the different estates, the Corporation would own altogether no less than 2,442 acres of land and properties for various purposes, exclusive of gas and water; and so convinced were they of the advantages which would accrue, both in health and financially, with more power to acquire surrounding land, which was ever increasing in value, that they were far from satisfied with the facilities present legislation afforded.

They had now three public baths and two open-air bathing stations, and were about to build another set, involving altogether an expenditure of about 50,000l., exclusive of land.

In electric traction for streets and roads there

was now opened out an immense field and future for municipal engineers. In conjunction with electrical engineers they had already played a very prominent part in the designing and carrying out of schemes in the large towns. There had been much greater enterprise and progress abroad than in this country, both in manufacture and construction, and from which they had derived much advantage; but all this was being rapidly changed, and to-day they possessed, in some of their cities and towns, overhead trolley systems, power stations, depôts, and various accessories of the very best types, with approximately about a thousand miles of electrically equipped tramway track now in operation, mostly put down within the last decade, and several hundred miles under construction. But perhaps nearly twenty times as much as this had been electrically equipped in the United States, and a vast aggregate mileage throughout the Continent. It was high time we moved. Foreign companies and capitalists were not only reaping the benefit of our traction trade, but were exploiting this country for the purpose of financing and carrying out tramway undertakings which our countrymen, who in the past had been great pioneers in railways and other engineering works, ought, for the honour and prosperity of the Kingdom, to rouse up and do for themselves, while, at the same time, encouraging and fostering such interchange of trade with other countries as was mutually advantageous.

Leicester, although usually in the front, was at present behind in electric traction, chiefly because the tramways were still in the hands of a company, but it was intended to come into line at least very soon. Although the overhead system had been chosen by every provincial town in the United Kingdom which had hitherto carried out a scheme, the objections to it had been so deeply rooted, that a most exhaustive investigation had been made by them in the hope of finding something better, but they found nothing, except the overhead trolley, which sufficiently combined reliability, safety, economy, and efficiency for a town like Leicester. They therefore recommended it, and also a separate and independent central power station. No detailed estimate had yet been prepared, but the present scheme embraced twenty-two miles of route and about thirty-eight miles of track, and as to cost, half a million sterling was a guess which went unchallenged, without including the purchase amount of the present undertaking.

He felt convinced that in provincial towns much more would be done to solve the question of the housing of the working classes by electric tramways than by the erection of blocks of workmen's dwellings in thickly-populated centres. Small separate dwellings on the extreme outlying parts of a town conducted greatly to the improved physique and respectability of the people, especially when allotment grounds were available within easy reach. They found that the experience in Brussels had been that it was not necessary to wait for the growth of a suburb before making a tramway, but that when a tramway was put down it made a suburb, and that, as unhealthy houses had been demolished in the centre of the city, the working classes gladly availed themselves of the cheap and rapid tramway transit, and went out to the healthy dwellings which were soon provided, at reasonable rents, by private enterprise.

There was undoubtedly a great future for the auto-car for light work and swift and convenient transit, and as greater perfection with regard to fuel, engines, gearing, and reduction of noise was attained, it would gradually effect a great sanitary improvement, and would considerably diminish the wear and tear of their roads and streets in comparison with horse traffic. Smart men would be their own drivers and mechanics; they could live long distances from their business and could have their railway station in their own back yard. Notwithstanding its great promise, the motor-car was not likely, however, to supersede electric traction for public service, although very useful for feeders and auxiliary traffic. In the principal thoroughfares of large cities with electric tramcars, a one-minute service running each way was no unusual thing. This meant something like 7,000 persons passing a given point to and fro every hour, in an undeviating course, swiftly, smoothly, and almost noiselessly and without any confusion whatever, and even three or four times that number was quite practicable without inconvenience. The present use of

horseflesh for transporting more or less heavy loads, especially on steep gradients, was in these days hardly worthy of science.

In conclusion, he said it would be almost impossible to overrate the extent to which their Association had improved the status of municipal engineers—largely by the great facilities afforded for the interchange of opinions and the obtaining of knowledge and information so willingly imparted by their members to each other in every sphere of their work. Neither could one over-estimate the advantages accruing to Local Authorities from the experience gained by their officers attending their meetings and inspecting the numerous and varied works of their confreres, especially when one considered that a very large proportion of the sanitary works of the country had, of late years, been done by the stipendiary officials of municipalities.

THE LONDON COUNTY COUNCIL.

The usual meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Camberwell Borough Council 8,000*l.*, towards the cost of extending Brockwell Park, and Lambeth Borough Council 20,000*l.* for the same purpose; Hampstead Borough Council 12,500*l.* for the purchase of a site for electric light station, and 7,898*l.* for the purchase of a site for a stone-yard for jarrah wood paving works; the Shoreditch Borough Council 4,060*l.*, the Camberwell Borough Council 14,200*l.*, and the Hampstead Borough Council 3,865*l.* for paving works; the Islington Borough Council 3,236*l.* for an electric light installation; the Stepney Borough Council 26,507*l.* for the same purpose; the Bethnal Green Board of Guardians 7,940*l.* for the erection, &c., of the infirmary; and the Wandsworth and Clapham Guardians 2,280*l.* for alterations to the board-room.

List of Rates of Wages and Hours of Labour.—The same Committee reported as follows, the recommendation being agreed to:—

"We have ascertained that by an agreement between the Amalgamated Society of Engineers and the London and District Association of Engineering Employers the rates of wages of workmen in the engineering trades have been increased 1*s.* a week, or 3*d.* per hour (according to the custom of the firm concerned), as from May 11 last. We therefore recommend—

"That the Council's list of rates of wages and hours of labour be amended, and that the rates of wages of the following trades be increased as follows—

	Increased Rate of Pay per Hour.
Brass finishers	8 <i>½</i> d. to 9 <i>½</i> d.
Coppersmiths	8 <i>½</i> d. to 9 <i>½</i> d.
Turners	8 <i>½</i> d. to 9 <i>½</i> d.
Fitters and erectors	8 <i>½</i> d. to 9 <i>½</i> d.
Millwrights	8 <i>½</i> d. to 9 <i>½</i> d.
Smiths	8 <i>½</i> d. to 9 <i>½</i> d.
Fatern makers	8 <i>½</i> d. to 9 <i>½</i> d.
Boyers	8 <i>½</i> d. to 9 <i>½</i> d.
Slotters and planers	8 <i>½</i> d. to 9 <i>½</i> d.

Conditions of Contracts—Variations in Rates of Wages, &c.—The General Purposes Committee brought up a report containing the following:—

"We have had under consideration the question of the insertion in contracts of provisions relating to alterations of wages and hours of labour during the continuance of such contracts.

The present standing order (No. 220, clause 7) relating to the matter is as follows:—

(7) Committees of the Council before inviting tenders are empowered in any case in which they consider it desirable to direct the insertion at the head of the schedule of rates of wages and hours of labour in the form of contract the following provision, but such provision shall not be inserted except by express direction of a committee—

"The lists of wages and hours of labour in Part I. and Part II. of this schedule are severally to be binding on the contractor subject to the following proviso which is to be considered as included in each part of the schedule, that is to say—

Provided always that if at any time or times and so often as the same may happen during the continuance of this contract in any trade mentioned or referred to in this part of this schedule a different rate of wages or different hours of labour from the rate of wages or hours of labour respectively provided for in this part of this schedule shall after the date of this contract be agreed to between the associations of employers and the union of work-

men in such trade in the district in which the work is being or is to be done then and from the date of any such agreement, and so long only and to such extent only as the same shall be in force, the rates of wages or hours so agreed upon shall be considered as substituted in this part of the schedule for the rates of wages or hours provided for in this part of this schedule for the same class of labour, and Stipulations 1 and 2 in Clause A of this contract shall be construed and have force and effect in all respects as if the substituted rate of wages or hours had originally been provided for in this part of this schedule instead of the rate of wages or hours therein provided for, and for this purpose any such agreement as aforesaid between the associations of employers and the union of workmen in any trade in the London district shall be considered as applying to all work done in that trade at the site mentioned in the specification in the 1st Schedule or within the radius mentioned in Part I. of this schedule.

The clause was first framed in 1893, but in August of that year there was an instruction from the Council that the clause should as a rule be omitted from contracts, but the Council at the same time empowered committees in any case where they considered it desirable to insert the clause before inviting tenders. The reason for the above instruction arose from an objection raised by the Thames Ironworks and Shipbuilding Company to the provision being inserted in their contract for the reconstruction of swing bridges and approaches at the Isle of Dogs. The Improvements Committee's report on the subject was as follows:—

"It is clear that a grave responsibility is cast upon contractors by the foregoing clause which the Council, on March 10, 1893, decided should be included in all contracts. The decision of the Council to include this clause was come to, not upon the recommendation of a committee, but by the adoption of an amendment moved upon a report, and we are therefore led to believe that the Council was not at the moment in a position to realise the effect of its decision. There is no doubt that if the clause is retained, contractors will endeavour to cover their liability by considerably increasing the amount of their tenders, and this increase will fall upon the Council, a result which we cannot think the Council desires to encourage. So convinced are we of the injurious effect of the clause that we have decided to recommend its withdrawal. If the Council agree with this, we think that in fairness to other contractors the work should be re-advertised. We recommend—

(a) That the words above quoted, beginning with "Provided always that," and ending with "Part I. of this schedule," be withdrawn from the form of tender and contract for the reconstruction of the four bridges at the Isle of Dogs.

(b) That fresh tenders be invited by advertisement for the reconstruction of the four bridges at the Isle of Dogs.

The recommendations of the Committee were adopted, and it was further resolved to refer the matter to the Fair Wages Committee with a view to their considering the expediency of omitting from forms of tender the clause in question. The Fair Wages Committee in due course reported in the following terms:—

"It will be remembered that, in consequence of representations made by the Thames Ironworks and Shipbuilding Company, whose tender for the reconstruction of the four bridges at the Isle of Dogs was the lowest, it was decided on the recommendation of the Improvements Committee to withdraw the clause from the form of tender and contract for that work. The clause had been inserted with the object of giving effect to an amendment, adopted by the Council on March 10 last, of the recommendation of the Works Committee submitting a list of rates of wages and hours of labour in pursuance of No. 1 of the Standing Orders made by the Council on December 16, 1892. The amendment provided for the list being altered from time to time, in accordance with variations agreed upon between the recognised unions of employers and workmen. We think that there has been a misapprehension of the intention of this amendment, which was only moved with reference to the list under consideration by the Council at the time and did not necessarily involve the insertion in forms of tender and contracts of such a clause as that in question, which would appear to be contrary to the provision in No. 2 of the Council's Standing Orders with regard to rates of wages and hours of labour, that "as regards each contract the list shall be that in force at the date of the tender." We are of opinion that it is desirable as far as possible to adhere to the principle laid down in this Standing Order, but as we desire above all that the Standing Orders shall be capable of application to all contracts, and there appear to be some contracts in which the insertion of a clause providing for variations of rates, &c., may be a matter of practical necessity, we have thought it well that committees should have a discretionary power of inserting it in exceptional cases. We accordingly recommend—

"That the clause quoted above be as a rule omitted from contracts, but that the Council do empower committees in any case where they consider it desirable to insert the clause before inviting tenders."

Consequent on the adoption by the Council of the above recommendation it has been the practice until quite recently to omit the clause from the form of tender and contract. Recently, however, upon the attention of the Committee being called to the matter, instructions were given for the insertion of the clause, and in these cases the Committees concerned in reporting upon the tenders have referred to the result of the insertion of the provision. In one case, viz., that of the tenders for the erection of a fire station, the Fire Brigade Committee reported that the architect was of opinion that the insertion of the stipulation largely accounted for the lowest tender being in excess of his estimate. In another case, viz., that of the tenders for the erection of artisans' buildings, the Housing Committee reported that the architect was of opinion that the insertion of the stipulation had some effect in damping competition. The above reports tend to bear out the view expressed by the Improvements Committee in 1893, that, if the clause was retained, contractors would endeavour to cover their liability by considerably increasing the amount of their tenders, and that that increase would fall upon the Council.

After careful consideration, we have arrived at the conclusion that it would be advisable if the provision were omitted from the contracts. We accordingly recommend—

"That Standing Order No. 220 be amended by the omission of Clause (7), relating to variations in the rates of wages and hours of labour during the continuance of a contract."

Alderman Dew moved to refer the recommendation back, in order that the representatives of the various associations of workmen and employers might be consulted in the matter. He could not see sufficient reason for the omission of the clause.

Mr. Taylor seconded, remarking that employers were satisfied with the existing clause.

Mr. E. White said there was no reason why either employers or employed should be consulted, as it was a matter entirely for the Council, who found that work cost more because in order to provide for a contingency contractors tendered higher than they would but for the clause.

Mr. Howell J. Williams said he thought the clause was absolutely superfluous, and there was no such clause in private contracts.

After further discussion, the amendment was agreed to and the report was referred back.

Tramway Extension.—The following recommendation of the Highways Committee was agreed to:—

"That application be made, in the next Session of Parliament, for powers for the construction by the Council of the undermentioned new tramways:—

1. Seven Sisters-road (existing lines), via Amburst Park, to Upper Clapton-road (existing lines).
2. Chelsea Bridge (north end) via Grosvenor-road, to a point near Lambeth Bridge.
3. Hampstead-road (tramways terminus), across Easton-road and along Tottenham Court-road, to a point near Oxford-street.
4. Edgware-road (from a point near the Marble Arch), to the county boundary at Cricklewood.
5. Harlesden (near the county boundary), via Scrubbs-lane, Wood-lane, Shepherd's Bush-road, Brook Green-road, and Fulham Palace-road to Putney Bridge.
6. Uxbridge-road (near the railway station), via Richmond-road, Netherwood-road, and Westwick-gardens to Shepherd's Bush-road.
7. A—Clapham Common, south side (L.C.C. Tramways) via Clapham Common, Battersea Rise, Wandsworth Common, north side, and East Hill to West Hill; B—West Hill, via Kingston-lane, to the county boundary.
8. A—Deptford (L.C.C. Tramways) via Blackheath-road and Hill and Shooter's Hill-road, to the Herbert Hospital; B—Herbert Hospital, via Woolwich Common-road, the road to the west of St. George's (garrison) church into New-road, and thence along Thomas-street and Green's End, to Beresford-square, Woolwich, and returning along New-road and Mill-lane, to a point in Woolwich Common-road near Nightingale-place.
9. New Cross-road (L.C.C. Tramways) via Lewisham High-road, Loampit Hill and Vale, Lee High-road and Eltham-road, to a point near Wellhall-lane at Eltham.
10. Streatham High-street (L.C.C. Tramways terminus) via Streatham High-road, to the county boundary at Norbury."

Improvements.—The Improvements Committee submitted the annual list of county improvements. The improvements are:—1. Scrubbs-lane, Brook Green-road, and Fulham Palace-road (Harlesden to Putney Bridge tramway). 2. Richmond-road (Uxbridge-road to Shepherd's Bush-road tramway). 3. Wandsworth Common, north side, East Hill, High-street, West Hill, and Kingston-lane (Clapham Common to Kingston-lane and the county boundary). 4. Shooter's Hill-road (Deptford to

the Herbert Hospital). 5. Lewisham High-road, Loampit Hill, Loampit-vale, Lee High-road, and Eltham-road (New Cross to Eltham). 6. Streatham High-road (Streatham Hill to the county boundary). 7. Queen's-road, Peckham. The various proposals were agreed to.

The "Rookery," Clapham Common.—Upon the recommendation of the Parks Committee, an estimate of 6,000*l.* was approved, and it was agreed to ask Parliamentary powers next Session to purchase at that price the property known as the "Rookery," Clapham Common, for addition to the open space on the common.

The Works Department.—The Housing of the Working Classes Committee brought up the following report:—

"We submit working drawings, specification, bills of quantities, and estimate of 23,932*l.* 5*s.* 4*d.* in respect of Seymour and Somerset buildings, which it is proposed to erect on the two sites cleared under the Churchway scheme, St. Pancras, which lie to the east of Churchway. The buildings will be both five stories in height, and will provide accommodation for 472 persons in two tenements of one room, 64 tenements of two rooms, 30 tenements of three rooms, and 4 tenements of four rooms. The estimate of the total cost of the buildings is made up as follows:—Erection of buildings, 22,507*l.* 10*s.* 2*d.*; provision for articles to be purchased direct, and for architect's expenses, quantity surveyor's fees, supervision and contingencies, 1,364*l.* 15*s.* 2*d.* We have referred the drawings, specifications, quantities, and estimate of 22,507*l.* 10*s.* 2*d.* to the manager of works. He has reported that he is prepared to undertake the work of erecting the dwellings, and we therefore propose that the drawings, &c., shall be referred to him for that purpose. We may mention that we are satisfied that the erection of these buildings at the amount of the architect's estimate will not involve any charge upon the county rate. We recommend

—That the working drawings, specification, and bills of quantities, together with the estimate of 23,932*l.* 5*s.* 4*d.* submitted by the Finance Committee, in respect of Seymour and Somerset buildings, Churchway, St. Pancras, be approved; that the work of erecting the dwellings be carried out by the Council without the intervention of a contractor; and that the working drawings, specification, bills of quantities, and architect's estimate of 22,507*l.* 10*s.* 2*d.* be referred to the manager of works for that purpose."

Sir John Dickson Poynder moved an amendment to the effect that the work be put out to contract, and quoted figures to show that whereas in twenty-one buildings carried out by the Works Department there was an excess over the architect's estimates of 25,571*l.*, in the case of sixteen works carried out by contractors the difference in favour of the Council was 17,576*l.*

Mr. Waterlow, Chairman of the Housing Committee, said he could not dispute the figures. Some of the excessive cost on the part of the Works Department brought with it lower tenders from the contractors. That was a feather in the cap of the Works Department. Contractors were now struggling to do the Council's work as cheaply as possible, so that they might wipe out the department. Under the old management there was an excess of 7 per cent., and under the new management there was an excess of 6 per cent. That was far from satisfactory, and he could not help thinking that the department ought to be able to do the work as cheaply as the contractor. At all events, they ought to be able to do it as efficiently as the contractor. The department were now showing small savings on some of their buildings. If that were not so he should not have been disposed to hand over the new buildings in St. Pancras to the department.

Mr. Frank Smith contended that they got full value for money in the work done by the Works Department, and therefore they had no reason to complain.

Mr. Burns, M.P., said that of all the builders who had done work for the Housing Committee only one (Messrs. Holloway) had had a second dose—the supervision exercised over the work broke the back of nearly every jerry builder. The losses alluded to occurred at the commencement of the Works Department, and the loss was diminishing, while it was more than counterbalanced by the excellence of the work and the pulling down of the builders' prices.

Lord Ribblesdale said it appeared to him that the Works Department was a source of perpetual but perfectly honest disagreement between several sections of the Council. In the case of the War Office, they had seen a perfectly independent body called in to say whether the administration was an advantage to the public or not, and he would like to see

the Council follow the example of Mr. Brodrick, and get together a perfectly independent committee to see whether the Works Department was an advantage to the ratepayer or not.

Mr. P. Harris said what Sir J. Dickson Poynder feared was that, if the work went to the Works Department, the estimates would be largely exceeded, and he wished that the work should be economically carried out.

Mr. E. White hoped that Lord Ribblesdale would succeed in inducing his Progressive friends to consent to a further inquiry as to whether the Works Department was a benefit to the ratepayers, but he did not think he would get them to consent. He contended that they had given the Works Department a fair trial, and it had failed. It was evident that the present system of the Works Department could not be allowed to continue much longer, for in three years they had added 62,000*l.* to the loss. They were spending 20,000*l.* per annum in management expenses on a concern turning over 200,000*l.* or 300,000*l.*, and nothing but disaster could follow.

Lord Welby said Mr. White had charged the present management with adding 62,000*l.* to the loss in three years, but it was not the fair way of looking at it. The present management ought not to be judged by the works they only completed, and were in no way responsible for accepting. As a matter of fact, the works for which the present management were wholly responsible showed a saving on the architect's estimates of 6,000*l.*

On a division, the voting was:—For the amendment, 28; against, 79; majority against, 51. The recommendation was then carried.

Tender.—It was agreed to accept the tender of Messrs. Ingram & Sons (139*l.* 8*s.* 6*d.*) for works to Mayford Industrial School buildings. The Council, having transacted other business, adjourned.

COMPETITIONS.

TECHNICAL COLLEGE, GLASGOW.—The Governors of the Glasgow and West of Scotland Technical College have accepted the design of Mr. David Barclay for the new buildings to be erected in George-street, and have appointed him architect for the carrying out of the work. Mr. Barclay's plan shows a floor area of about 144,000 square feet, and the cost of the building will be about 150,000*l.*

APPLICATIONS UNDER THE 1894 BUILDING ACT.

At the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Clapham.—One-story shops on part of the forecourts of Nos. 2 to 10, inclusive, Pennsbury-terrace, Wandsworth-road, Clapham (Mr. G. Sherrin for Mrs. C. E. Wigmore).—Consent.

Hammersmith.—A block of residential flats, with bay-windows and an angle turret, on the north side of Coldhawk-road, Shepherd's Bush, at the corner of Pennard-road (Mr. G. F. Grover for Mr. A. Yates).—Consent.

Hampstead.—A block of residential flats on the north side of West End-lane, Hampstead, at the corner of a footway adjoining West End Green (Mr. E. Bates for Mr. H. A. Rayner).—Consent.

Width of Way.

Westminster.—A building on the west side of Great Smith-street, Westminster, at less than the prescribed distance from the centre of Orchard-street (Mr. G. A. Hall for the Mutual Tontine Association, Limited).—Consent.

Bermondsey.—A one-story addition to a factory building on the east side of Wood's-place, Grange-road, Bermondsey, at less than the prescribed distance from the centre of the street (Messrs. Gordon & Gunton for Messrs. Ross & Co., Limited).—Consent.

Width of Way and Lines of Frontage.

Clapham.—A block of tenement houses on the east side of Gaskell-street, Clapham, at the corner of Union-road (Mr. S. A. White for the vicar and churchwardens of St. John the Divine, Clapham-rise).—Consent.

Formation of Streets.

Poplar.—That an order be issued to Mr. H. Hooper sanctioning the formation or laying out of a new street for carriage traffic in continuation of Cahir-street, West Ferry-road, Millwall (for Lady Cahir-street Charteris). That the name Cahir-street (in continuation) be approved for the new street.—Consent.

Chelsea.—That an order be issued to Mr. W. Murray sanctioning the formation or laying out of a new street for carriage traffic to lead from Fulham-road to King's-road, Chelsea (for Messrs. J. Veitch & Sons, Limited).—That the name Hortensia-road be approved for the new street.—Consent.

Hackney, North.—That an order be issued to Mr. C. Cheston sanctioning the formation or laying out of a new street for carriage traffic to lead from Upper Clapton-road to Portland-avenue, Hackney (for Lord Amherst).—That the name Leweston-place be approved for the new street.—Consent.

Means of Escape from Top of High Buildings.
St. George, Hanover-square.—The means of escape in case of fire on the sixth and seventh floors of No. 15, Berkeley-street, Piccadilly, for the persons dwelling or employed therein (Messrs. J. T. Wimperis & Arber for the Hotel and Club Investment Company, Limited).—Consent.

Space at Rear.

Kensington, South.—A modification of the provisions of Section 41 (1) (vi) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats on the south-east side of Brompton-road, Kensington, at the corner of New-street, with an irregular open space at the rear (Mr. C. W. Stephens for Margaret's Stores, Limited).—Consent.

Deviations from Certified Plan.

St. George, Hanover-square.—Deviations from the plan certified by the District Surveyor, under such Section of the Act, so far as relates to the proposed erection of a stable, with warehouse over, on a site at the rear of Nos. 45 to 48, Wilton-road, Pimlico (Messrs. J. Bartholomew & Co. for Mr. C. T. Cowley).—Consent.

The recommendation marked † is contrary to the views of the Local Authority.

Books.

English Cathedrals: A Description and Itinerary. By the Rev. T. PERKINS, M.A., F.R.A.S. London: George Bell & Sons 1901.

THIS is a volume of less than 100 pp., giving a very short description of the chief points of interest in the English cathedrals, illustrated with reproductions of photographs of each. The work, according to the preface, was originally intended by its compiler, Dr. Gilchrist, of Iowa University, for the use of Americans, and the map at the end of the book suggests a circular tour of the cathedrals, beginning and ending at Liverpool. An introductory chapter is given dealing with the general architectural features of the buildings and pointing out those which have always been served by secular clergy as distinct from the monastic foundations which became cathedral establishments after the Dissolution. The "typical plan" given on p. 15 is not very satisfactory; it would have been better to have given two plans of cathedrals— one of each type. Salisbury or Wells and Chester or Durham would have explained the difference well. The book, however, is, like those of Messrs. Bell's series, capably printed, and, apart from one or two errors—the whole of the nave and western towers at Bristol are modern, not only the "greater part"—seems to have been carefully edited and brought up to date. Although the larger books will probably appeal more to the average visitor to our cathedrals, the book before us will no doubt be found of value to those whose desire is to see and learn as much as possible in a limited time.

The Cathedral Church of St. David's. By PHILIP A. ROBSON, A.R.I.B.A. London: George Bell & Sons. 1901.

A RECENT addition to Messrs. Bell's Cathedral Series is the one dealing with St. David's, the most inaccessible of the cathedrals of England and Wales, and undoubtedly one of the most interesting. Mr. Robson acknowledges his indebtedness to Jones & Freeman's well-known book and others, and has used some illustrations from other books, but the majority

of the views are reproductions of photographs taken by the author. The photograph facing p. 3 well shows the west front before its re-building in 1862, and is of additional interest as in the foreground is a group including the late Sir G. G. Scott, Dean Allen, and Professor E. A. Freeman, all well known, apart from their connexion with the work that has been carried on for some years in repairing the church. We have not space for a detailed description of the book before us; it is, however, excellent both in matter and illustration, and we are glad to note that the ground plan is a good one—lent by Mr. T. Taylor Scott—and a great advance on some others of this series, where the ground plans have not been worthy of the book or subject. There is an excellent view of the interior of the presbytery taken in 1895, showing the stallwork and the remarkable screen east of the stalls; a part of the Rood screen showing the earlier work on the north side of the central doorway; a general view of the interior of the nave, and several picturesque views of the still unrestored Lady Chapel. In an appendix is a copy of the interesting report of the late Sir G. G. Scott, describing the means adopted to save the central tower from collapse, a work that caused all concerned great anxiety, but was happily in the end crowned with success. To those who know St. David's and its romantic situation and surroundings this little book will bring back many pleasant recollections; to those who have not been there it can be recommended as a capital handbook to the Cathedral and Palace.

The Benedictine Abbey of SS. Mary, Peter, and Paul at Pershore, Worcestershire. By FRANCIS B. ANDREWS, A.R.I.B.A. Midland Educational Company, Limited, 1901.

THE quarto monograph just published with the above title is a welcome addition to the already numerous works dealing with our monastic churches. In a space of less than fifty pages Mr. Andrews has written a concise account of the history and architecture of one of the most beautiful fragments of a Benedictine church in the Midlands. Less fortunate than Gloucester and Tewkesbury, it has lost its fine Norman nave, but the transept and eastern part of the church are fine examples of Norman and Early English date, and the central lantern tower is one of the most beautiful things of its kind in the country. The illustrations are for the most part all that could be desired, but the value of the ground-plan is lessened by the absence of any indication of difference in date apart from one or two notes. In addition to the plan are a valuable series of the elevations (north and west) and two sections (cross and longitudinal), two plates of details of mouldings and windows, and two reproductions of photographs, a south-east exterior view and an interior view looking east. In the cross section the east elevation of the south transept might have been shown with advantage—in many ways it is one of the most interesting portions of the exterior. The blocks in the text are numerous, and include photographs of impressions of seals and monuments, and drawings of various details of the building, a plan of the Grange at Broadway, and a reduced copy of encaustic tiles—some now in the Abbey church and others in a neighbouring cottage. Those from the church are not, however, quite sufficiently careful in their drawing—the author does not seem to have fully appreciated the amount of careful draughtsmanship that these tiles exhibit. On p. 19 is a very interesting illustration, giving measured elevations of a portion of the bellries at Pershore and Salisbury. Apart from the ball-flower ornament on the latter and the difference in the date the resemblance in the design is very striking.

The letterpress, which is full of interesting matter, is divided into two parts, the first dealing with the history and the second with the architectural details of the church. In the Addenda are copies of the Charter of Edgar, Domesday notes, and other documentary evidence, and the whole is well printed on good paper, and artistically bound in cloth boards.

In the *Builder* of October 2, 1897, was given a ground plan showing the various dates, a south-east view of the church, and measured drawings of the effigies, and other features which supply some omissions in Mr. Andrews' monograph.

New Tables for the Complete Solution of Ganguillet and Kutter's Formula for the Flow of Liquid in Open Channels, Pipes, Sewers, and Conduits. By Colonel E. C. S. MOORE, R.E., M.S.I. London: B. T. Batsford, 1901.

AMONGST the various more or less complicated formulas for calculating the flow of liquids, that of Ganguillet and Kutter is probably the most accurate and reliable, but its use involves a very considerable tax upon the time and patience of those who invoke its aid. The tables prepared by Colonel Moore practically cover all cases of roughness and inclination likely to occur in practice, and they supply values for expressions in the numerator and denominator of the equation as modified by the author. For use with the tables Colonel Moore presents what he terms an "abbreviated" form of his modification of the formula, but it would be more correct to describe it as a condensed form, inasmuch as all the essentials are included, some factors remaining as stated in the modified form, whilst other groups are represented by single symbols whose values are readily found from the tables. Part I. of the volume has been calculated for fifteen different values of (n) the co-efficient for roughness, and for 1,080 inclinations. Part II. has been added for use in special cases, and a diagram for the graphic solution is given at the end of the work. The tables present a complete solution of the Ganguillet and Kutter formula, they are of wide application, and should be much appreciated by hydraulic and sanitary engineers as tending to reduce calculations to the lowest possible limits.

Journal of the Sanitary Institute. Vol. XXII., Part I. April, 1901.

WITH the new century the Sanitary Institute commences a "New Series of Transactions." The size of the "Journal" is increased to super-royal 8vo (10½ in. by 6½ in.), and a smaller supplement is issued in which lists of new members and other matters of current interest are published. The pages of the "Journal" are therefore occupied almost exclusively by the papers read before the Institute and by the discussions thereon. The change is especially welcome in these days of rapid accumulation of printed matter. The first number of the new series is particularly interesting to architects. With the exception of the first paper, on "The State of London Streets," by Mr. Thomas Blashill, F.R.I.B.A., which is of general rather than professional interest, all the papers deal with matters connected with building. Dr. Christopher Childs communicates a valuable paper entitled "Ventilation: Success and Failure of Methods at Present in Use." Basing his opinion to a large extent on the oft-quoted researches of Drs. Carnelley and Haldane, but to some extent also on later work and on his own experience, he arrives at the conclusion that "for the ventilation of large schoolrooms having less than 16 square feet area per head, the plenum system is by far the best, and should be instituted wherever it is practicable." For small schoolrooms the so-called "natural ventilation" will probably be retained, but Dr. Childs thinks it necessary "to warm the incoming air." Although he considers the plenum system by far the best for large schoolrooms, he is "strongly inclined to the conviction" that it is not the best for hospitals. The paper gave rise to considerable discussion, which is well worth reading. Two lectures to sanitary officers, by Mr. W. C. Tyndale, M.Inst.C.E., on "Sanitary Appliances" and "House Drainage," are necessarily somewhat superficial, but are good as far as they go. The Report of a Committee of the Institute on "The Siphoning of Closet Traps" contains a record of numerous experiments in which reference has been already made in our "Student's Column" articles. Obituary notices of Professors Pelttenkofer and Fodor conclude the number.

Fergusson's Surveying Circle and Percentage Tables. A Book for Engineers, Surveyors, &c. By JOHN C. FERGUSSON, M.Inst.C.E. London: Published by the Author, 1901.

LIKE other engineers who have spent many years abroad, Mr. Fergusson has returned, bringing with him useful suggestions for the simplification of field-work. The object of the brief treatise under notice is to describe and

exemplify the uses and advantages of the surveying circle devised by the author when living in British Columbia in the year 1893. The circle in question is in the form of a dial with centesimal divisions, to be attached to magnetic compasses in place of the ordinary dial, which, as our readers are aware, is only divided into degrees. Various eminent mathematicians have attempted in the past to find a centesimal division of the circle worked with the quadrant. The author found it was impossible to establish any ratio between the tangential functions and the radius when working with so large a sector as the quadrant, but he claims to have solved the centesimal division of the circle by the idea that the tangent of an octant is equal to the radius, he found that, by dividing the tangent into 100 equal divisions, lines might be drawn from the points so obtained, to form divisions on the octant that would always subtend an equal space on an offset laid out at right angles to the quadrantal radius; these spaces being always equal to one-hundredth portion of the radius. When angles are read in the units of the octant, it is claimed that all trigonometrical problems can be solved by simple arithmetic. In the ordinary method, where the unit of angular measurement is the degree, the actual value of that division as a measure of departure from a fixed point can only be expressed by a formulae which represent values of the trigonometrical functions. In the case of the Fergusson circle it is clear that each separate division of the octant will always cover the same space upon an offset laid out at right angles to the quadrantal base-line; and as the space so covered is one-hundredth of the quadrantal base-line, it becomes evident that a ready means is afforded for the determination of distances in the required direction. Examination of the examples given in succeeding chapters of the book will show that the new surveying circle, used in conjunction with the percentage tables prepared by Mr. Fergusson, ought to result in a considerable saving both of field-work and of calculations. Arrangements have already been made for the manufacture of the new circle, which can be attached either in azimuth or vertically to old or new instruments at a moderate cost.

Correspondence.

To the Editor of THE BUILDER.

ARE BRICKLAYERS "DUNDERHEADS"?

SIR,—In your journal of the 22nd Inst. a report appears of a meeting of the members of the Royal Institute of British Architects, when a paper was read by Professor Letby entitled "Education in Building," and a discussion followed, in which Mr. Leonard Stokes joined. Mr. Stokes, in his criticism of the interesting paper, after a joke with ancient John the mason and Bob the carpenter, pays a high compliment to the bricklayer (though not intended as such), whom he calls a "dunderhead," which means a silly blockhead, a dunce, a thickskull, and this in nine cases out of ten. Mr. Stokes says the bricklayer makes all sorts of silly mistakes. "Bond was everything to the bricklayer, who would do anything to get that, and make the whole design subservient to some recognised rule of bond."

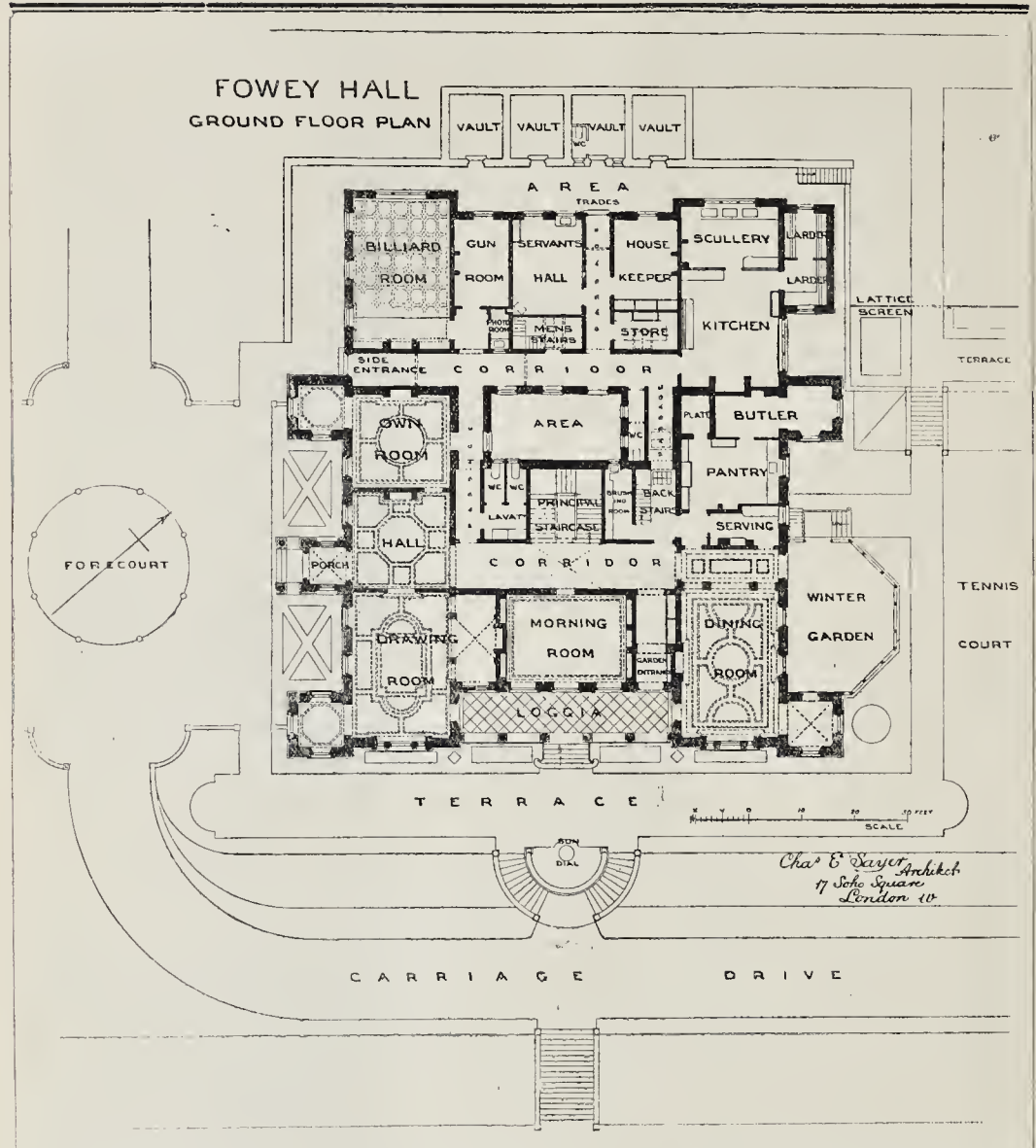
Mr. Stokes must know better. Evidently he was excited and ran away with himself, and lost proper control of words to express his views. The idea of properly bonded brickwork upsetting the design of a building is absurd. My experience is this:—I cannot persuade some bricklayers to take an interest and pride in their work, especially bond. "Good work and perpend kept" (as no doubt Mr. Stokes has it in his specification) looks well, even in a badly-designed building, and in a prettily-designed structure, whether cottage, church, or palace, it adds beauty thereto.

A BRICKLAYER CLERK OF WORKS.

WHAT CONSTITUTES A NEW STREET?

SIR,—I own a field in a borough town, and in front of this field runs an old road, 20 ft. wide at large. I prepared plans for dwelling-houses to be built in this field, along the old road on one side, showing 24 ft. roadway in front, the required distance from the opposite side as required by the by-laws.

These plans were presented to the Town Council, and the Clerk to that body ruled that they could not be built, as the building of such houses would be tantamount to the laying out of a new street, and that the width of such new street must be 35 ft.,



this being the specified width of all new streets, according to the by-laws.

I should be glad if any kind reader of your valuable paper would answer the following questions:—

1. What defines a new street?
 2. Was the Town Clerk correct in ruling that building such houses on one side would be tantamount to laying out a new street?
 3. Should the Clerk be correct by such ruling, can I be compelled to give up the required 16 ft. to make such new street, taking into consideration that the opposite side is a field and not built upon?
- I should think that the centre of the old road should be taken and each party to set back one half of the required width, viz., 18 ft. from the centre. An early reply will greatly assist.
- ONE IN DIFFICULTIES.

REVOLVING ENTRANCE DOORS.

SIR—Referring to the letter in the correspondence column of your last issue, signed "Entrance Doors," we beg to state that we are the manufacturers of the patent revolving draught-proof doors in question, and shall be glad to furnish full particulars of them to your correspondent on application.—For the Van Kannel Revolving Door Company, Limited,

T. J. STODDART, Secretary.

Illustrations.

THE ASHBURTON MEMORIAL, CHARTERHOUSE.

HIS fireplace and overmantel were placed in the armoury of the Charterhouse School in 1892 to commemorate the winning of the Ashburton Shield in three successive years—*ter deinceps reportati*, as the legend records.

Success still laid her laurels on succeeding teams, and it became necessary to provide more escutcheons to bear the winning names; the horizontal band was therefore inserted, as a retable, under the original framing. This accounts for the difference in tone shown in the illustration. The colour scheme is rich and harmonious, the materials used being statuary marble (slightly stained) and Spanish mahogany (dull polished), inlaid with a fret of holly enclosing the escutcheons of repoussé bronze, which bear the names of each team in raised silver letters. The arms and crest of the school are emblazoned.

The larger escutcheons are provided for the names of winners of the Spencer Cup, which is shot for after the Ashburton by the leading

marksman in each team. Tradition has it that to be victor in both trials is too severe a test for youthful nerve, and, at present, this escutcheon bears but one name.

The memorial and all its details, except the copy of the shield itself in the centre, is designed by Mr. Howard Ince.

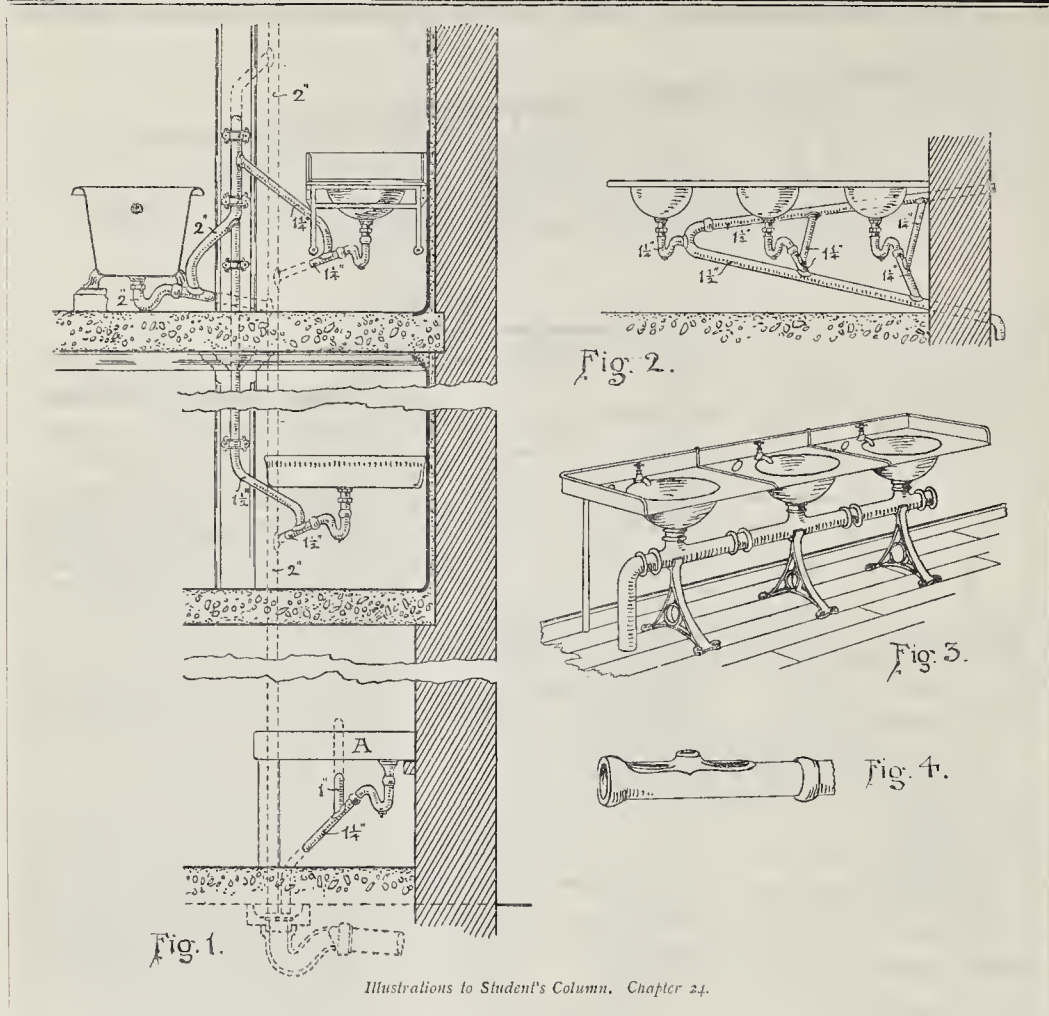
FOWEY HALL, CORNWALL.

THIS house has been built for Mr. C. A. Hanson, on the cliffs above Fowey, on the south coast of Cornwall, and enjoys magnificent views of sea and coast on three sides.

It is built of brick rough cast, with Douling stone dressings and tiled roofs. Owing to its position, exposed to the full force of the south-west gales, most elaborate precautions were necessary to keep out the weather.

These circumstances also considerably influenced the design, and the four towers are intended to give an appearance of strength by a suggestion of a castellated character.

The internal decorations are somewhat elaborate, and were carried out by Messrs. Gillows from the architect's designs. The general contractors were Messrs. Pethick Bros., of Plymouth. Messrs. Merryweather did the water supply; Messrs. Drake & Gor-



the sectional area of the anti-siphonage pipe (A, fig. 1) need not be much more than half that of the waste-pipe, as follows:—

1½-in. waste-pipe,	1-in. A.S. pipe,
1¼ " " "	1 " " "
1¼ " " "	1¼ " " "
2 " " "	1½ " " "

When a number of fittings on different floors are connected to a main waste-pipe of great height, especially if the fittings are of modern quick-waste type, the branch anti-siphonage pipes ought not to be less than the branch waste-pipes to which they are connected, and the main anti-siphonage pipe not less than the main waste-pipe. It cannot be too often insisted upon that quick-waste fittings subject traps to very severe strains, the effect of which must be mitigated as much as possible by ample ventilation. Anti-siphonage pipes connected with waste-pipes are generally fixed inside the buildings, and although it is better to fix them outside, there is not the same objection in this case as in the anti-siphonage pipes of soil-pipes, as the waste-pipes are disconnected from the drains, whereas the soil-pipes, as a rule, are not, and drain-air will therefore pass through the soil-pipes and through the anti-siphonage pipes connected with them. The main anti-siphonage pipe is generally connected to the upper continuation of the waste-pipe above the highest fitting; this economises piping, and is quite as effective as carrying it up independently to the same height as the waste-pipe vent.

Fig. 1 represents the waste-pipes and anti-siphonage pipes from the fittings of an ordinary terrace house, having a kitchen sink on the ground floor and a bath and lavatory on the

first floor. The basement sink A is not connected with the main system of pipes, but has a separate waste-pipe discharging into the same gully, and a separate anti-siphonage pipe. The lavatory waste is often connected with the branch from the bath, but it is much better to connect it directly with the main waste and above the point where the bath waste is connected, as shown in the illustration; there is then less risk of the lavatory trap being unsealed by a discharge from the bath, and the water from the lavatory cannot possibly enter the bath.

In the case of ranges of fittings the same principles can be applied as shown in fig. 2, each fitting being separately trapped and each trap being ventilated. Ranges of lavatories, however, are often supplied with cast-iron or brass traps and waste-pipes, and many of these are seriously defective, the horizontal pipe being fixed perfectly level, and the waste-pipes being exactly vertical. The result is that the discharge from a basin flows in both directions along the horizontal pipes and then drains slowly away to the outlet, leaving a soapy deposit behind. Such pipes ultimately become very foul. In many cases no provision is made for ventilating either the traps or waste-pipes. Sometimes the traps under the basins are omitted and a single trap is fixed at the outlet of the horizontal pipe. Fig. 3 shows such a range in cast-iron, the tops and basins and the inside of the waste-pipe being porcelain-enamelled; the trap is below the floor. This trap is often 2½ in. in diameter, and is never thoroughly flushed by the ordinary usage of the basins, as the volume of the discharges is too small and as the force is lost in the

horizontal pipe. Both pipe and trap, therefore, become foul, and some of the foul air contained in the pipe is forced out through one basin whenever another basin is discharged.

Ranges of lavatories supported on glazed-ware piers are often fitted with glazed-ware horizontal waste-pipes passing through holes in the piers; these look clean outside, but as the pipes are dead level they cannot be recommended.

All waste-pipes of the kinds mentioned ought to be supported on separate brackets quite independent of the standards or brackets carrying the basins, or ought to be attached to these standards or brackets by adjustable bearers, so that sufficient slope can be given to them, and the branch-pipes from the basins ought to be of varying lengths to correspond. The main waste-pipes ought also to be ventilated, and ought not to be too large.

Instead of the closed horizontal waste-pipe an open channel is sometimes fixed under the basins, so that it can be easily inspected and cleaned. In this case the basins need not be trapped, a single trap at the end of the channel sufficing for the whole range. Glazed-ware horizontal wastes are also made with inspection slits as shown in fig. 4. Frequently a glazed-ware channel is laid in the floor, and a separate pipe is taken from each basin to the channel. The great objection to this arrangement is the splashing of the water, although this can be to a great extent avoided by turning the end of each waste-pipe in the direction of the flow, and by making the channel of sufficient depth and with a slightly-projecting rim. Floor channels are generally used for ranges

of wash-tubs, and frequently also for ranges of baths. Of course the floors ought to be of impervious materials, and laid to fall towards the channels. The floors and channels can then be easily washed with a hose-pipe.

URINAL PIPES.

According to the definition already given, all pipes from sanitary fittings intended for the reception of urine and feces may be regarded as soil-pipes. In other words, soil-pipes are pipes (other than drains) receiving discharges from water-closets, slop-hoppers, and urinals. Just as different kinds of fittings may be connected to one main waste-pipe, so different kinds of fittings may be connected to one main soil-pipe. No objection can be raised to a single soil-pipe serving both water-closets and slop-hoppers, provided that the traps are properly ventilated. Nor can there be much objection to connecting the single trap (2½ in. or more in diameter) of a range of stall-urinals to the main soil-pipe, provided again that the trap is ventilated. But a single urinal-basin with small trap ought to be kept separate, as the seal of the small trap will almost inevitably be destroyed by the large and rapid discharges from water-closets and slop-hoppers, if all are served by a single soil-pipe.

Some experiments carried out by Mr. Hellver are interesting in this connexion. To the side of a stack of 3-in. lead soil-pipe about 9 ft. high, open at the top, and with the drain ventilated at a distance of 40 ft. from the foot, a branch-pipe was attached at the height of about 30 ft. To this branch-pipe traps of various kinds were fitted in turn, and each trap was tested by simultaneous discharges from four water-closets connected to the soil-pipe at various points above the branch. The total flush at each test was about fifteen gallons. When the branch-pipe was not ventilated, nearly every small trap fixed to the branch was siphoned out at the first discharge, including 1½ in. and 2 in. "Bower" traps, 1½ in. Dubois trap, 1½ in. and 2 in. cast-lead siphon traps, 2 in. "Eclipse" trap, and 1½ in. "Anti-D" trap. A narrow band D trap, measuring 1½ in. between the cheeks, and with 1½ in. outgo was unsealed at the fourth discharge. Larger traps gave better results, but were generally unsealed by a succession of discharges. A second series of tests was carried out on exactly similar lines, but with the branch pipe ventilated by a 2 in. pipe connected with the trap-ventilation pipes of the water-closets. This large ventilation pipe did not render all the traps proof against siphonage; a 1½ in. Dubois trap was unsealed by two discharges, a 2 in. half S cast lead trap by four discharges, a 2 in. Eclipse trap by six, and a 1½ in. anti-D trap lost 1½ in. of seal in three discharges, but ten successive discharges had no further effect on it. A 4 in. Eclipse trap was unsealed by ten discharges, but twenty-two discharges failed to lower the seal of a 4 in. siphon trap more than ¼ in.

These experiments show clearly the danger of connecting a small trap and branch to a soil-pipe serving a number of closets and slop-hoppers, although it must be admitted that the tests were much more severe than any likely to occur in the ordinary usage of the fittings. Cases may indeed occur where the choice must apparently be made between connecting a single urinal to a soil-pipe or providing a separate pipe of great length. The latter alternative involves a long pipe inadequately flushed, and certain to become coated with foul urates, while the former involves some risk of unsealing the urinal trap; but this risk is very small if (1) the soil-pipe serves only one or two other fittings, (2) the urinal is above these fittings, and (3) the traps are properly ventilated. In many cases, however, a third course is possible—namely, the fixing of a water-closet instead of the urinal basin. This will at once get over the difficulty, and will serve the purpose almost equally well if a proper type of closet is selected. Certainly this course is by far the best in private houses.


Pipes receiving the discharges from urinal basins only may be treated in the main as waste-pipes, but the pipes (including the trap-ventilating pipes) ought to be fixed outside the building, as the air passing through them is certain to be fouled by the accumulations of "fur." The pipes ought to be disconnected at the foot. In the case of a single urinal on the ground floor, the arrangement shown for the sink A in fig. 1 is often adopted, although it is defective in making no provision for floor droppings. Where two or more urinals on

different floors are connected to a main soil-pipe, the latter ought to be carried up as a ventilation-pipe to a suitable point above the eaves, and the traps ventilated after the manner shown in the upper part of the same figure. A range of urinal basins is sometimes treated in the manner shown in fig. 2, but with an additional ventilated branch and trap leading from the floor-channel which must be provided to receive droppings; part of the flush ought to be diverted into this channel in order to clean it and to keep the trap charged with water.

The pipes leading from ranges of basin-urinals are generally concealed behind the marble or slate backs, and cannot be inspected or repaired without pulling down the backs and basins. Damage to these will almost certainly result, but a still graver objection is that such an arrangement is directly opposed to one of the most important principles of modern plumbing, namely, that all pipes connected with sanitary fittings shall be exposed to view. For these reasons it is much better to adopt wastes of the kinds shown in fig. 3, chapter 19, discharging into a floor-channel from which a single trap and pipe are fitted. Exactly the same arrangement may be adopted for a single basin, the whole of the discharges passing through the floor-grate and trap.

Lead is the best material for urinal pipes. As the amount of water generally allowed for flushing urinals is so small, the trap and pipe from each basin ought not to exceed 1½ in. in diameter; a 1½ in. main pipe will be sufficient for a range of half a dozen basins as ordinarily flushed.

25.—SOIL-PIPES, &c.

 OIL-PIPES are pipes receiving discharges from water-closets and slop-hoppers, and sometimes from urinals, and, like Goldsmith's bed and chest of drawers, they pay a double debt, being in most cases used also as drain-ventilators. They ought not to be made to serve as rainwater-pipes, as such an arrangement results in the discharge of foul air under the eaves, whence it will in most cases find its way into the building through defective beam-filling or through adjacent windows. The ventilating action of the pipes is also seriously reduced in wet weather, if not entirely stopped, and in winter there is a danger of the pipes being choked with snow or ice. Nor ought soil-pipes to be made to receive the wastes from any other kinds of fittings than those mentioned above.

Ventilation.—Every soil-pipe, whether used as a drain-ventilator or not, ought to be carried up full-size to "such a height and in such a position as to afford, by means of the open end of such soil-pipe, a safe outlet for foul air." Many hard-and-fast rules have been laid down as to the distance between the open end of soil-pipe and the nearest windows, skylights, chimneys, &c., but like all Draconian laws, they are more honoured in the breach than in the observance. Some Sanitary Authorities have a by-law to the effect that the top of the soil-pipe must be above the highest part of the roof of the building to which the pipe is attached; this, in many cases, involves bends both at the eaves and ridge, and these bends seriously diminish the air-extracting power of the pipes, and also retard the inrush of air which is so necessary for the prevention of trap-siphonage. A certain amount of latitude ought to be allowed by Sanitary Authorities, and a little common-sense brought to bear in each case. If the drains are short and self-cleansing and disconnected from the sewer, the air in the soil-pipe will never be very foul, as the sewage will not have time to decompose before it has passed the disconnecting trap. In such cases there would be no danger in terminating the soil-pipe a little above the eaves even if this were only 3 ft. or 4 ft. above the nearest window and about 6 ft. distant from it. If, however, the soil-pipe is also a sewer-ventilator, or if the drains are long and foul, the greatest possible distance ought to be interposed between the soil-pipe and the nearest opening.

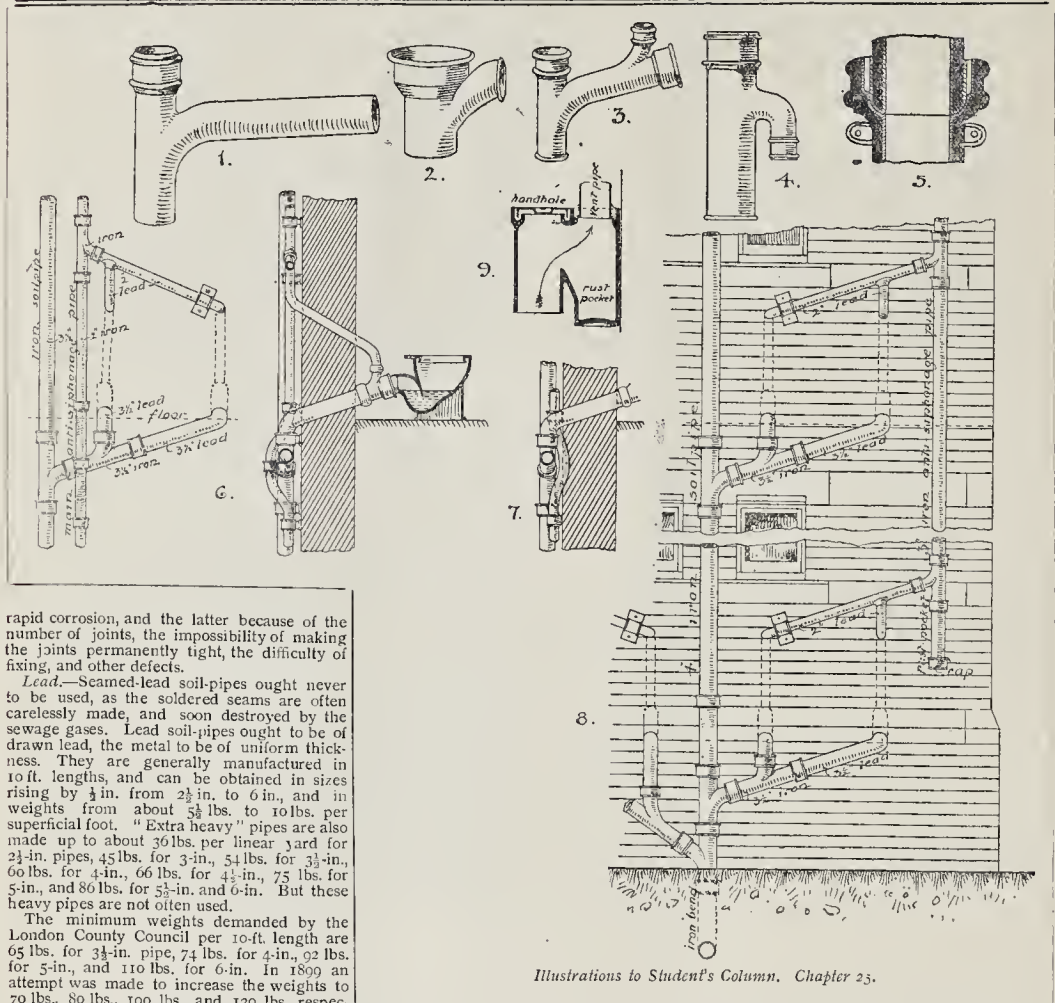
It is a mistake to fix an air-extracting cowl on the top of a soil-pipe, as this checks the upward current in still weather, and in high winds prevents the inrush of air required by the trap-ventilating pipes when a fitting is discharged. A simple conical or mushroom top of galvanised iron, copper, or lead is better, but the open wire guard is now generally used. This may be of "dome" or

"globe" shape, and can be obtained in sizes to fit pipes from 2 in. to 6 in. in diameter. The wire may be either galvanised iron or copper, but the latter ought always to be used, as galvanised wire is soon corroded.

Some years ago, the system of disconnecting soil-pipes from drains was introduced and was strongly advocated by many sanitarians. If the drains are long and foul, or if they are not disconnected from the sewer, a strong case can undoubtedly be made out in favour of the disconnection and foot-ventilating of the soil-pipes discharging into the drains; if the soil-pipes are not disconnected, the unsealing of a single trap will at once allow the foul air of the drains or sewers to enter the house, and how foul this sometimes is, all who have had any experience in sanitary work know. But if the drains are self-cleansing and are disconnected from the sewer, and if proper precautions are taken to prevent the closet and hopper traps being siphoned, there can be no objection to utilising the soil-pipes as drain-ventilators. The cost of a separate drain-ventilating pipe is saved, and the disadvantages which are almost inseparable from disconnection will be avoided. These disadvantages include splashing, retardation of the flow due to the additional trap at the foot of the soil-pipe, and occasional puffs of foul air through the grating over the trap. The latter may be to some extent obviated by substituting for the grating an air-inlet pipe carried to a suitable position and fitted with a mica-flap ventilator arranged to prevent the egress of air. The disconnection of soil-pipes has not come into general favour, and is at the present time explicitly prohibited by nearly all Sanitary Authorities, including the London County Council.

Diameter.—Until recently, soil pipes 4 in. in diameter were almost invariably used, except in stacks serving a number of fittings, when still larger pipes were fixed, but pipes 3½ in. in diameter are now considered large enough for ordinary stacks, and many sanitarians advocate still smaller pipes, as being more thoroughly cleansed by the small flush allowed and as being also less unsightly and less costly. There is, however, a greater risk of trap-siphonage when small pipes are used, and it is unwise to reduce the diameter below 3 in.; 3½ in. pipes are the smallest allowed by the London County Council. The outlets of many siphonic closets are only 3 in. in diameter, and the branch-pipes may be of the same size. Very long soil-pipes subject the traps of the fittings to greater strains than short pipes, and ought therefore to be of larger diameter, but it is very seldom indeed that pipes larger than 4-in. are required even for lofty stacks serving a number of fittings.

Materials.—The materials now almost invariably used for soil-pipes are cast-iron and lead, and opinions have been sharply divided as to their relative merits, but there can be no doubt that cast-iron is now in greater favour than lead. The fact is that neither material is perfect. Cast-iron soil-pipes, unless thoroughly protected inside by an impervious coating, are certain to corrode, and if the joint at the foot is improperly made the rust may accumulate there and ultimately choke the pipe. The pipes must be painted outside every year or two to prevent external corrosion. Cast-iron is also a brittle material, and may be broken or cracked by a heavy blow, and the damaged pipe will be difficult to remove, and will be of no value when removed. Again, every junction in a cast-iron soil-pipe necessitates three joints, one for the branch-pipe and one at each end of the junction-pipe, while only one joint is required for each branch in a lead soil-pipe. More joints are also required in the straight portions, as cast-iron pipes are made in 6 ft. lengths, and drawn-lead pipes in 10-ft. lengths. On the other hand, lead pipes, on account of their softness, are easily dented by blows, and dragged and twisted by the sun and by gravitation; they are more costly, and require more skill in fixing. They are, however, practically incombustible, and a cracked pipe can be repaired with solder or can be cut out and replaced by a new length without much difficulty, and the old pipe will fetch a fair price. A few years ago a lead-lined iron pipe was designed to combine the advantages of the two materials, and has already been extensively used. Some Sanitary Authorities allow either lead or iron pipes to be used externally, but insist on internal pipes being of drawn lead. Zinc and stoneware have also been used for soil-pipes, but are quite unsuitable for the purpose, the former on account of it



Illustrations to Student's Column, Chapter 23.

rapid corrosion, and the latter because of the number of joints, the impossibility of making the joints permanently tight, the difficulty of fixing, and other defects.

Lead.—Seamed-lead soil-pipes ought never to be used, as the soldered seams are often carelessly made, and soon destroyed by the sewage gases. Lead soil-pipes ought to be of drawn lead, the metal to be of uniform thickness. They are generally manufactured in 10-ft. lengths, and can be obtained in sizes rising by $\frac{1}{4}$ in. from $2\frac{1}{2}$ in. to 6 in., and in weights from about $5\frac{1}{2}$ lbs. to 10 lbs. per superficial foot. "Extra heavy" pipes are also made up to about 30 lbs. per linear yard for $2\frac{1}{2}$ -in. pipes, 45 lbs. for 3-in., 54 lbs. for $3\frac{1}{2}$ -in., 60 lbs. for 4-in., 66 lbs. for $4\frac{1}{2}$ -in., 75 lbs. for 5-in., and 80 lbs. for $5\frac{1}{2}$ -in. and 6-in. But these heavy pipes are not often used.

The minimum weights demanded by the London County Council per 10-ft. length are 65 lbs. for $3\frac{1}{2}$ -in. pipe, 74 lbs. for 4-in., 92 lbs. for 5-in., and 110 lbs. for 6-in. In 1899 an attempt was made to increase the weights to 70 lbs., 80 lbs., 100 lbs., and 120 lbs. respectively, but the suggested alterations have not yet come into force. The minimum weights required by the existing by-laws give a thickness of metal equal to sheet-lead weighing about 65 lbs. per square foot, which the suggested alterations would have increased to about $7\frac{1}{2}$ lbs. per square foot. The latter weight is sufficient for all ordinary purposes, although some sanitarians think that metal, weighing less than 8 lbs. per square foot, ought never to be used for soil-pipes; where the money can be afforded, pipes with metal weighing 10 lbs. per square foot are often used. As a ready means of calculating the thickness and weight of the metal, it is convenient to remember that a square foot of lead 1 in. thick weighs about 50 lbs.; the weight of metal $\frac{1}{4}$ in. thick is therefore very nearly $7\frac{1}{2}$ lbs. per square foot.

The joints in lead soil-pipes and between lead and iron, lead and pottery, &c., have been described and illustrated in chaps. 22 and 23. The method of fixing remains to be considered. Pipes in chases are fixed on blocks by means of lead flanges soldered to the pipes; the joints may be of the flange type (fig. 5, chap. 23), and an additional flange with blocks should be provided between each pair of joints, so that the pipes will be supported every 5 ft. Pipes fixed to the face of a wall may be united by wiped joints and supported by lead tacks soldered to the back of the pipes. The lead should be of the same thickness as the substance of the pipe, and should be about 4 in. wide if not to be folded, and double this width if folded to protect the nail-heads; the height should be 9 in. or 10 in., so that three nails can be driven through each tack into the joints of the brickwork. Tacks are sometimes placed singly and alternately on

opposite sides of the pipe; at least three ought to be allowed for each 10-ft. length. Greater strength with neater appearance is obtained by fixing them in pairs, allowing two pairs to each length. The nails may be of iron, 3 in., $3\frac{1}{2}$ in., or 4 in. long, or of copper or gun-metal, the two latter metals being more expensive but much more durable; the heads are often rounded. Copper-bit joints are sometimes used, the pipes being fixed with tacks and ornamented at the joints with lead beads, as shown in fig. 2, chap. 22. Cast-lead sockets (fig. 3, chap. 22) or cast-lead sockets strengthened with copper (fig. 4, chap. 22) are also good methods of fixing. Additional support ought to be given by a pair of tacks at the middle of each length.

Cast-lead sockets (fig. 1), $3\frac{1}{2}$ in. and 4 in. in diameter, with arms from 15 in. to 30 in. long, are now made, so as to avoid the "branch" wiped joint close to the wall. The arm can be connected to the closet by a brass socketted ferrule (fig. 2), in which a 2-in. branch is formed for the lead anti-siphonage pipe. If the anti-siphonage pipe is of iron, a socket is cast on the end of the curved branch, so that the end of the pipe can be caulked into it. The feet of lead soil-pipes may with advantage be connected to cast-iron bends, which ought to have foot-rests cast on and to be supported on flags or concrete; iron bends are better able to resist the impact of the falling liquids and solids, and also allow a good connexion to be made with the drain.

Iron.—Wrought iron is seldom used for soil-pipes, although it is well adapted for the purpose. As a rule, cast-iron pipes are used in 6-ft. lengths with socket joints caulked with lead. Special lengths can, of course, be cast

to order. The great defect of the material is its liability to corrosion, particularly in that part of the pipe above the highest branch. Unprotected iron pipes ought, therefore, never to be used. A coat of paint applied to the outside is of no use in preventing internal corrosion. Pipes galvanised inside and out can be obtained, but the cost is about double that of plain pipes and the protection is only temporary. Dr. Angus Smith's solution, applied at the foundry, is the cheapest preservative, and is fairly durable but not by any means permanent. The Bower-Barff process is not so often used for soil-pipes, and is not always successful. Glass-enamelling affords, perhaps, the best protection, but care must be observed that the enamel is perfect throughout the pipe and that it is not damaged by cutting or jointing the pipes.

Light rainwater pipes must *not* be used as soil-pipes, as it is impossible to make a proper caulked joint in them on account of the narrowness of the sockets and the thinness of the metal. The least weights now allowed by the London County Council are as follows, for each 6 ft. length:— $3\frac{1}{2}$ -in., 48 lbs.; 4-in., 54 lbs.; 5-in., 69 lbs.; and 6-in., 84 lbs. These weights give a thickness of metal ranging from about $\frac{1}{8}$ in. for $3\frac{1}{2}$ -in. pipes to $\frac{1}{4}$ in. for 6-in. pipes. Pipes much lighter than these are made and sold as soil-pipes, but cannot be recommended. Heavier pipes, weighing about half as much again as the London County Council pipes, can also be obtained. For $3\frac{1}{2}$ -in. or 4-in. pipes, the metal ought to be not less than $\frac{1}{4}$ in. thick, and slightly more for larger pipes. The sockets in cast-iron soil-pipes ought to be at least $2\frac{1}{2}$ in. deep, and the annular space allowed in the sockets for caulking not

less than $\frac{1}{4}$ in. wide for the two smallest pipes, and $\frac{3}{8}$ in. for the others.

Cast-iron pipes may be fixed with ears or clips nailed to the walls. Special projecting ears or sockets are now made so that the pipes will stand well clear of the wall; these are a great improvement, as they allow the pipe to be painted all round. If special ears are not provided, the same result can be obtained by using longer nails and driving them through short distance-pieces of wrought-iron pipe (1 in. or $1\frac{1}{2}$ in. long) placed behind the nail-holes of the ears or clips. External corrosion is certain to occur if the pipes are fixed close to the wall, as the back parts cannot be painted.

Special junctions, bends, &c., are now cast for almost every conceivable requirement. A junction ought always to be formed with the branch rising slightly from the pipe, and curved at the point of junction. The branch can be cast of any length from 6 in. to 36 in., so that it is unnecessary to make a joint in the thickness of the wall. Fig. 3 shows such a junction and branch $\frac{3}{4}$ in. or 4 in. in diameter, with a 2-in. socket for the trap-ventilating pipe; a socket is cast on the end of the branch to receive the outlet of the P-trap of the closet. The end of the branch is sometimes cast with an upward bend to receive the outlet of an S-trap. Junctions for the upper ends of trap-ventilating pipes are cast as shown in fig. 4. Bends for the feet of soil-pipes ought to be well rounded, and with foot-rests cast on to give them firm bearing on flags or beds of concrete. Set-offs or double bends to fit base-courses, eaves-troughs, &c., are also made, but ought to be used as sparingly as possible, as all bends obstruct the currents of air.

Lead-lined Iron.—Lead-lined iron pipes are manufactured by the Sanitary Lead-lining and Pipe-bending Company, and consist of an outer pipe of iron and an inner lining of lead. The lead is smooth and practically incorrodible by ordinary domestic sewage, and the iron protects the lead from external injury and gives it the firmness which is so lacking in ordinary drawn-lead pipes of large diameter. The cast-iron pipes are carefully made, and are smoothed inside by means of emery rubbers on a rotating spindle. The drawn-lead tube, of a substance equal to sheet-lead 5 lbs. per square foot, is then inserted, and is tightly pressed against the iron by means of a smooth steel bobbin, which is pulled slowly through the double pipe. The upper end of the lead tube is opened out to fit the special shape of the cast-iron socket, and the lead is turned outwards round the spigot-end of the iron pipe to form a kind of lead collar, as shown in fig. 5. When two pipes are fitted together, the joint can be completed by filling the annular space with molten lead, or by caulking it with cold lead rings, or by inserting a brass caulking-ring and caulking the lead lining on to it. The lead lining of junctions, &c., is introduced by casting, special cores being used for the purpose. Bends and junctions of almost every kind can be made. The invention is decidedly useful. The pipes and fittings are admirably adapted for soil-pipes, waste-pipes, and drain-ventilating shafts. They are naturally more expensive than ordinary iron pipes, but the extra cost is a trifling item in the total cost of a building. On the other hand, they are clean, durable, strong, and easily fixed. The lugs are of a special kind, so that the pipes can be fixed at any distance from the wall up to 24 in.

Anti-siphonage Pipes.—As already stated, soil-pipes and the trap-ventilating pipes connected with them ought, where possible, to be fixed outside the building, as all the pipes contain air more or less impure. In the case of stacks serving only one or two fittings, this presents no difficulty; but when ranges of closets on two or more floors are connected to one soil-pipe, the various pipes are not so easily arranged. If the soil-pipe and main anti-siphonage pipe are fixed near each other, bends must be introduced so that the soil-pipe branches and the main anti-siphonage pipe can pass each other. It is generally considered best to form the bends in the anti-siphonage pipes, but as these bends interfere with the free rush of air to the branches, the anti-siphonage pipes may with advantage be made somewhat larger than the usual 2 in. The anti-siphonage pipes may be bent round in front of the soil-pipe branches (fig. 6), but if the soil-pipes are fixed 14 in. or 2 in. clear of the wall, the bends will be somewhat quick and unsightly, and it is, on the whole, better under such circumstances to bend the anti-siphonage pipes behind the soil-pipe

branches (fig. 7), cutting small chases in the walls where required.

Another and better method of overcoming the difficulty consists in fixing the main anti-siphonage pipe at such a distance from the soil-pipe that it will pass quite clear of the soil-pipe branches, as shown in fig. 8. This illustration shows an arrangement for hospital or other building of two or more stories, with two fittings on each floor. The main soil-pipe and external branches are of cast-iron 4 in. in diameter, with 1-in. metal, while the branch pipes passing through the wall are of drawn lead of a substance equal to sheet lead $\frac{7}{8}$ lbs. per square foot. The main anti-siphonage pipe is 3 in. in diameter, and is also of cast-iron, the branches being of lead 2 in. in diameter. The main pipe is carried down a short distance below the lowest branch to form a rust-pocket; if the pipe is glass-enamelled inside, the rust-pocket will not be required. The top of the main anti-siphonage pipe is not connected to the soil-pipe, but is terminated at or about the same level, and covered with a copper-wire guard. If there are fittings on both sides of the soil-pipe two anti-siphonage pipes will be required, one for the fittings on the right and the other for those on the left.

In the best of circumstances two or more bends are required in an anti-siphonage pipe, and when iron pipes are used it is difficult to avoid having one of the joints within the thickness of the wall. For this reason it is certainly better to use lead for the internal pipes, even if the external pipes are of iron, as fewer joints are required with the former material.

Drain-ventilating pipes are required at the heads of long drains when soil-pipes are not available for the purpose. They ought to be not less than $\frac{3}{4}$ in. in diameter, but are all the better if made of the same sizes as the drains to which they are connected, that is to say (in the majority of cases) 4 in. They must be fixed outside the building, and treated like soil-pipes. If the pipe is of cast iron, and not glass enamelled, a rust pocket of iron or pottery (fig. 9) must be fixed at the foot, as the damp air from the drain soon corrodes unprotected iron, and the rust falling from the pipe may choke the bend at the foot, and so render the pipe utterly useless. The pocket illustrated is known as the "Loco" rust pocket.

Safes under sanitary fittings are not now fixed as frequently as in former years. When the fittings are badly designed and the plumbing executed by ignorant and careless workmen, safes may be considered necessary in order to prevent damage being done by leaks to the floors and ceilings below, but in such cases the safes are a source of danger, especially if the fittings are enclosed, as leaks may pass unnoticed or unremedied for a long time. The proper course is to use fittings of good design and to fix them in such a manner that safes are unnecessary. If a safe is fixed, it must not be connected to the waste-pipe or soil-pipe, but must be drained by a separate untrapped pipe carried through the nearest wall and terminated by a hinged brass or copper flap to prevent to some extent the ingress of air. Slabs of marble, slightly dished, are sometimes fixed under unenclosed lavatories and other fittings to catch droppings, but these do not require waste-pipes; the droppings can easily be wiped up with a cloth.

ST. THOMAS'S HOSPITAL.

Two new operating theatres and a new children's ward have just been completed in St. Thomas's Hospital.

In the hospital, as built in 1870, there were but two operation theatres. For many years that was ample accommodation, and it was a rare event for the two theatres to be in use at the same time. In 1890 the theatres were renovated and a mosaic floor added, and at the same time arrangements were made by which both theatres were available for operations every afternoon. In 1899 it became obvious that more theatres were needed, the number of operations having increased from 791 in 1890 to 2,810 in 1898. The original theatres were very large, very lofty, and provided with a spacious auditorium, which was necessary in the days of few operations and large audience, but unnecessary at the present time when operations are many and the spectators few in number. The size of the theatres made many difficulties in adequate cleaning, and these were enhanced by the fact of having an open roof supported by many tie rods. From measurements it was found that two theatres of sufficient size could be formed on the area occupied formerly by one, and as the form of roof had to be altered it

was decided to raise this, put the theatres on the next story, and provide on the old theatre level a new children's ward. By building on the opposite side of the corridor to the theatre, room has also been found for the addition of much needed extra theatre offices. The two new theatres, and the various rooms in connexion with them, are built round the theatre corridor. The theatres proper, anaesthetising and sterilising rooms are placed on the west side, and on the east side the dressing-room for the surgeons and dressers, recovery-room for the patients, and sister's storeroom. The two theatres are parallel to one another, side by side, and opening at the back into a common lobby, from which they lead out on either side an anaesthetising room for each theatre, and also a passage which permits the withdrawal of patients after operations without the necessity of taking them through the anaesthetising room in sight of a still conscious patient. On the south side of the west anaesthetising room is the sterilisation room which will be used to supply both theatres. This will contain a pressure steam steriliser for dressings, a water steriliser for the supply of germ-free saline fluid, and a large copper boiler for the cleansing of mackintoshes.

One description will serve for both theatres, as the arrangements and fittings are identical. The light is obtained from the skylight facing north, and beneath this at the north end of the theatre is the auditorium, consisting of four raised tiers, the bottom one of which is 9 in. above the floor level, and made broader than the succeeding tiers; it is intended for the accommodation of a hospital staff. The remaining tiers are intended for the students and visitors, and are made, as usual, narrow and of considerable height, so that a good view of the operation can be obtained even from the top step. The whole auditorium is made solid and of white marble, it having been decided that skeleton staging was objectionable on account of the difficulty of keeping it adequately clean and free from dust. The auditorium is separated from the floor of the theatre by white enamelled rails.

On one side of the theatre and running the whole length of the wall are two shelves, destined for the reception of lotions, sterilised fluids, hand towels, operation blouses, &c. Beneath these is a series of five sinks, the first two for hand washing, the third for the reception of the filters, the fourth as a cool-tray for porringers and operation trays, and the fifth as a slop-sink for the use of the theatre sister. The shelves and sinks are all carried on cantilevers, a space being left between them and the wall, thereby avoiding angles that must necessarily occur if the sinks and shelves are bedded against the wall. On the wall facing the auditorium are arranged the sterilisers for instruments, porringers, and operation trays as well as rose burners for the boiling of slabs containing normal saline. Opposite to the slabs a large glazed earthenware slab is provided for the mixing of plaster and the making of plaster splints, and above this is another shelf for the reception of hypodermic injections and various articles that may be required on emergency. In the surgeons' room there are sinks for the preliminary washing of the hands, and here will be kept the operation boots or overshoes and the sterilised operation blouses. In this room the operator and his assistants will remove their outer clothing and boots, and substitute in their stead the clean blouses and boots, so that no dirt is carried into the theatre proper. In the theatres proper and the rooms immediately opening out of them the walls have been covered with a dado of marmorite, which is a form of tough opaque glass, and offers a preference to complicated washing basins, and the drainage from these has been provided by an open channel on the floor, which has only one trap when it passes out of the theatre. Instead of pedal taps simple taps have been fixed. These are fitted with roses, so that they deliver a spray of water at the required temperature, and are kept running the whole time during which the operations are in progress. The surgeon can, therefore, wash his hands without being compelled to touch the taps, and in addition he washes his hands in constantly changing water. It is believed that this arrangement is much to be preferred to basins fitted with pedal-action taps, which can only be worked by a rather complicated system of pipes, valves, and actuating rods. The usual practice of rounding out all angles has been adopted, but the radii of the circles are much larger than usual, thus rendering cleaning even easier than is commonly the case. The theatre furniture is of the usual glass and iron pattern.

The Pienum system of ventilation and heating has been adopted for the theatres and children's ward. The work has been carried out by Mr. Key, of Glasgow, on his well-known system.

The New Children's Ward.—The tiling in the children's ward has been executed by Messrs. Doulton & Co., in accordance with a scheme drawn up by Mr. Stephen G. Holland, a governor of the

Hospital. All the tiles have been specially made for the ward, the angles being made of a rounded section, and the junction with floor and ceiling is formed with concave mouldings. The series of picture panels deals with various well-known nursery stories. The panels are of large size, and have been executed in "under-glaze faience." The whole of the designs were made by one of Messrs. Douillon's artists—Mr. W. Rowe—and were carried out at their Lambeth works.

The architect for the whole of the works is Mr. Percival Curry, of London.

GENERAL BUILDING NEWS.

PROPOSED NEW CHURCH, BYLEET, SURREY.—Mr. W. D. Carie, of Whitehall, has been appointed architect of the proposed new church at Byleet Corner. The church will be built externally of flint and stone, and internally of stone only, and will accommodate 350 persons.

METHODIST CHAPEL, WESTGATE HILL, BIRSTALL.—The memorial stones of a new Methodist chapel were laid at Westgate Hill, Birstall, recently. The new chapel will be built from plans prepared by Messrs. Walker & Collinson, of Bradford. Two front entrances will give access to a central vestibule, over which will be an end gallery. In the nave, chancel, and transepts there will be accommodation on the ground floor for 450 people, and for ninety in the gallery. It will cost about 4,000l.

ADDITIONS TO PRESBYTERY, DUBLIN.—For some time past additions to the Presbytery of St. Francis Xavier's Church, Upper Gardiner-street, have been in progress. The architect is Mr. William H. Byrne, and Mr. James Kiernan was entrusted with the contract. The new building, which is five stories high, is 50 ft. long by 47 ft. in depth. In the basement are situated a recreation-room for the community, a servants'-room, cooks'-room, with grocery store, vegetable store, larder, butlers'-room, pantry, china-closet, &c. From the basement upwards there are thirty-five apartments, including a reception-room, waiting-rooms, parlours, &c. A library is placed in the top floor. A reading and copying room are also provided, and various rooms and corridors are off the library. The building is constructed of Dublin brick and Ballyknockan granite.

NEW BOARD SCHOOLS, LOUGHBOROUGH.—The plans of Messrs Barrowcliff & Allcock have, as we have already stated, been selected in the competition for the new schools which are to be erected in Rendall-street on the Toothill-road estate, Loughborough. Mr. Evans, of Nottingham, acted as the assessor. The site upon which the schools are to be built is about an acre in extent, with a frontage to Howard-street, Rendall-street, and Charles-street. The schools are to be built on the central hall system—on the ground floor—with one exception, the pupil teachers' centre being a two-storied building at the Charles-street end. Accommodation is to be provided for 570 scholars in the mixed school. From the large central hall, measuring 74 ft. by 35 ft., there will be an entrance to eight different classrooms. On either side of the hall there will be a long clearstory window, with smaller ones at each end. Rooms for the accommodation of male and female teachers are to be provided between the mixed school and the infants' school with a separate entrance from Howard-street. At the rear of these there will be the girls' cloak-room and stores for general use. The infant school, accommodating 260 children, will have a central hall 53 ft. by 25 ft., with four classrooms and a room for the volunteer scholars. Defective children will be accommodated in a room, capable of seating twenty-five, at the south-west angle of the building. There will also be classrooms and a playground separate from the infants' school. On the north side of the infants' central hall cookery classrooms are to be erected. The gallery will accommodate fifty-five, and there will be floor space for demonstration and practical work. The pupil teachers' centre buildings will be at the corner of Charles and Rendall-streets, with a separate entrance for boys and girls. These will command a view of both central halls. The lecture-hall will be 45 ft. by 25 ft., and it is so designed that it can be divided into two classrooms. Each of the two classrooms will accommodate forty-two scholars. There will be a playground for each of the three departments. Drinking fountains are also to be provided. Near the entrance to each department there will be cloakrooms. The scheme provides for the external facing of the building with local red bricks with dressings of tawned terracotta. The roofs are to be covered with Broseley tiles.

BOARD SCHOOL, STONE NEWINGTON.—A new board school in Stoke Newington-road, which has been built at a cost (including the site) of more than 40,000l., was formally opened on the 17th inst. by the Hon. E. Lyulph Stanley, Vice-Chairman of the School Board for London. The new school has a frontage to the main road, and gives accommodation for 608 boys and girls and 308 infants. There is also a separate building for deficient children. Mr. T. J. Bailey is the Board's Architect.

DRILL HALL, HORNCASTLE, LINCOLNSHIRE.—The foundation-stone of the new drill hall was laid at Horncastle on the 13th inst. The site of the new hall is at the south-east corner of the Wong, a

public recreation-ground fronting the Boston-road. The total cost of the new hall will be about 2,500l. The building will comprise a hall, an orderly-room, armory, officers' room, sergeants' room, men's recreation-room, canteen, magazine, and bandroom. The contractors are Mr. J. S. Heath and Mr. G. Y. Pike, of Horncastle, and the architect is Mr. Butcher, of Spilsby.

MARKEET, LYNTON.—The new market for Lynton has now been completed. The building, which is of local stone, with Bath stone dressings, consists of a market hall, shop, lavatories, and waiting-room. Contiguous to the market hall is a depot for the Urban District Council, the front elevation of which is designed to allow for any future extension of the Market Hall without much alteration. At the extreme end of the block is a public convenience. The whole of the building is lit by incandescent electric lamps. Messrs Woolway & Sons, of Barnstaple, were the contractors. The building is from designs prepared by Mr. W. H. Chowins, Surveyor to the Council.

RADCLIFFE LIBRARY, OXFORD.—The degree of D.C.L. *honoris causa* conferred in a Convocation held on the 18th inst. upon Cornelius Neale Dalton, C.B., Master of the Drapers Company, on the occasion of the conveyance to the University of the New Radcliffe Library, which has been built by that Company at a cost of more than 21,000l. The building has been erected from designs by Mr. T. G. Jackson, R.A. It forms a projecting wing of the museum, and consists of two upper rooms about 80 ft. in length, fitted up as libraries with all accommodation for readers, as well as a basement for the storage of books.

EXTENSION OF GLASGOW UNIVERSITY BUILDINGS.—The additions being made to the buildings of Glasgow University on the eastern side are now nearing completion. The buildings, of white sandstone, are in the Scotch Baronial style. They are for anatomical purposes, and will be fitted throughout in the most modern manner. There are two basement floors, the first being occupied with boiler, engine, and fan rooms. On the second there are very large laboratory, lecture theatre, and preparatory-room, besides necessary engine and boiler accommodation. The ground floor provides for a laboratory about 140 ft. by 60 ft., adjoining which are the lecture theatre, museum gallery, and modelling-rooms. In addition there are the professors' rooms and cloakrooms. The first floor contains a practical mechanics' laboratory, drawing-room, and usual professors' rooms and cloakroom accommodation. Photographic darkroom and tank, &c., occupy the attic space above this. The buildings have been designed by Messrs. John Burnet & Son, architects, Glasgow, and have been superintended during progress by Mr. Thomas Douglass, clerk of works.

BUILDING IN BELFAST.—The last batch of tenders in connexion with the proposed municipal electric lighting system has now been given away. The total of this batch comes to 60,500l. The contract for the nineteen small substations around the city has been given to Messrs. J. & W. Stewart, of Belfast, who are at present building the electric lighting station at the Pigeon House. There is a considerable amount of building work being done in Dublin at present by Northern firms. In several cases the firms referred to have taken large plots of ground in the suburbs, and have started erecting residential houses by the score, according to the system which they have pursued in Belfast. If this continues for a few years, possibly the high rents which are such an unpleasant feature of life in Dublin may be somewhat reduced. Within the last ten years upwards of 4,000 houses have been erected in and around Dublin, but the demand was so much in excess of the supply that rents are, if anything, dearer than they were a decade back. If building continues at the present rate the increase for the next ten years will probably be nearer 8,000 than 4,000.—*Northern Whig.*

HOSPITAL, KINGSWOOD, NEAR BRISTOL.—A new hospital is to be erected at Kingswood Hill, from plans prepared by Mr. F. Bligh Bond. The building will have beds for about fifty, and will cost about 20,000l.

HOTEL, SOUTH SHIELDS.—The new West End Hotel, Stanhope-road, South Shields, was recently opened. The hotel is lighted throughout with electricity. Mr. T. E. Davidson was the architect.

VARIETY THEATRE, LINCOLN.—The Masonic Hall, Lincoln, is about to be adapted as a variety theatre under the title of "The Empire Theatre of Varieties and Hippodrome." The architects are Messrs. W. Mortimer & Son.

CATHOLIC SCHOOL, ABERDEEN.—A new school building is in course of erection in Summer-street, Aberdeen, for the Roman Catholic authorities. On the ground floor there is a large hall, which may be used as a gymnasium or otherwise. Immediately above are two rooms partitioned off by a sliding glass screen. On the upper floor a similar arrangement has been provided for. The architect is Mr. R. G. Wilson.

DECORATIVE ART EXHIBITION IN ITALY.—An International Exhibition of Modern Decorative Art is to be held at Turin from April to November next year. The movement is under the patronage of the King of Italy.

SANITARY AND ENGINEERING NEWS.

BRIDGE, ST. PHILIP'S, BRISTOL.—A new foot-bridge has been placed across the feeder from Silverthorne-lane, St. Philip's. The cost of land, bridge, and approaches has been about 4,000l. The contract was let to Mr. Krauss, and the bridge has been constructed from plans prepared by the City Engineer, Mr. Yabbicom.

FARINGDON (BERKS) WATER SUPPLY.—These works have recently been completed, at a cost of about 5,700l., from plans prepared by Mr. Geo. Winship, Assoc. M. Inst. C.E., Oxford, and comprise a pumping scheme, with deep well pumps and oil engines, both in duplicate, and service reservoir. The contractors were, for reservoir engine-house, mains, &c., Mr. H. Roberts, West Bromwich; for engines and pumps, Messrs. Hornsby & Sons, Grantham.

FOREIGN.

FRANCE.—M. Jean Boucher, the sculptor of the fine group "Antique et Moderne," which was illustrated in the *Builder* two years ago, has received the Prix National of the Salon in respect of this work, the marble edition of which is in this year's Salon. In the Section of Architecture, travelling studentships have been awarded to M. Faure-Dugarrie for his "Monument aux héros de l'Indépendance," and to M. Paquet for his "Projet d'École de l'Art Décoratif."—At the Ecole des Beaux-Arts a lady student, Mlle. Rondenay, has obtained the Huguier prize, a circumstance which justifies the action of the authorities in admitting women to the schools.—The remains of President Faure have been transferred to the monument in Père Lachaise, designed by M. Saint-Marceaux, which bears a bronze figure of the late President on a pedestal of grey marble, partly draped by a French and a Russian flag, folds of both of which are grasped.—The decoration of the larger Art Palace on the Champs Elysées is to be completed shortly by the addition of two quadrigas in hammered copper, which have been commissioned by the Government from M. Reipon.—The Municipal Council of Paris has decided on the rebuilding of the ancient church of St. Antoine des Quinze-Vingts, at the estimated cost of about 80,000 francs.—The Council of Paris has also under consideration a scheme for the acquisition of the celebrated Hôtel of Mme. de Paiva in the Champs Elysées, in order to transfer to it the mairie of the Eighth Arrondissement, at present installed in an old and inconvenient house in the Rue d'Anjou. The Paiva Hôtel is well known for its artistic collections, especially the decorative paintings by Baudry.—M. Ulysse Gravigny, architect to the Administration Centrale at the Prefecture of the Seine, has died, after a long illness, at the age of fifty-seven. He was a pupil of Constant-Dufeux, and had collaborated on the greater part of the works of architecture carried out for the municipality during twenty years. He undertook last year the pavilion on the Cours la Reine and the arrangement of the Municipal Exhibition. He was Chevalier of the Legion of Honour.—We have to record the death, at the age of fifty, of the sculptor André Massoule, whose fine monument to Jean Macé formed a central feature in the sculpture court of the Salon this year, and is to be erected in Paris on the Place Armand Carrel. Massoule was a pupil of M. Salmon and M. Cavelier. He had obtained various medals at successive Salons, including the Gold Medal in 1900. The statue of Mme. de Sevigné which decorates the house of the Legion of Honour at St. Denis is by his hand, also the group of "Aurora et la Rosée," much remarked in the Salon of 1896; also the Carnot monument at Chalons-sur-Marne, and a decorative figure on the Pont Alexandre III.

AUSTRALIA.—The Institute of Architects of New South Wales have sent us (rather late in the day) their programme of meetings for next session, several of which however are now over; but it may be of interest to give the list of meetings and papers, as showing what subjects are interesting this Colonial Architectural Society:—March 6, inaugural meeting, President's address; March 28, business meeting; April 17, ordinary meeting, paper by A. F. Evans, Associate, on "Quantity Surveying in Australia"; May 23, business meeting, nomination and election of members, followed by ordinary meeting, two or three short papers on the subject of "Decoration as Applied to Architecture"; June 20, ordinary meeting, paper by Cyril Blacket, Fellow, entitled "A Building Book of Standards," papers on "The Institute of Australasian Architects"; July 18, business meeting, nomination and election of members, followed by ordinary meeting, papers on "The Electric Lighting of Houses"; August 22, ordinary meeting, paper on "Theatre Construction," by R. Charles Backhouse; September 10, business meeting, followed by ordinary meeting, two or three short papers on the subject of "The Improvement of Sydney"; and October 17, annual general meeting.

OFFICIAL APPOINTMENT, LOCAL GOVERNMENT BOARD.—It is announced that, consequent upon the retirement of Mr. P. Gordon Smith, the President has appointed Mr. Brook Taylor Kitchin to be Architect to the Local Government Board.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The address of the Institution of Junior Engineers, on and after July 1, will be 39, Victoria-street, Westminster, rooms having been taken there on the first floor for offices, reading-room, library, &c. —Messrs. Walter J. Pearce, of Manchester, workers in stained glass, have appointed Mr. Leonard Laskey, to Newman-street, London, as their representative. —Mr. James C. Gibson, lock manufacturer, Wolverhampton, has appointed Mr. W. Harvey Stringer, of 9, Southampton-row, Holborn, as his London agent.

ELECTRIC LIGHTING FOR HACKNEY.—On the 19th inst. the members of the Hackney Borough Council paid a visit of inspection to the works now in course of construction at Millfields-road, Clapton, from which a supply of electricity is to be generated for the lighting of the streets, houses, and shops of Hackney. The engines will be worked from two boiler houses, in one of which the dust and refuse of the borough will be consumed; the other set of boilers will be worked by coal. The party was shown over the buildings by Mr. Robert Hammond, the Council's electrical engineer.

HOUSING QUESTION, BIRMINGHAM.—The City Council of Birmingham devoted a sitting recently to discussing problems affecting the housing of the poorer classes, and rejected a scheme, on which the Health Committee had spent much time, to erect 600 workmen's dwellings on a site on the outskirts of the city. The arguments against the proposal were chiefly the distance of the proposed site, and the objection to dealing with the housing question piecemeal, and several councillors advocated provision of cheap flats in the centre of the city.

SOCIETY FOR PROMOTING THE BUILDING OF CHURCHES AND CHAPELS.—This Society held its usual monthly meeting on Thursday, the 20th inst., at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Hon. Richard Strutt in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Great Bard, St. John the Evangelist, Essex, 150*l.* for the first portion; Hornsey, St. Luke, Middlesex, 75*l.* for the first portion; and Palfrey, St. Mary and All Saints, Walsall, Staffs, 1,000*l.*; towards rebuilding the Church of St. Mary, Swaffham Prior, near Cambridge, 100*l.*; and towards enlarging the Church of St. Faith, Stoke Newington, Middlesex, 25*l.* A grant was also made from the special Mission Buildings Fund towards building St. Luke's Mission Church, Leyton, Essex, 20*l.* The following grants were also paid for works completed.—Knowle, St. Martin, Bristol, 500*l.* on account of a grant of 1,000*l.*; New Found Pool, St. Augustine, Leicester, 100*l.* (making in all 600*l.*); on account of a grant of 1,000*l.*; Hammersmith, Holy Innocents, Middlesex, 125*l.*; Gillingham, St. Barnabas, New Brighton, Kent, 50*l.*, balance of a grant of 150*l.*; Clapham Rise, St. John, Surrey, 15*l.*; and Arlesey, St. Andrew, near Hitchin, 25*l.* In addition to this, the sum of 122*l.* was paid towards the repairs of fourteen churches from trust funds held by this Society. The grants made at this meeting have exhausted the funds at the disposal of the Committee, and they appeal for subscriptions and donations to enable the Committee to meet more adequately the many pressing applications for aid, which are being continually brought before them.

ITALIAN MARBLE AND ALABASTER.—Reporting on the trade and commerce of Italy for the year 1900, the British Consul-General states that, as compared with 1899, there was a falling off in the marble and alabaster production, due to decreased exportation to the United Kingdom and the United States, which are the chief purchasers. The figures for 1900 were, nevertheless, above the average, the quantities for the last five years having been: 1896, 1,340,372 cwts.; 1897, 1,236,182 cwts.; 1898, 1,342,562 cwts.; 1899, 1,617,440 cwts.; 1900, 1,430,598 cwts.

YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.—The monthly meeting of the Yorkshire Federation of Building Trade Employers was held at the Savings Bank, Scarborough, recently. Mr. Longin, its president (Sheffield), occupied the chair, and the members of the executive present included Councillor Mansfield (York), Messrs. Good, Umphey, Townsley, Goat, and Hebblethwaite (all of Hull), Thompson (Dewsbury), Dawson (Huddersfield), Mavson (Bradford), Judge (Wakefield), Lyon (Malton), Kennard and Gardham (Bridlington), A. W. St. Clair (Scarborough), and G. Sinfild (Hull), newly appointed secretary. The Scarborough Association was represented by Mr. A. W. St. Clair (president), Councillor Bland (ex-president), and Messrs. W. Malton, A. Moore, T. Garam, T. E. Jowsey, R. Hunter, J. Atkinson, A. Bell, W. Coultas, S. Manson, and R. H. Carr (hon. secretary). During the last seven months the Federation has suffered the loss by death of both presidents (Mr. J. Spink, Sheffield) and secretary (The Rev. H. Howland). It was reported that the master builder of Malton had joined the Federation, and that steps were being taken to form a branch there. The meeting lasted nearly four hours, the principal question for discussion being the Bradford dispute. The representatives from Bradford explained the position of the dispute with the masons and joiners, and reported that the Mayor had tried his best to

settle the various questions in dispute, and that they were exceedingly sorry that he had not been successful. The meeting resolved unanimously to support the Bradford and Shipley employers by every legitimate means during the dispute.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the following sanitary officers: Dr. W. Collingridge, medical officer of health, City of London; Mr. A. H. Walker, sanitary inspector in St. Pancras; Mr. G. A. Smith, sanitary inspector in Hampstead; Messrs. G. F. Clark and G. J. Gregory, sanitary inspectors in Holborn; Mr. C. T. Bacon, sanitary inspector in Islington; Messrs. J. R. Bagshaw, E. J. Bennett, G. W. McQuinn, and A. A. Lindon, and Miss G. A. Looker, sanitary inspectors in Kensington; Miss G. D. Bevan, sanitary inspector in Camberwell.

SOCIETY OF ARTS.—The annual general meeting of the Society of Arts was held on Wednesday, the 26th inst., at the Society's house in the Adelphi. Fifty-seven members were elected, this making the total elected during the present session of the Society 376. The Report of the Council was read by the Secretary. It summarised the proceedings of the Society during the last twelve months, giving an account of the various papers which had been read, and the work of the Society's different Committees. Amongst other matters referred to was the resignation of the Presidency of the Society by the King, who, as Prince of Wales, held the office from 1863. His Majesty, however, while ceasing to be President has become Patron of the Society. During the year a committee of the Society has produced an important report on Leather for Bookbinding, which will be published in a few days. This committee has determined the causes which produce decay in modern leather bookbindings, and recommends a method of manufacture which ought to be free from the usual defects. Over 15,000 candidates entered for the Society's annual examinations, the results of which are now in course of issue. At the conclusion of the reading of the Report the result of the ballot for the election of the new Council was announced, the President for the coming year being Sir Frederick Bramwell, Bart., F.R.S.

CAPITAL AND LABOUR.

THE BUILDING TRADE DISPUTE IN BRADFORD.—Another meeting of the master and operative joiners was held at the Town Hall, Bradford, on the 22nd inst., the Mayor (Mr. W. C. Lupton) presiding. A long discussion on the point at issue took place, but neither party being willing to consent to any modification of its terms, the meeting was concluded without any definite results being arrived at. The negotiations, however, have not been entirely broken off, and the Mayor has expressed himself as being still hopeful of bringing about a settlement.

LEGAL.

BUILDER'S SUCCESSFUL APPEAL.

The case of Matthews v. Strachan came before a Divisional Court of King's Bench, composed of Justices Ridley and Bigham, on the 20th inst., on the appeal of Mr. Matthews from a conviction of Justices under Section 25 of the Public Health Act, 1875. It appeared from the special case which had been stated that an information had been laid by the respondent Strachan, the Clerk to the Harrow Urban District Council, against the appellant for erecting a house in Lyon-road, Harrow, without constructing such covered drains thereto as on the report of the Council's Surveyor appeared to the Council necessary for the effectual drainage of the house contrary to Section 25 of the Public Health Act, 1875. The Council had laid two sewers in Lyon-road North within 100 ft. of the site of the house, one being for the reception and conveyance of surface water only, and the other for the conveyance of sewage only. Before erecting the house the appellant deposited plans in accordance with the bye-laws under Section 157 of the Public Health Act, 1875. The Council approved the appellant's plans, subject to the requirements contained in the report of their Surveyor as to the requirements for the effectual drainage of the house. The next day the respondent wrote to the appellant enclosing a copy of the Surveyor's report, and calling upon the appellant to lay the drains in accordance with the report. The appellant did not lay two drains as required by the notice and report, but one only in the manner shown in his deposited plans. The Surveyor for the Council before the Justices admitted that the drain laid by the appellant would have been effectual if there had been only one sewer in Lyon-road, and that his reason for reporting that separate drains ought to be laid—one for sewage and the other for surface water—was that it was desirable that sewage only should be discharged into the sewage sewer and surface water only into the surface-water sewer, and that there were separate sewers for sewage and for surface water in Lyon-road. The Justices held that they had no jurisdiction to question the reasonableness of the requirements for the effectual drainage of the house, and convicted the appellant.

At the conclusion of the arguments of counsel that the Justices allowed the appeal and quashed the conviction, holding that Section 25 of the Act only empowered the Local Authority to take into consideration certain matters, viz., the size, material, level, and fall, in order to satisfy themselves whether the drain proposed was effectual for draining the house.

Mr. McCall, K.C., and Mr. A. F. Jenkin appeared for the appellant, and Mr. Macmorran, K.C., and Mr. S. G. Lushington for the respondent.

EMPLOYERS' LIABILITY ACT.

'FACING BOARDS' ON A SPINDLE MACHINE—A QUESTION OF A FOREMAN'S DUTY.

AT Brompton County Court on Monday, before Judge Stonor and a jury, William Ernest Parkes, described as a machinist's improver, 43, Whitecliff-road, Lavender Hill, S.W., suing through his father, William Robert Parkes, sought to recover damages under the Employers' Liability Act, from Messrs. Allen & Norris, builders, &c., Ashcombe House, Wandsworth Bridge-road, S.W., the claim being in respect of personal injuries sustained by the plaintiff, owing, it was said, to negligence on the part of the defendants or their servants.

Mr. W. M. Thompson, counsel, appeared for the plaintiff, and Mr. Kisch, counsel, defended.

Mr. Thompson explained that the plaintiff, who was twenty years of age, entered the employment of the defendants last October as a machinist's improver, receiving 7*d.* an hour. On January 14 the plaintiff was working a vertical spindle machine which had two knives, and was worked at 4,000 revolutions a minute. The plaintiff was told by the foreman to hevel some meeting sash rails, which he had almost completed the work, one of the rails having a large knot near the end, first coming in contact with the knives, suddenly flew out, causing the knotty end to get in between the "fences," and in a second all four fingers of the plaintiff's left hand were off.

The plaintiff bore out his counsel's opening statement. He added that, just before the accident, he asked the foreman, Page, whether he ought to put on a "facing board" as a protection, but the foreman said that he should not do so, as they never used such boards for working meeting rails. Since the accident he had only been able to earn 4½*d.* per hour.

Cross-examined: It was not a fact that he was engaged by the defendants as a fully-qualified machinist. He added that, just before the accident, he asked the foreman, Page, whether he ought to put on a "facing board" as a protection, but the foreman said that he should not do so, as they never used such boards for working meeting rails. Since the accident he had only been able to earn 4½*d.* per hour.

Mr. William Robert Parkes, the plaintiff's father, a carpenter and machinist, maintained that the spindle machine being so "complex and dangerous," was the last for an improver to be put to, and that it should always have a facing board.

Mr. Cyril F. R. Johnston, an Inspector under the Factory Acts, said he considered that a spindle machine ought not to be worked without a fence or guard of some kind.

The Judge: Do you think that the machine could be worked safely without a facing-board? Witness: It might be, but I certainly think that it ought to have a fence or guard.

For the defendant, Mr. Thomas S. Page, 78, Chaybrook-road, S.W., the foreman referred to by the plaintiff, denied that he had ever told Parkes that it was unnecessary to use a facing-board for bevelling work. It was not true that plaintiff asked him, just before the accident, whether he ought to use a facing-board. He did not consider it a foreman's duty to see that the men under him used a facing-board or guard on their machines. The adjusting of a machine, and the question of using a knotty piece of wood was left to the men's own discretion. There were plenty of pieces of wood lying about which the plaintiff might have used as facing-boards.

Mr. Arthur Foales, manager of the defendant's Joinery department, said that when he engaged the plaintiff he father said that the young fellow had been working four and a half years as a machinist. The word "improver" was not used. He did not think it a foreman's duty to tell the men to put facing-boards on their machines.

Mr. William S. Page, a foreman machinist, said that he did not think the facing board was much protection on a spindle machine. He considered that the foreman's duty was to let the men use their own discretion as to the use of the facing board.

Mr. J. Davis, M.R.C.S., &c., gave evidence as to the injuries.

Mr. Richard Goodfellow, manager to Messrs. Jay, timber merchants, said that he had had a good deal of experience with wood working machinery, and he considered that it was a foreman's duty to leave to the men the question of using a facing board. The jury found (1) that a facing board was a necessary and proper precaution in connection with the work in question; (2) that the foreman, Page, actually told the plaintiff on the day of the accident not to use the facing board; (3) that the foreman did not tell the plaintiff to use the board or not at his discretion; (4) that the foreman was guilty of negligence as to the performance of his duty in so doing; (5) that the plaintiff did not know the full

risk of not using the facing board; (6) that he did not willingly accept the risk; (7) that the plaintiff incurred his injuries through the misdirection of the foreman. This was a verdict for the plaintiff, in whose favour the jury assessed the damages at 200l.

His Honour gave judgment accordingly, and allowed full costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

3,545.—AN INSULATING CONDUCTOR: M. Frank.—An insulating conductor for electrical purposes consists of spun or other waste silk fibre which has been separated from a mixture of vegetable and silk fibres by means of a carbonising process whereby hydrochloric acid destroys the vegetable fibre that is subsequently removed.

3,584.—A CONTRIVANCE FOR KILNS: J. W. Briggs.—The inventor seeks to utilise the waste heat in brick and tile kilns after the "Scott" or "Dutch" kind, the flues of the kiln with glass tubes or pipes which join the chimneys of one kiln and the inside of another kiln and causes the flues to discharge on the floor of the kiln in which the waste heat is to be utilised; he also provides supplementary flues that extend from some of the chimneys into a main shaft, so as to set up a draught.

3,588.—A TEST FOR ELECTRICAL PURPOSES: F. de Mare.—A change in the colour of a liquid at electrodes will indicate a direction of current; the contrivance embodies a tube of boron or other insulating material, near one end of which are side openings covered with glass, together with a partition that lies between the ends; the ends and side pieces are closed with plugs, upon two of which are mounted electrodes; different lengths of liquid resistance between the electrodes are to be obtained by partly filling the tube (which can be used with either end uppermost) with liquid; the electrodes may be fashioned as wire forks, and two parallel glass tubes joined at the ends may be substituted for the partition, set lengthwise, in glass tubes.

3,590.—WATER-WASTE APPLIANCES: F. Wangelin.—In the case of ball-valves, the screwing of a disc in either the one or the other direction will serve to control the stroke of the plug as the pressures vary in amount, and a screwed stem or a screw in a lug upon the float area is used for further adjustments; a loop upon the inner end of a lever carries a glass bell, from the crown of which the stand-pipe is also hung in a loop; the lower end of the pipe moves between guide-rods, and is weighted. The pipe will adapt itself as an overflow when the glass bell is not used.

3,611.—FACING OF TILES, PLATES, AND SLABS: I. H. Storey and W. E. McCalla.—Enamel which contains sawdust or some such combustible substance is applied to the backs of the tiles or plates (for ceilings, floors, walls, sinks, baths, &c.) to render them roughened or pitted to make a key with the cement. The enamel becomes fixed as the sawdust is consumed, when the tile or slab is fired. In the case of tiles, &c., of glass or earthenware the sawdust may be pressed into the soft material during the process of moulding. Coarse canvas, with or without an enamel filling, may be adopted instead of sawdust.

3,626.—A METHOD OF FIXING HANDLES IN TOOLS: F. H. Sohn and F. Thiel.—A wedge having shoulders and sharp edges is devised for fixing the handle of a hammer, an axe, or similar tool. Nails are driven into two holes cut in opposite directions in the wedge; the wedge and nails are forced further together, so that the nail points shall be turned up so as to prevent them from dropping out.

3,632.—A TOOL FOR USE WITH RED LEAD: W. Johnson.—The invention relates to the use of red lead in making water-tight and other joints. In the cylinder that holds the red lead is a piston which is loosely connected to a screw passed through a screwed cap, and having a handle. A cock controls the flow of the red lead through a nozzle which, being threaded, can be screwed into a tapped hole in a plate that has been riveted in its proper position, whilst a screwed plug closes the hole when the red lead has been forced behind the plate.

3,669.—A VENEER-CUTTING MACHINE: F. Kraus.—Guides for the knife-bar are affixed to standards, and a link joins the knife to the top of the framing so that it shall make a drawing cut as it travels sideways when the cranks move it downwards; a contact-bar, which may be shifted for regulating the thickness of the board, has its carrier pivoted on to the knife-carrier, and remains parallel to the knife. Levers, to be adjusted with screws and pivoted on to eyes upon the knife-carrier, adjust the place of the contact-bar, and if a knot, &c., comes against the bar the levers will give way by means of springs that are placed between the sliding portions of the machine.

3,671.—A PRESS FOR THIN VENEERS: F. Gröning.—Each of the stamps in the press has a foot in its middle which a spring will force outwards, which means the pressure can be freely employed at the centre so as to press out blisters, ridges, and other inequalities. Springs carry the table, and there are guiding bars for the stamps, which are worked with screws.

3,685.—A LIFTING-SLING: M. Enright.—A frame has recesses into which are slipped the eyes at the ends of the rope; when the load has been laid upon the sling the height is passed underneath the hooks, and then the lifting-hook is brought into engagement; the contrivance can be used with a chain.

3,717.—AN APPLIANCE FOR DRAIN PIPES AND TRAPS: W. P. Little.—By way of interposing an obstacle against the return of the soil, the passage of rats, and so on, the inventor fits a loosely-hinged flap which bangs within a cross-cut of the trap or pipe and makes it fast with a cover.

3,739.—A FLUSHING APPARATUS: H. Samsy.—For starting the main flush a bell is lifted or depressed in the customary manner. A siphon forms a communication between a well at the base of the bell and the pipe, and a pipe from the crown of the siphon is turned into a small vessel or container within the tank that holds water which will serve for an after-flush.

3,749.—ARTICLES OF ARTIFICIAL STONE: A. C. F. P. Thaarup and S. F. A. Dohlmann.—The inventors provide for the making of plaques, tiles, and similar goods of artificial stone without employing pressure or heat. They form an admixture of magnesium-chloride solution, magnesite, gravel or sand, water, and a colouring matter which is first exposed to become set in moulded shapes and is then air-dried. For objects having smooth surfaces they use glass or glass-lined moulds. Designs, pictures, and so on that have been made upon the surface of the glass and dried will, the inventors claim, become transferred on to the surface of the next cast article, the picture being made with a mixture of the above-named ingredients, the sand excepted.

3,765.—A GUARD FOR CIRCULAR SAWS: W. T. Ford & J. Pickford (Ford & Pickford).—To the usual radial arm is pivoted a hood, made of perforated iron or open wirework, that can be folded backwards so as to point upwards. A vertical pillar carries the radial arm, which can be turned round about it, or in another form the arm may be lifted or lowered upon the pillar.

3,797.—SWIVELS FOR CRANE-CHAINS, &c.: T. P. Hovell.—A link, a guide-washer, an eye-bolt, and a spring combined constitute the swivel. A band may be taken over a widening of the end of the link, and a hook-bolt may replace the eye.

3,808.—APPLIANCES FOR USE WITH WATER-WHEELS: F. Turina.—The wheel-shaft is set in blocks which slide in guides and are secured to the ends of a rope or chain carried over rolls; a weight heavier than the wheel, together with its bearings and shaft, hangs above from the chain; a similar chain or rope is attached to the blocks, and carries a weight which, when partly immersed in the water, will just counterbalance the parts so as to lift or lower automatically the wheel concurrently with a change in the water level. For lifting the wheel out of action the latter weight is taken away. Provision is made for the replacement of the weight by means of a roller-guided chain or cord, and also for altering the gearing at the remoter end of the wheel-shaft, to meet variations in the relative positions of the wheel.

3,812.—FITTING FOR KILNS FOR CALCINING CEMENT, &c.: C. Garman.—The discharge fittings, adapted for rotary furnaces or kilns, are intended to obviate the admission of air. A set of pockets having oppositely-hinged doors both above and below is disposed around the lower portion of the periphery of the inclined rotating cylinder, and as the cylinder is revolved the rollers of the doors will run upon their guides. Every door drops open as it reaches a gap, whilst the door at the top becomes closed before the door at the bottom is opened; so no air can enter, since the two doors are never open at the same time, and the material will fall into the pocket, whence it is discharged over the gap.

3,868.—A CONTRIVANCE FOR USE WITH TRAPS FOR CLOSETS AND DRAINS: J. Bruce.—A rectangular opening is made in the crown of the siphon-trap, three of the sides of the opening being undercut and the fourth being left opened so that it may be closed, when it is desired, with a plate which slides for that purpose.

3,882.—TIP-VAN AND WAGGONS: R. Knill and E. Knill.—From the middle of the bolt by which the body of the wagon is hinged to the under-carriage is suspended a curved rod which is joined to the back of the body with a spring-rod, and to the back of the front-carriage with a jointed rod; when a bar is liberated from its hooks the tipping action is set in motion with springs, whilst other springs act so as to restrain the fall of the body of the van or wagon.

3,992.—MEANS OF MEASURING ELECTRICITY: A. G. Electricitätswerke vorm. O. L. Kummer & Co.—The axle of a volt-meter is sustained between pivots and carries a pointer, together with an adjustable sleeve equipped with vanes that will move from between fixed metal plates towards curved metal rods. The plates, vanes, and rods are arranged at different angles in order that the evenness of graduation of the scale traversed by the pointer may be increased. The vanes and plates are connected to the terminals and the rods to the other terminal, and in order that the measuring parts may not be exposed to an excess of electrical pressure an adjustable discharger is set in connexion with the terminals.

3,994.—BUTT-AND-FLANGE JOINTS: J. A. Atton.

—For steel and wrought-metal flanged pipes a yielding or jointing strip of metal is electrolytically deposited upon the flanges. Around the curved flange is deposited copper or similar metal in the shape of a ring, and the pipes can be drawn to one another by means of loosely-fitting rings that encompass the flanges.

MEETINGS.

FRIDAY, JUNE 28.

Carpenters' Company.—Carpentry Examination, Practical Work, 155, Great Titchfield-street. All day.

SATURDAY, JUNE 29.

Architectural Association.—Visit to Colney Chape Convect, St. Albans.
Carpenters' Company.—Carpentry Examination, viva voce, Carpenters' Hall, 12 noon.

WEDNESDAY, JULY 3.

Royal Archeological Institute.—(1) Mr. F. G. Hilton Price on "Clay Tobacco Pipes of the Seventeenth Century"; (2) Mr. J. C. Stebbing on "Early Churches of Asturias"; (3) Professor B. Lewis, M.A., F.S.A., on "The Antiquities of Toulouse." 4 p.m.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

SATURDAY, JULY 6.

Institution of Junior Engineers.—Visit to the Staines Reservoirs Works, under the guidance of the joint engineers, Messrs. Walter Hunter and K. E. Middleton, M.A. Inst. C.E. Train leaves Waterloo (South-Western Railway) at 1.25 p.m.
Northern Architectural Association.—Annual excursion, Edinburgh.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Table listing property sales with columns for location, details, and price. Includes entries like 'Hinton to—By MARK JEANS (at Swindon)', 'Clapham Park—Rodenhurst-rd., 74 plots of freehold building land (in lots)', 'Printed, Sussex—Two houses, cottage, home-stand, and 8a. 31. 27 p. c.', etc.

Table listing property listings with columns for location (e.g., Camden Town, Kentish Town), area, and price. Includes entries like 'Camden Town—26, High-st., & 9, Little King-st., u.t. 271 yrs., g.r. 547, r. 904.' and 'Kentish Town—1 to 5, Hamrod-grove, u.t. 181 yrs., g.r. 271, r. 904.'

Table listing property listings with columns for location (e.g., Hammersmith, Kensington, City of London), area, and price. Includes entries like 'Hammersmith—16 to 24 (even), 25, 27, 29, 33 to 39 (odd), Stenfordale-rd., u.t. 76 yrs., g.r. 964, r. 454.' and 'Kensington—23, Bolingbroke-rd., u.t. 92 yrs., g.r. 87, r. 432.'

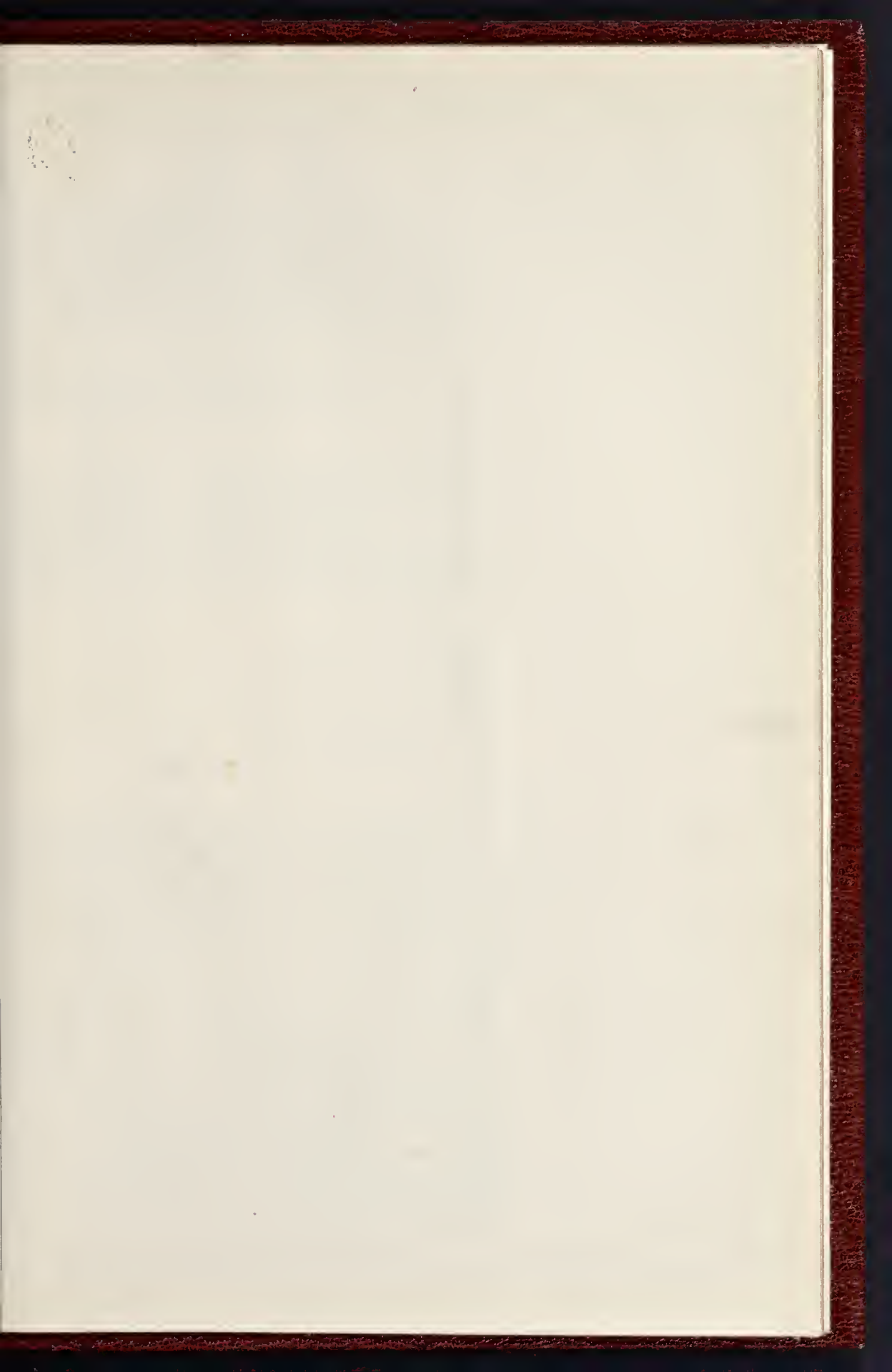
Table listing property listings with columns for location (e.g., Islington, Camden Town, Folkestone), area, and price. Includes entries like 'Islington—7, Noel-st., f. r. 504.' and 'Camden Town—18, Rochester-ter., u.t. 421 yrs., g.r. 61, r. 601.'

CONTRACTIONS USED IN THESE LISTS.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; y.s. for years; s.t. for street; r.f. for road; sq. ft. for square ft. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

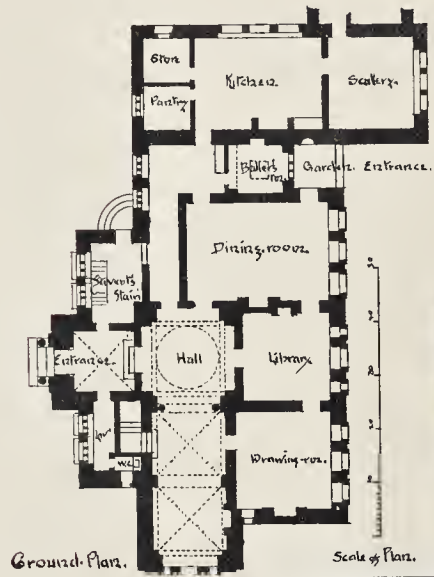
Table listing prices for various materials such as Hard Stocks, Lumber, and Bricks. Includes entries like 'Hard Stocks — 1 1/4 0 per 1,000 alongside, in river.' and 'Lumber — 2 11 0 per 1,000 alongside, in river.'

[See also page 615.]



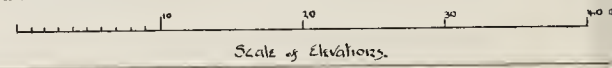
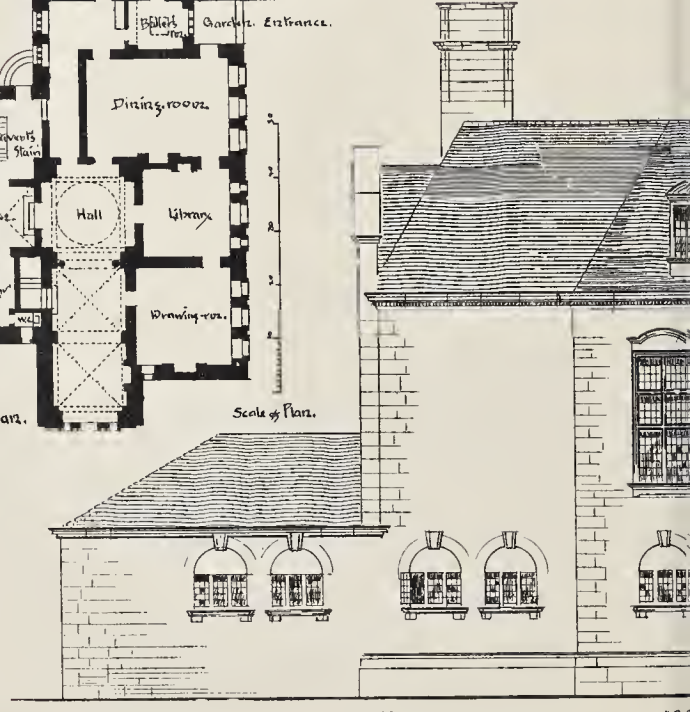


Garden. front.



Ground Plan.

Scale of Plan.



Scale of Elevations.

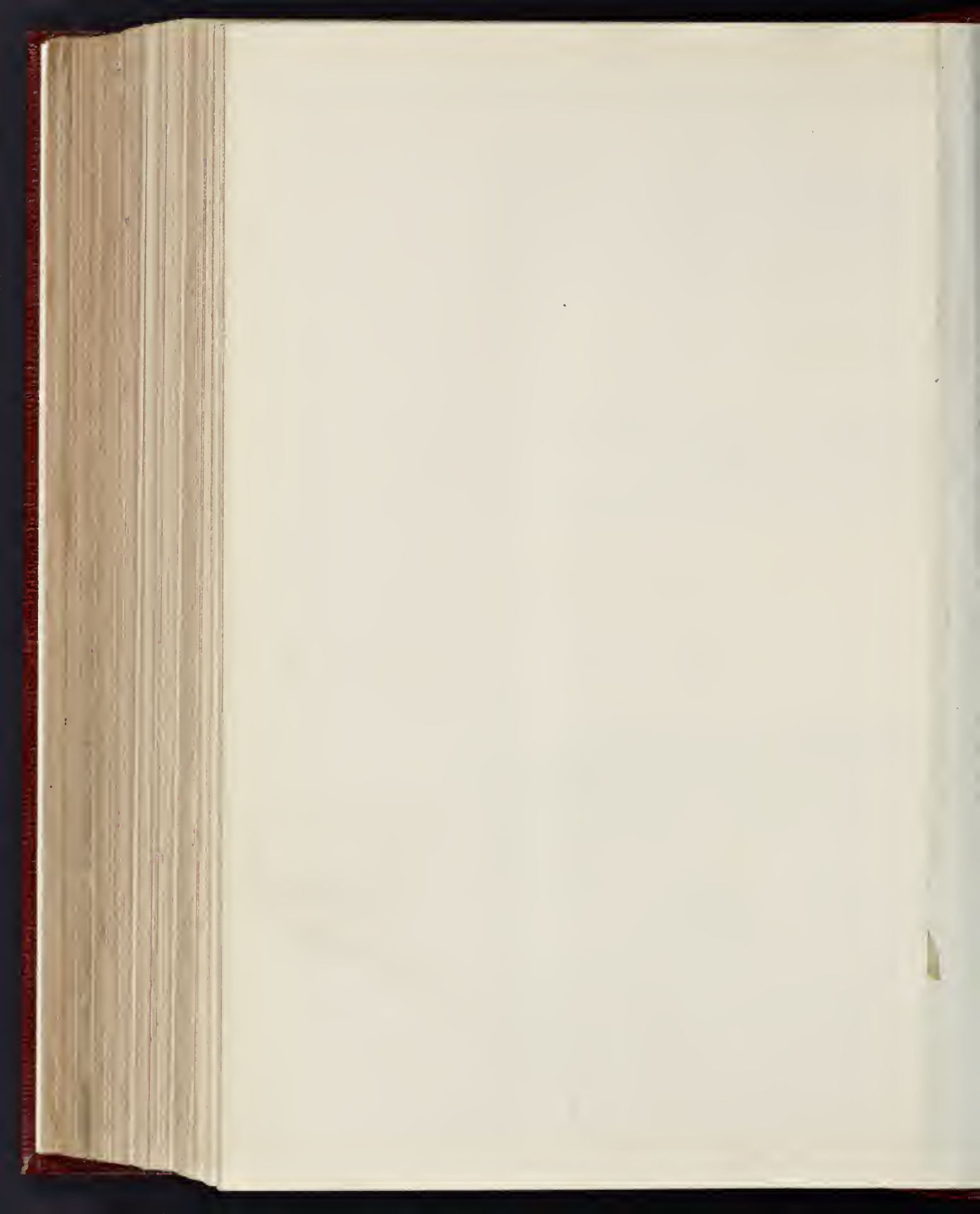


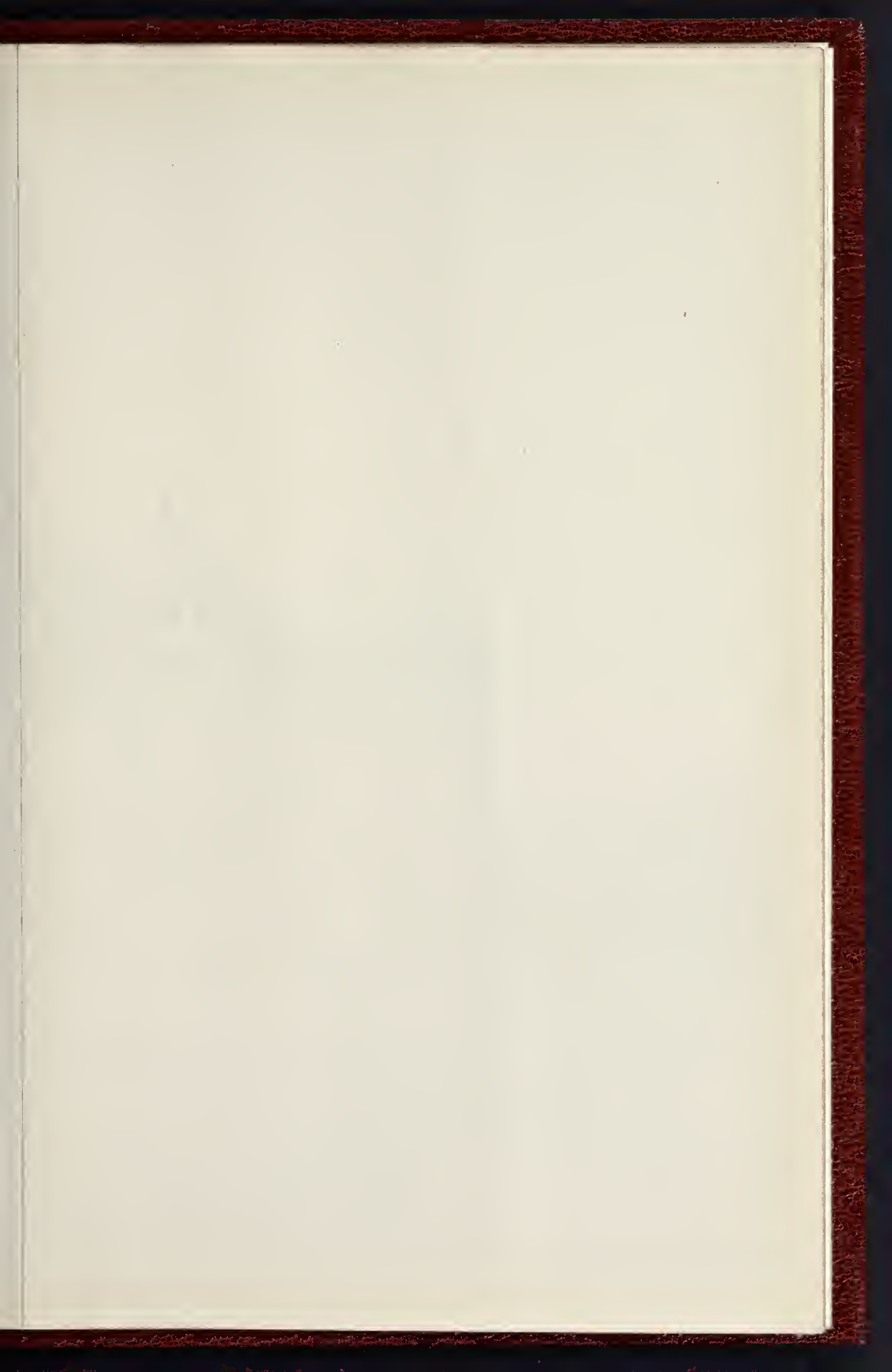
A Study for
A Small. Country
House.



Entrance Front

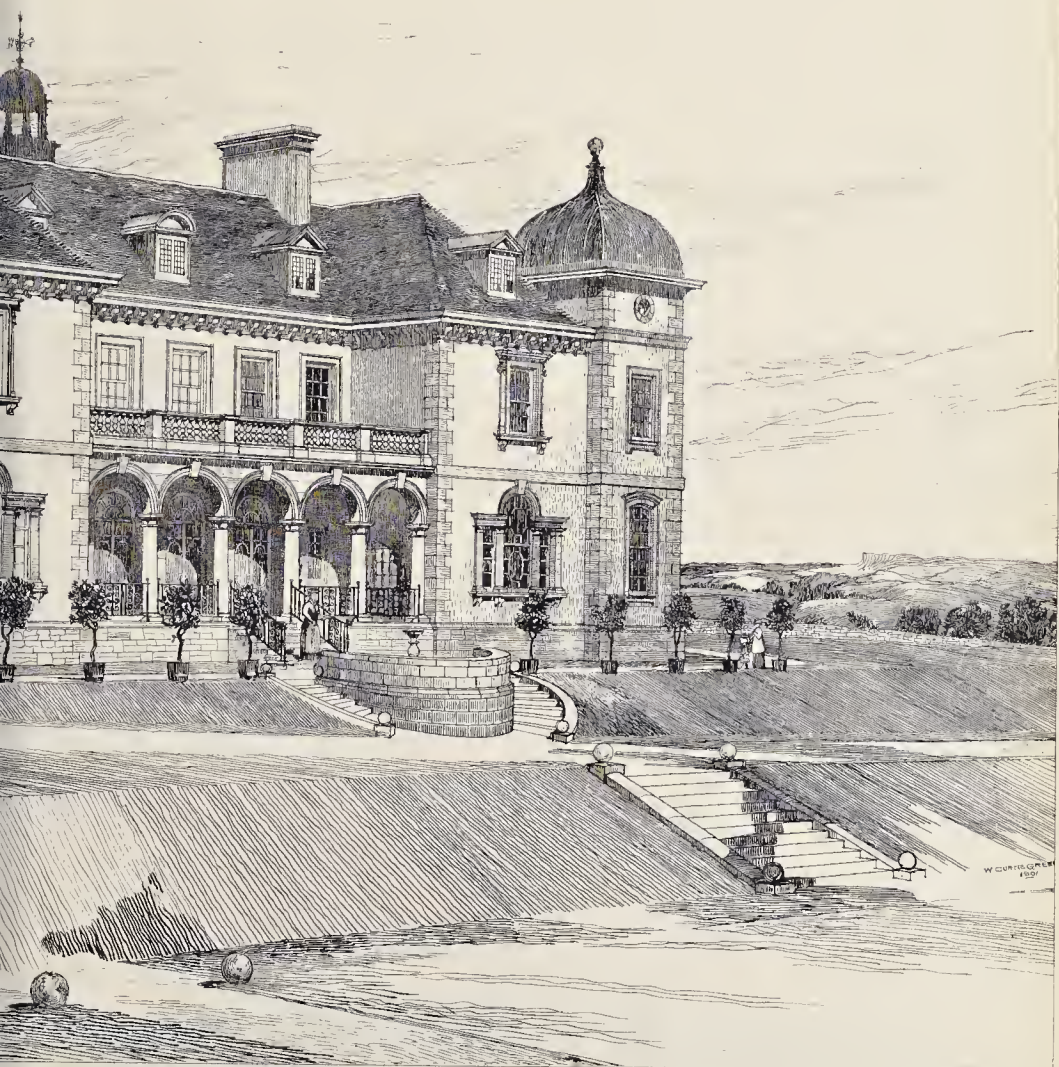
J. Henry Selley





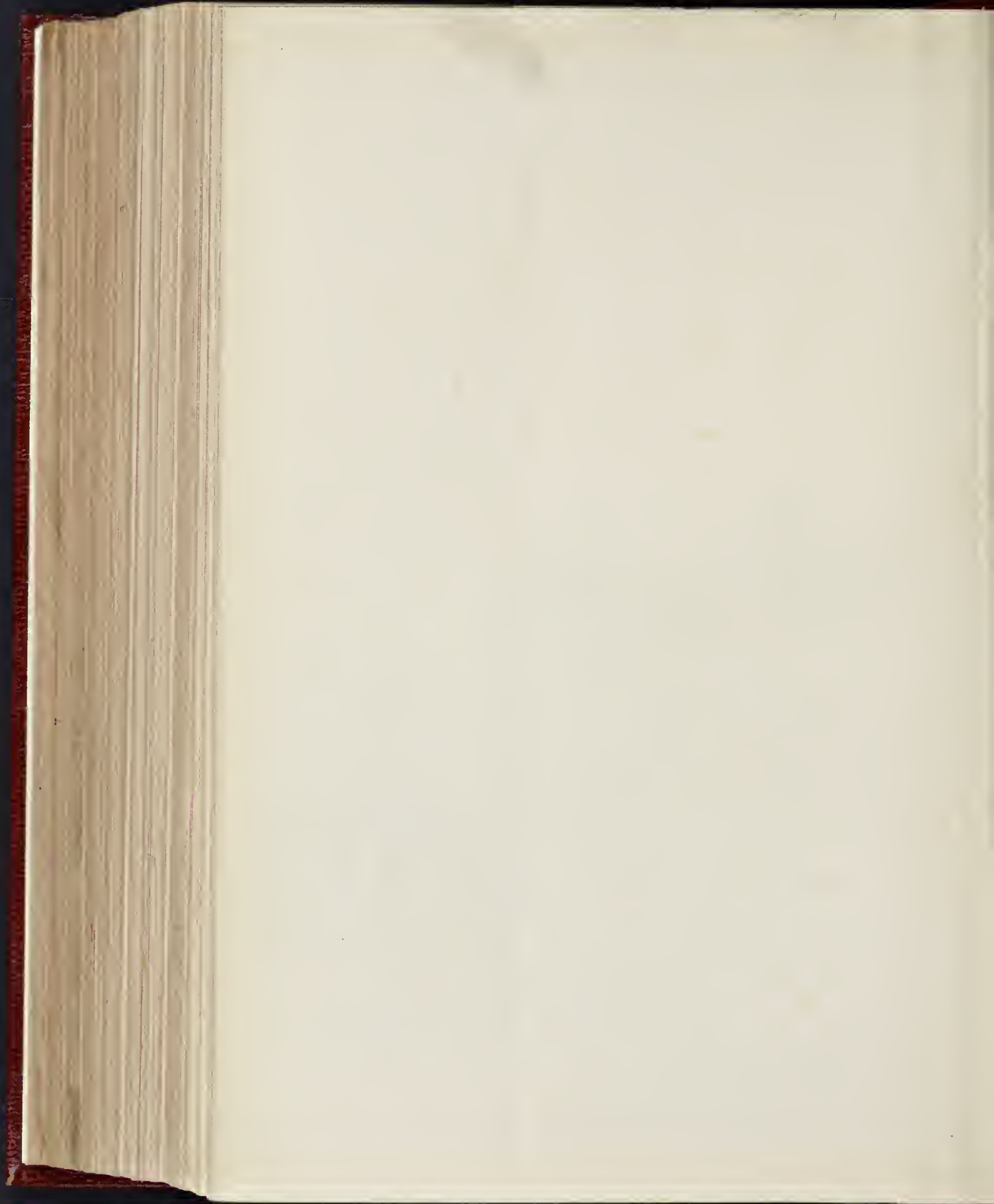


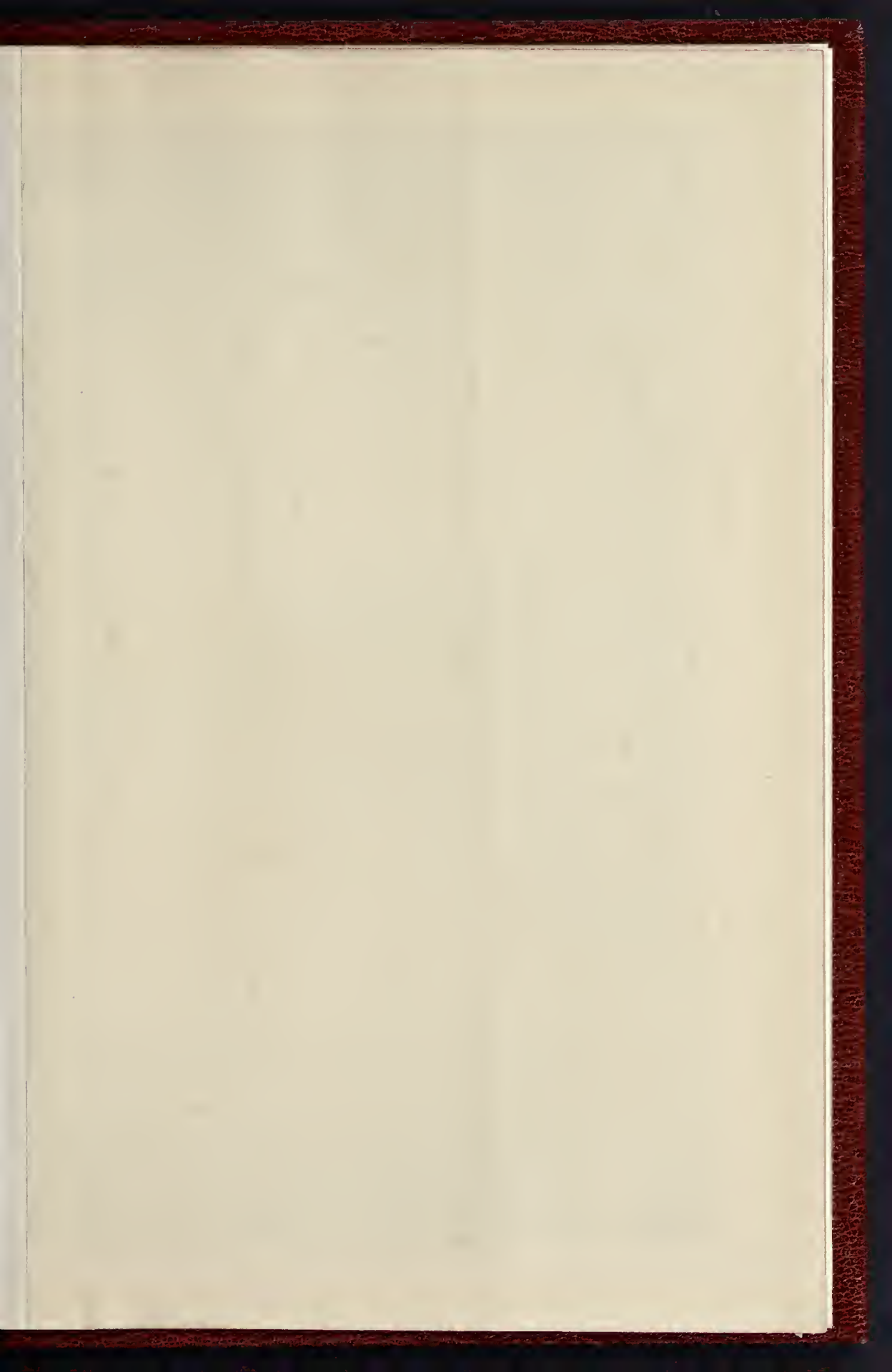
FOWEY HALL. CORNWALL.—M



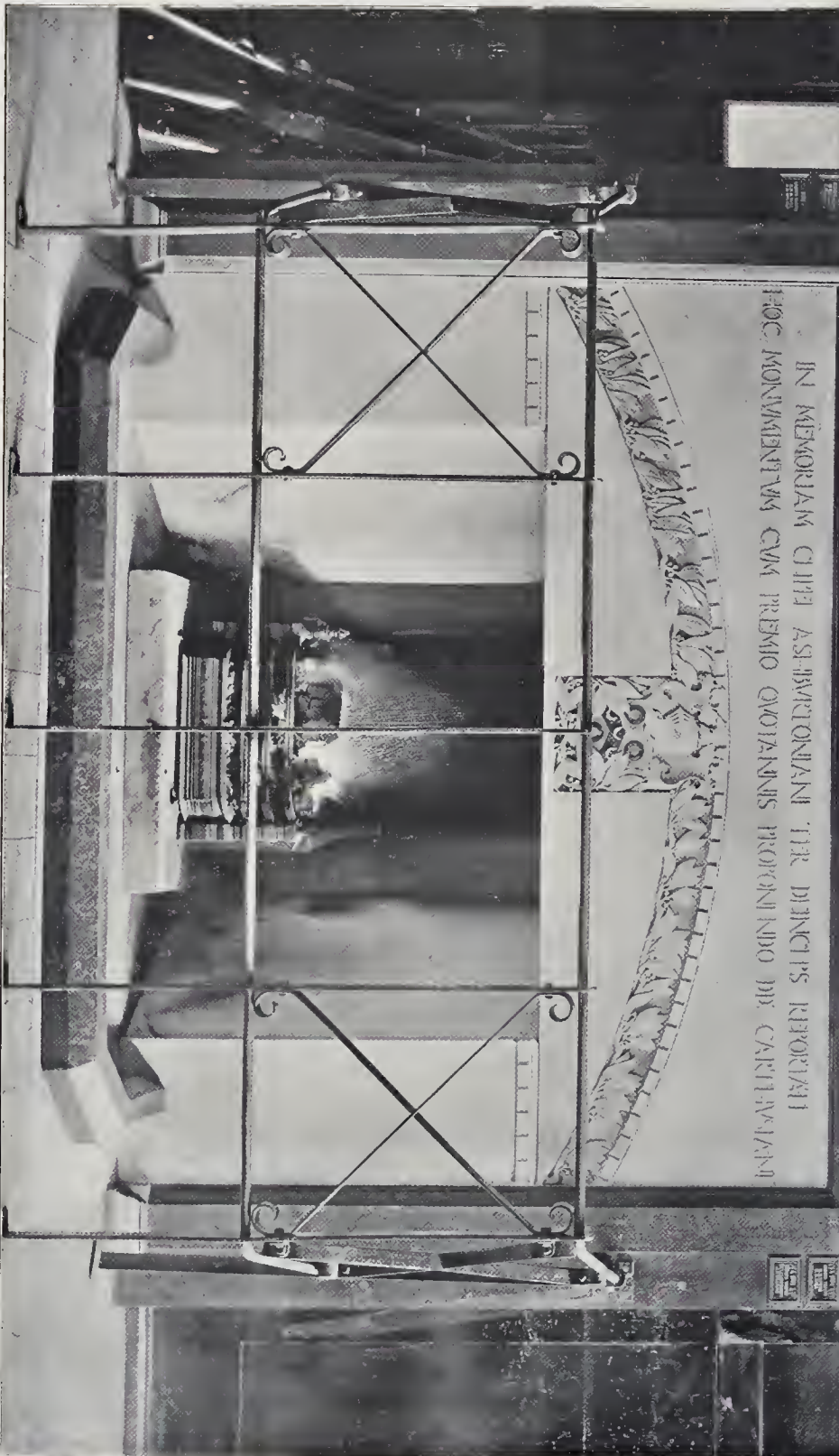
W. CURTIS GARDNER
1901

PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE C.C.



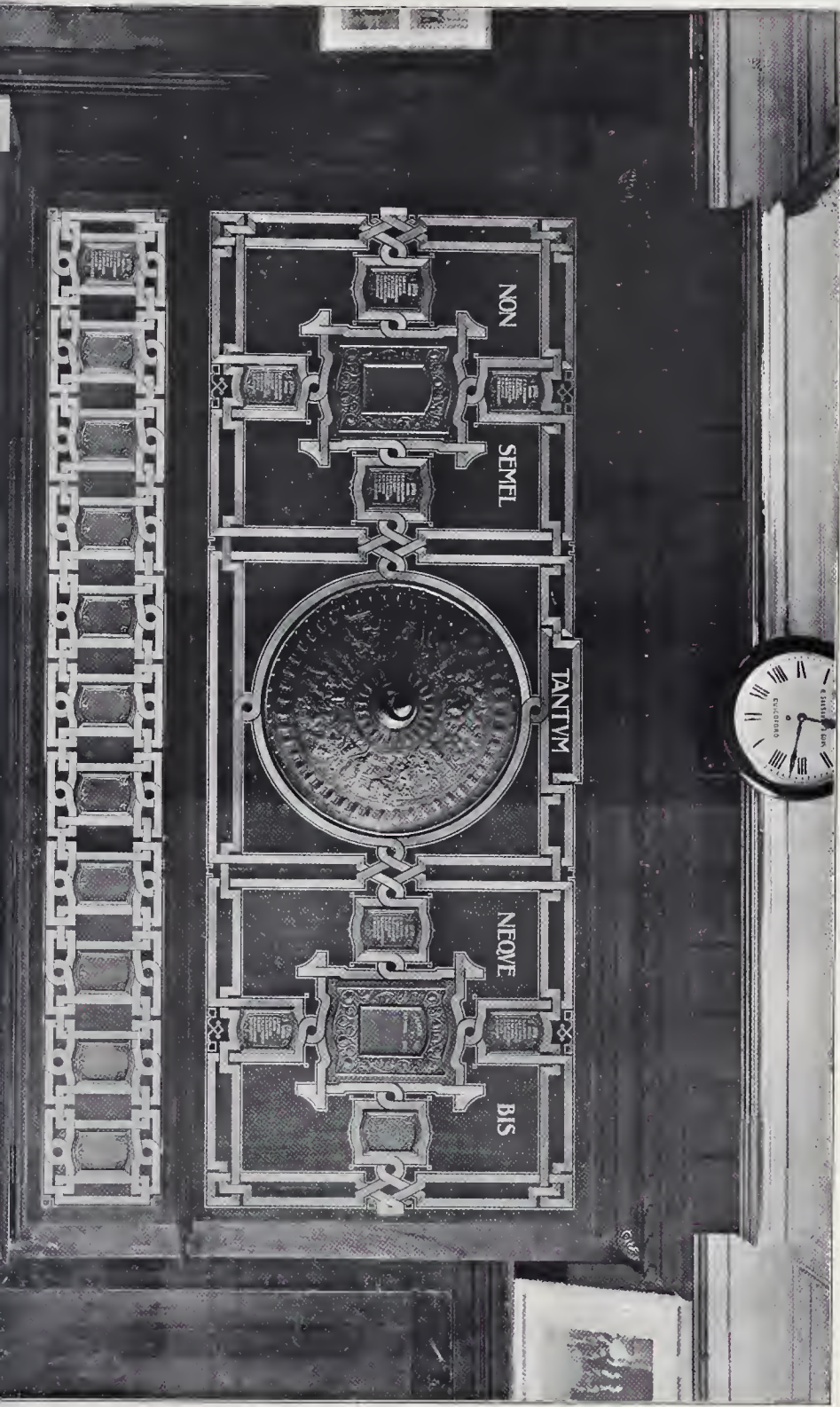


IN MEMORIAM GREG ASHBURTONANI TER DIGNITIS HONORARI
HOC MONUMENTVM CVM PREMIO QVOIANNIS HONORINIBO DIX CARITATIVIANI



ASHBURTON MONUMENT, CHARTERHOUSE SCHOOL.—MR. HOWARD INCE, ARCHITECT.

Spencer & Co., Ltd., Printers, 4, 5, & 6, Pall Mall, London, W.



THE BUILDER JUNE 29 1901



collection of prints and pictures as well as statistics. On the other hand are the Governmental insurance offices, such as those of Bavaria and Gotha, which show what they have done and are doing. Included in this section we may notice the contribution of the British Fire Prevention Committee, who show a model and plan of their testing-station, and photographs of some of the tests they have carried out.

ILLUSTRATIONS OF THE BIBLE.

THE attempt to illustrate scenes and personages in the Bible has been the occasion of the production of some of the greatest works in the art of painting. The mention of the subject at once recalls Michelangelo's sublime floating figure of the Creator on the ceiling of the Sistine Chapel, and his beautiful figure of Adam; Da Vinci's "Last Supper," and Raphael's cartoons and his picture of the Transfiguration. Painters of an earlier school, such as Orcagna and Signorelli, found a kind of fascination in the attempt to represent the solemnity and mystery of the Last Judgment, which also Michelangelo has represented in a manner more remarkable for vigour of execution than for solemnity or spirituality of conception. The subjects most often represented are perhaps the Nativity, the Crucifixion, and the Resurrection, and the second of these more especially, as embodying the central article of the Christian faith. Many other incidents both of Old and New Testament history have however, been made the subject of pictures by painters more or less eminent, and it would be possible to make a tolerably complete illustrated Bible from engravings or other reproductions of existing pictures. M. Tissot alone has produced a whole series illustrating the life of Christ, and a series of great and remarkable merit.

From time to time, however, there has been an endeavour to apply what may be called "book-illustration" to the Bible; illustrations made especially for publication in book form, bound up and interleaved with an edition of the Bible. There have been probably a great many more attempts of this kind than is generally known; illustrated Bibles which are long since out of print and become the treasures of collectors, and in which the naïveté of the illustrations would be too much for the reverential feelings even of children of the present day. There have been occasional attempts in modern times, however; of which the last one of importance, before the one which suggested these remarks, was that in which the illustration was confided to Gustave Doré, an artist of no sincerity or earnestness of aim or feeling, but who had ascertained that there was a large public in England for religious paintings, and made a fortune, or should have done, out of their credulity in taking him for a genius and a religious painter. To turn over the Doré Bible now is only to feel a kind of stupefaction over the fact that such commonplace and clap-trap illustrations as these should ever have been seriously accepted by accredited art-critics (as they certainly were) as an important contribution to the illustration of the Bible. The Doré Bible may still possibly find acceptance in the homes of the poorer and less educated classes, but for any others it is worthless.

Nevertheless, bad as these illustrations are, we are inclined to think that the system was the right one, of putting the illustrations to a whole edition of the Bible into the hands of one artist, provided that the right man were found. For it is only on this system that we can have a publication which is consistent and homogeneous in character, as an illustrated book. That success is possible in this way is proved by such a work as Flaxman's illustrations to the "Iliad" and the "Odyssey," and in a lesser sense by those to the "Divina Commedia," which are only inferior in so far as Flaxman's genius was more in sympathy with classic than with mediæval subjects. If it is difficult to find a single artist adequate to the task of illustrating the whole Bible and willing to undertake it, the next best thing would be to classify the subjects, giving a particular section to each artist—one undertaking to illustrate the Pentateuch, another the Prophets, another the Gospels and Acts of the Apostles, and so on. There would then at least be a unity of treatment in regard to each of the main sections of the Bible.

It is the want of any such scheme as this which is the weak point of the new illustrated *édition de luxe* of the Bible, the original drawings for which are on view at the Holland Fine Art Gallery in Grafton-street. Not only has there been no attempt at securing consistency of treatment, but the promoters of the work appear to have purposely aimed at a kind of popular *tour de force* in securing the assistance of leading artists of all countries and all (modern) styles, who seem to have been engaged simply for their names, without the slightest consideration of their inherent fitness for the treatment of sacred subjects. The result is the most extraordinary medley of drawings in all kinds of different styles and different methods of execution; and what is a more serious discrepancy, there is no common ground among them as to the spirit in which the scenes are to be treated. Some are realistic and modernising, and what may be called "anecdotal" in conception; others are more or less conventional, religious, or symbolical. What kind of common ground in illustration can be occupied, for instance, by Mr. Walter Crane, Herr Von Uhde, and M. Rochegrosse? The very collocation of the names sounds absurd. Mr. J. M. Swan is no doubt useful when it comes to illustrating Daniel in the lion's den, otherwise it is difficult to understand how he came to be thought of as a Bible illustrator, any more than M. Rochegrosse, whose reputation has been made in a class of work about as little associated with religion or spirituality as can be. Herr Von Uhde is a thoughtful painter who has seriously given himself to the study of the life of Christ and the endeavour to realise it in art; we do not always agree with his views, but he is at all events an earnest student of the subject. But he is evidently selected not on that account, but merely to represent one more school and nationality in the list. The promoters have not in fact been aiming at an adequately and seriously illustrated Bible, but at the production of a volume which shall show as great a variety of artists as possible for the money. That is not the spirit in which to do it.

Among the drawings exhibited those of M. Gérôme take the first place. They are all well-conceived and seriously-treated compositions, combining dignity of style

with a great deal of dramatic force and character; and he has not made the mistake of aiming at too piquant a realism, or treating Bible-scenes in an ultra-modern style. Signor Michetti's "Saul on the way to Damascus" after seeing the heavenly vision, is an example of what we mean; Saul is represented grovelling on the ground with his mouth wide open in a paroxysm of terror. This may be realism, but it is a realism degrading to the subject. This treatment of the Bible in a *genre* spirit seems the besetting sin of the Italian contributors; Signor Morelli's "Prodigal Son" is another example; it reduces the beautiful incident of the reception of the prodigal by his father to sheer commonplace; and the "Song of Solomon" is illustrated by a scene in a suburban garden. Herr Max Liebermann is pathetic in his picture of Job and his friends, but how far inferior to the spiritualised pathos of Blake's illustration of the same scene. Mr. Abbey's angels, and his Deborah singing her song of triumph, are wholly deficient in dignity; the only case in which he rises to the height of his subject is in the figure of "Christ Standing at the Door," which is really fine; and he has given a forcible conception of Jael after killing Sisera, representing her as what she must have been, a vigorous but coarse personality, with none of the tenderness of woman about her. M. Benjamin-Constant is somewhat theatrical in his effects, but not without dignity, and his "Christ Raising Lazarus" is a fine composition. M. J. P. Laurens's "Jephthah's Daughter" and "Ruth and Boaz" are finely composed pictures; Herr Kampf, in his picture of "Christ Riding into Jerusalem," has given one of the most disagreeable conceptions of Christ that we have ever seen; he suggests a personage in one of Mr. Gissing's novels rather than the Saviour of the world. Other German contributors have appreciated their subjects better: Herr Von Uhde, to whose work one naturally looks with interest—his scene where Abraham embraces Isaac in a rapture of paternal affection on receiving the command to spare him, is truly fine and pathetic; and Herr Vriendt, in "Jesus blessing little children," has combined realism with tenderness. In "The Angel appearing to the Shepherds" Herr Edelfelt has given us the only angel figure in the collection which is expressive of the beauty and love which one might imagine to characterise an angel ministering to human beings. Most of the angels in the pictures are commonplace; some are positively ugly. One of the finest and most poetic of all the illustrations is furnished by Mr. Briton Riviere; about the last person, from our general knowledge of his pictures, to whom one would have attributed this fine conception of the subject, "The Spirit of God moved upon the face of the waters." It is a shoreless expanse of water with a half suggestion of a bright presence in the distance, whose light is partially reflected in the water. This is a conception quite in the spirit of Milton.

The whole collection, in an artistic point of view, is exceedingly interesting, and well worth a visit; the variety of style and treatment increases its interest as a temporary exhibition. It is as a set of permanent illustrations for a single edition of the Bible that we think it defective, from want of any fixed or dominant aim in the whole, and (in many cases) a lack of dignity of conception and elevation of style in dealing with sacred subjects.

NOTES.

The New Government Offices. IN our last issue we recorded the reply of the First Commissioner of Works to a question asked in the House of Commons as to what course was to be taken in carrying out the War Office and the Government Offices in Great George-street, both the architects of which have unhappily died before their buildings were commenced. The War Office, as our readers are aware, is to be carried out by Mr. Young's son, in conjunction with Sir John Taylor, and the reply was given to that effect. The reply with regard to the building in Great George-street was less reassuring; it was to the effect that "the completed plans and drawings are in the hands of the Office of Works, and can be carried out either by the Department's architects or by an architect specially selected for the purpose." We hear, with consternation, that the Treasury (in the true spirit of the English Government in dealing with works of art) wish to save a special architect's fee by having the building carried out by the Office of Works. Such a proposal ought to be strenuously resisted. The detailing of a design is often the most important part of the architect's work in regard to its final effect in execution; and it would be especially so in the case of Mr. Brydon's design, which was not marked by any great or startling originality of general conception, and would depend for its effect very much upon the careful treatment of the detail, a matter to which Mr. Brydon always gave the greatest attention in carrying out his buildings. If the building is allowed to be carried out by the Office of Works Department, it will infallibly be spoiled. An architect of eminence, and experienced in classical detail, ought to be appointed to carry out the work, not only in justice to the late Mr. Brydon, but in justice to the public, whose money is being spent upon the building.

The Safety of St. Paul's. It has lately been suggested by Mr. W. Emerson, in a letter to the *Times*, that the vibration that may be expected to follow the working of the City and Piccadilly railway will possibly affect the future stability of St. Paul's Cathedral. Coming as it does from the President of the Royal Institute of British Architects, this proposition is not one to be dismissed lightly, and it will no doubt receive due consideration at the proper time. The author of the suggestion says "there would be in all probability a very real danger were this Bill passed," having apparently arrived at this conclusion in consequence of a statement by Wren relative to the injurious effects of incessant vibration. We all know Wren as an undoubted authority on St. Paul's, but his opportunities for studying the effects of long continued vibration could never have been equal to those open to architects and engineers of the present day. We should, therefore, much prefer to hear the views of living experts upon the very important point in question. Since the advent of ordinary railways and of heavy vehicular traffic in the midst of great cities thousands of buildings of every kind have been subjected to incessant vibration, probably of a more trying nature than that set up by low-level railways. Yet we have heard very little to confirm the evil prognostications of Wren. The possibility of damage to St.

Paul's must certainly be considered in the most searching manner, and from every point of view, in the light of latter-day knowledge and experience. If the slightest risk of injury to such a building should appear to be likely to result from the construction of the railway along the proposed route, then we heartily agree that "the voice of the public should be raised in conjunction with that of the Dean and Chapter in the most strenuous opposition to any such enterprise."

The Right of Foreign Workmen for Personal Injuries. It is a constant source of surprise that so many legal points which one would suppose had long ago been settled keep arising again. One of these was decided last week in the King's Bench Division—namely, whether the representative of a deceased foreigner is entitled to bring an action in this country under Lord Campbell's Act. In these days, when a good many foreigners are to be found engaged in various operations—such, for example, as in laying down asphalt—this point has a good deal of practical importance. The two Judges decided that the Act was intended to give to foreigners the same remedies as to Englishmen, thus differing from the single decision of Mr. Justice Darling in a previous case. It would certainly be very inequitable for two workmen—one English and one a foreigner—to be fatally injured when working for one employer, and for the widow of the one to be entitled to compensation and not the widow of the other. Of course, as regards personal injuries which are not fatal, the point does not arise, since the remedy under these circumstances arises from the general law and not from a particular statute.

Railway Charges for Goods Traffic. SEVERAL of the principal railway companies are giving notice of a reform in procedure which has long been in contemplation, but which will, perhaps, be regarded as somewhat drastic. They will decline to accept a reference to the sender for carriage of goods not consigned "carriage paid," and will, presumably, withhold delivery of the goods pending settlement. Of course, the liability for carriage can, and should be, clearly understood and arranged between buyer and seller in any ordinary transaction, and when the carriage should be prepaid, the goods should always be so consigned. Where the trouble will arise will be in the case of returned goods and articles sent for repairs, for the carriage of which the receiver is not responsible, but which, nevertheless, are frequently tendered to him "carriage to pay." The railway companies always have many items of this nature in dispute, which neither party will pay if they can possibly help it, and these cases entail an immense amount of clerical labour before they are settled. Even in those cases where the sender, on being referred to, pays up without demur, a great deal of extra book-keeping and correspondence is involved. Various facilities have been withdrawn by the railway companies recently, a considerable amount of friction being thereby occasioned; but while a too rigid application of the new rule might prove a mistake, and would certainly cause more trouble, the proposal can hardly be regarded as unreasonable.

The Virginia Disaster. FROM the later accounts given of this lamentable occurrence, it is clear that the original despatch was not precisely accurate in attributing the disaster to the failure of the Pocohantas dam, although it is true that the violence of the flood was materially augmented by that untoward event. In the mountainous region on the borders of West Virginia and Virginia States a continuous rainfall of thirty hours is quite sufficient to account for widespread damage. Such a result might naturally be expected in a narrow defile like the Elkhorn Valley, varying from a quarter of a mile to one mile in width, and extending for many miles with mountains on either side, from which numerous streams bring down the waters that recently transformed the populous valley into a raging and destroying flood. The storm of rain culminated in a cloudburst, and the immense volume of water liberated appears to have entirely overcome the resistance offered by the Pocohantas dam, thus releasing a further quantity of water, which swept down in the middle of the night upon the towns and cities of the doomed valley. Details of the construction adopted in the case of this particular dam will no doubt be furnished in due course by the American technical press. Criticism of American dams has not been invariably favourable in this country, but at the present moment there is no definite reason for assuming deficient strength. The utmost ingenuity of man must sometimes be at fault, and there is no factor of safety capable of providing security against the illimitable forces of nature.

Standardisation of Steel Sections. OUR readers will doubtless learn with some interest that a committee has recently been appointed by the Institution of Civil Engineers, with the co-operation of the Institution of Mechanical Engineers, the Institution of Naval Architects, and the Iron and Steel Institute, to consider the advisability of standardising the various sections of iron and steel, and if found advisable, to consider and report as to the steps that should be taken to carry such a standardisation into practice. It seems an altogether superfluous task for a committee to sit down and solemnly to discuss the advisability of standardisation; but this part of the programme has possibly been inserted with the object of showing that the committee will approach the subject without any limitations on their discretion. Amongst the names of gentlemen appointed to serve we notice well-known representatives of bridge, harbour, railway, shipbuilding, and mechanical engineering, whilst metallurgy and experimental science are duly recognised. Work has already been commenced by the taking of evidence offered by engineers, manufacturers, and contractors upon the subject indicated. Standardisation is the order of the day in every branch of manufacture, but it is by no means so generally obeyed as it ought to be. Those who wish to see the additional prosperity of British engineering work, and the more universal adoption of British steel sections, will welcome the practical realisation of methods calculated to facilitate constructional work and the economical production of the material used therein. We hope the attention about to be directed to the subject will have the effect of bringing to a proper state of mind those

PRICES CURRENT (Continued).

PRICES CURRENT (Continued).

PRICES CURRENT (Continued).

STONE. Dacyle Dale in blocks... Red Corshill... Best Mansfield... Hard York in blocks... Hard York 6 in. sawn both sides landings... 6 in. Rubbed Ditto... 3 in. sawn both sides slabs... Hupton Wood (Hard Bed) in blocks... 6 in. sawn both sides landings... 3 in. do.

SLATES. 20x10 best blue Bangor... 20x10 best second... 20x10 best blue Portmadoc... 20x10 best blue Portmadoc... 20x10 best blue Portmadoc... 20x10 Permanent green... 20x10 Permanent green...

TILES. Best plain red roofing tiles... Best Broseley tiles... Best Rulon Red, brown or... Best Do. ornamental Do... Best Red or Mottled Staffordshire Do... Best Hip tiles... Best Valley tiles...

WOOD. BUILDING WOOD—YELLOW. Deals: best 3 in. by 11 in. and 1 in. by 9 in. and 11 in. Deals: best 3 by 9... Battens: best 2 in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in. Battens: best 2 1/2 by 2 and 3 by 6... Deals seconds... Fir timber: Best middling Darnig or Mennel (average specification)...

JOINERS' WOOD. White Sea: First yellow deals, 3 in. by 11 in. and 1 in. by 9 in. Battens, 2 1/2 in. and 3 in. by 7 in. Second yellow deals, 3 in. by 11 in. Battens, 2 1/2 in. and 3 in. by 7 in. Third yellow deals, 3 in. by 11 in. Battens, 2 1/2 in. and 3 in. by 7 in. Petersburg: first yellow deals, 3 in. by 11 in. Battens, 2 1/2 in. by 9 in. Second yellow deals, 3 in. by 11 in. Battens, 2 1/2 in. by 9 in. Third yellow deals, 3 in. by 11 in. Large, regular sizes... Oddments... Second, regular sizes... Yellow Pine... Kauri Pine... Danzig and Stettin Oak Logs... Wainscot Oak Logs... Dry Wainscot Oak... Dry Mabogany... Honduras, Tabasco, per ft. sup. as inch... Selected, Figury, per ft. sup. as inch... Dry Walnut, American, per ft. sup. as inch...

WOOD. Teak, per load... American Whitewood Planks... Prepared Flooring... 1 in. by 6 in. and 7 in. yellow, planed and shot... 1 1/2 in. by 6 in. and 7 in. yellow, planed and shot... 1 in. by 6 in. and 7 in. white, planed and shot... 1 in. by 6 in. and 7 in. white, planed and shot... 1 1/2 in. by 6 in. and 7 in. white, planed and shot...

JOISTS, GIRDERS, &c. Rolled Steel Joists, ordinary sections... Compound Girders... I-beams, Tees and Channels, ordinary sections... Flitch Plates... Cast Iron Columns and Stanchions, including ordinary patterns...

METALS. Iron—Common Bars... Staffordshire Crown Bars, good merchant quality... Steel Iron, Black, Galvanised, flat, ordinary quality... Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g... Galvanised Corrugated Sheets... Best Soft Steel Sheets, 6 ft. by 4 ft. Cut nails, 3 in. to 16 in. (Under 3 in. usual trade extras.)

PLASTER, &c. Coarse Plaster... Fine... Cement... Fine do. do. Robinson's Fireproof Cement... Whiting... LEAD, &c. LEAD—Sheet, English, 3 lbs. & up. Pipe in coils... Zinc—Sheet... Silesian... COPPER—Strong Sheet... Brass—Strong Sheet... Tin... TIN—English Ingots... SOLDER—Plumbers'... Blowpipe...

ENGLISH SHEET GLASS IN CRATES. 15 oz. thirds... 21 oz. thirds... 26 oz. thirds... 32 oz. thirds... Fluted sheet, 15 oz. 1/2... 1/2 Hartley's Rolled Plate...

OILS, &c. Raw Lined Oil in pipes... Baled... Turpentine, in barrels... Genuine Ground English White Lead... Red Lead, Dry... Best Lined Oil Putty... Stockholm Tar...

VARNISHES, &c. Fine Elastic Copal Varnish for outside work... Best Elastic Copal Varnish for outside work... Best Elastic Carriage Varnish for outside work... Best Hard Oak Varnish for inside work... Best Extra Hard Church Oak Varnish for inside work... Fine Hard Copal Varnish for inside work... Best Hard Copal Varnish for inside work... Best Hard Copal Varnish for inside work... Extra Pale Paper Varnish... Best Japan Gold Size... Best Black Japan... Oak and Mahogany Stain... Brunswick Black... Berlin Black... Knotting... Best French and Brush Polish...

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Any commission to a contributor to write an article is given subject to the approval of the editor, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. All communications, regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS. [Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot or the building-owner; and we cannot publish announcements of any tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.] * Denotes accepted. † Denotes provisionally accepted.

ABINGDON.—For additions to Roysess School, for the Governors. Mr. J. G. T. West, architect, The Knowl, Abingdon.— Bloxham... Oxford Co-operative... Lindsay Jones... Kinperlee... Wheeler... Colbourne... 5,826

DERBY.—For additions to school, Killburne, for the Manager of the Killburne Elementary School, Mr. P. H. Currey, architect, Market-place, Derby. Quantities by the architect:— The Derby Bull... W. Salt... Crookes, Kilburne... Harris & Hunt... 235 9 8

DRIFFIELD.—For new houses and shops. Mr. Joseph Shepherdson, architect, Driffield and Bridlington.— Brickwork, Stonework, Slating, and Plastering. Moses Gage, Driffield... £897 10... Carpentry and Joinery. W. R. Bishop, Driffield... 667 4 10

DRIFFIELD.—New stabling for Mr. J. Read, Mr. Joseph Shepherdson, architect, Driffield and Bridlington.— hos. Rudd... £258 15 A. H. Berry, Nafferton... 247 17 1/2 Lesson... £213 0

EAST MOLESEY.—For new police-station at East Molesey, for the Metropolitan Police.— Credit for Old Material. T. Parker... £4,498... Holloway Bros... £120... C. Ansell... 4,480... Higgs & Hill... 100... O. Craske... 4,384... S. Hart... 4,395... Gage & Sons... 4,159... Messon & Sons... 4,075... Martin, Wells, & Co... 4,079... Geo. Challis... 4,044... Oldridge & Sons... 3,994... E. Patterson... 3,780

ULDFORD.—For alterations to Braboeuf Manor, for Mr. William G. Lower, architect, Guildford.— app... £685 10 Mitchell Bros... 665 0 Sbalford... £595 16

EBDEN BRIDGE (Yorks).—For the erection of city-substation, for the County Borough Council of Easington (Tramways and Electricity Committee), Mr. J. A.M. Inst. C.E., Town Hall, Halifax.— Masonry—Thomas Pickles, Luddenhall... £451 14 5 1/2... John Kershaw, Mytholmestoyne... 130 11 0... Fred Alderson, Healden Bridge... 56 8 5... Lumsden & Plastering... 52 12 0... John Berry, Halifax... 37 17 0

(See also next page)

HENFIELD (Sussex).—For the erection of a police station, for the West Sussex County Council. Mr. W. B. Purser, C. E., 4, Worthing-road, Horsham. Quantities by Mr. C. H. Burrow, West-street, Horsham:—
 J. J. Pichard £1,491 16 7 Rowland Bros. £1,150 0 0
 H. Murrell .. 1,257 3 1 Geo. Roberts 1,130 0 0
 W. Wallis .. 1,210 15 3 Cook & Sons .. 1,066 0 0
 Hall & Redford 1,134 13 2 Lindfield & Son, Horsham .. 1,025 0 0
 Brown & Son 1,179 0 0

LAMPETER (Wales).—For the erection of school buildings, for the School Board. Mr. L. Banks Price, architect, Lampeter:—
 W. Barnes .. £1,780 Lewis Davies, Lampeter .. £1,670
 J. & W. Jones .. 1,750

LANGTOFT.—For alterations to schools. Mr. Joseph Shepherdson, architect, Driffield and Bridlington:—
 W. Barnes .. £316 0 J. Sawden, Bridlington .. £26
 Barr & Booth .. 301 0
 W. Sutton .. 277 10

LEEDS.—For the erection of a tenting house, Waterloo Mills, Pudsey, for the Waterloo Mill Company. Mr. C. S. Nelson, architect, 15, Park-row, Leeds:—
 Masonry and Bricklaying.—Thompson & Lewis, 48, Wellington-street, Laister Dyke, Bradford.
 Joinery.—E. Hulton & Son, Fulneck, Pudsey.
 Plumbing.—J. Scarth, Pudsey.
 Slating.—F. Thompson, Slaughtingley.*
 Total .. £393 18s. 3d.

LONDON.—For extension of Board-room, erection of a new Committee-room, and sundry other matters at the Union Offices, St. John's Hill, S.W., for the Guardians of the Wandsworth and Clapham Union. Messrs. Lansell & Harrison, architects, 38, Bow-lane, Cheapside, E.C. Quantities by Mr. B. W. Swinestead, 23, Wellington-street, Strand, W.C.:—
 Martin, Wells, & Co. £3,070 W. Wallis .. £2,403
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 H. L. Holloway .. 2,780 J. Christie .. 2,380
 Lole & Lightfoot .. 2,700 W. Keys .. 2,350
 W. J. Renshaw .. 2,598 S. Dockerill .. 2,286
 Spiers & Son .. 2,429 Wilson Bros. & Lamplough, Kensal-rise* 2,241
 R. A. Jewel .. 2,428

LONDONDERRY.—For the erection of two houses, Castle-avenue, Buncrana, for Mr. Patrick Campbell. Mr. T. Johnston, architect, 11, East Wall, Londonderry:—
 J. A. Fulton .. £525 H. Campbell, Buncrana, co. Donegal* £380
 J. J. Maulston .. 500
 D. Doherty .. 435
 R. Colhoun .. 400
 Sitt & Co. .. 380

PAIGNTON.—For new retort house and coal store for the Paignton Gas Company. Mr. C. G. Dawson, engineer, Paignton. Quantities by Mr. Vincent Cattermole, Brown, Paignton:—
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 Webber & Sons .. 1,078 10 Dart & Pollard .. 928 10
 E. Westlake .. 1,049 0 Herbert Drew* .. 884 0
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 John Phillips 786 13 6 H. Sparrow .. 720 0 0
 T. Wt. .. 779 10 0 T. Swindall .. 719 0 0
 Hack Bros. 759 0 0

RUDEN.—For the erection of five cottages on the Wellio-road, Rushden, for Messrs. Knight & Bradfield. Mr. H. Knight, architect, Rushden. Quantities by architect:—
 A. G. .. £1,225 4 0 C. E. Bayes .. £1,032 10 0
 Had Bros. 1,049 0 0 T. Willmott .. 1,000 0 0
 H. Sw .. 1,046 9 5 Johnson & Phillips .. 980 0 0
 T. .. 1,045 0 0 T. Swindall .. 879 0 0
 E. Nell .. 1,039 10 0 W. Packwood 892 0 0

STFORD.—For decorations, &c., at the King's Head West Ham-lane, for Mr. J. Offwood. Mr. J. I. Gladwell, architect, 34, Laurence-road, Bow, E.:—
 A. V. .. £178 0 E. Van, Jones, & Co. .. £143 15
 A. James .. 147 0

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 In & Son .. 3,173 0 Drowley & Co. .. 2,874 0
 H. R. Son .. 3,700 0 G. Allard .. 2,676 0
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 .. 3,495 0 F. J. Kemp .. 2,607 0
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